Financing Decisions and Financial Constraints: Evidence from the UK and China

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ABSTRACT

Firms are the engines of growth in any economy. It is therefore important to study how they finance themselves, as this may have a direct impact on the overall growth rate of the economy. A firm can choose whether to finance its activities with equity, debt, or both. An optimal capital structure is that mix of internal and external finance (debt and/or equity) that optimizes the value of a firm. Therefore, the question of how to finance or equivalently from where to borrow becomes a crucial decision.

In each chapter of this study, we study the financing decisions of a different set of firms faced with financial constraints. The two countries we focus on are the UK and China. Our study examines two types of firms in the UK. We first study listed firms and examine how financial constraints affect their leverage decisions. Next, we focus on the financing decisions of small and medium-sized enterprises (SMEs), as these firms are more likely to suffer from financial constraints. To examine financial constraints, we use both conventionally used indicators of financial constraints and new indicators.

Our study on China is mainly based on listed manufacturing Chinese firms. China is currently the largest developing and transition economy in the world. It is interesting to study the financing behaviour of manufacturing firms in China as manufacturing is believed to be the main engine behind the Chinese growth miracle. We account for factors specific to the Chinese case to determine if the leverage decisions of Chinese firms are similar to those of firms in other parts of the world. We also examine the cash holding decisions of Chinese firms as these firms seem to be highly financially conservative.

Our results indicate that firms tend to follow a financial hierarchy in their financing patters and that the preferred source of external finance of most firms, whether in the UK or China, remains leverage. However firms tend to reduce their leverage when they experience an increase in their internal funds, which points towards a financially conservative behaviour. This needs to be accounted for in policy decisions that are mainly formulated on the supply side.

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TABLE OF CONTENTS

FINANCING DECISIONS AND FINANCIAL CONSTRAINTS: EVIDENCE FROM THE UK AND CHINA

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ABC	Agricultural Bank of China
BOC	Bank of China
BOCOM	Bank of Communications
CBRC	China Banking and Regulatory Commission
CCB	China Construction Bank
CCFR	Centre for China Financial Research
CEO	Chief Executive Officer
DTI	Department of Trade and Industry
FAME	Financial Analysis Made Easy
ICBC	Industrial and Commercial Bank of China
PBC	People's Bank of China
PCBC	People's Construction Bank of China
POT	Pecking Order Theory
RCCs	Rural Credit Coorperatives
SBS	Small Business Service
SHSE	Shanghai Stock Exchange
SOBs	State Owned Banks
SOEs	State Owned Entreprises
SZSE	Shenzhen Stock Exchange
TOT	Trade off Theory
UCCs	Urban Credit Coorperatives
WTO	World Trade Organisation

CHAPTER 1

FINANCING DECISIONS AND FINANCIAL CONSTRAINTS: EVIDENCE FROM THE UK AND CHINA

1.0 INTRODUCTION

Many factors are believed to influence the capital structure decisions of firms. Most studies on capital structure have been based on firms in the US and have concentrated mainly on firms that are quoted on the stock market. The main reason for this is easy data availability. Very few studies have examined the capital structure of firms in other countries. The primary aim of this study is to analyse the capital structure of firms in the UK and China by taking into account financial constraints that firms in these countries might face. Specifically, we will examine how internal finance affects the leverage decisions of firms.

The first part of this study consists in examining the capital structure of quoted firms in the UK. It should be noted that most capital structure theories have been developed to explain the capital structure of large firms and the question whether these capital structure theories apply to small and medium-sized firms (SMEs) is still a puzzle. The second part of this study therefore investigates if capital structure theories are relevant to SMEs in the UK. We also study if quoted firms and SMEs in the UK have the same financing behaviour. This results in a direct comparison of quoted and unquoted firms especially when financial constraints are taken into account.

The third aspect of this study consists in studying the capital structure of listed Chinese firms. As is well-known, China is currently the largest transition economy, having one of the highest growth rates in the world. China has unique features. For instance, most of the Chinese firms listed on the stock market were previously state-owned enterprises and even now the state exercises controlling rights in these firms. Although China has a poorly developed financial system, most studies have found that Chinese firms use a lot of external finance where short-term debt is the dominating form of debt. Therefore, the third purpose of this study is to investigate the extent to

which the capital structure of Chinese firms is similar to the capital structure of firms in the UK.

Our main contribution to the literature is mainly empirical. We study the financing behaviour of firms in countries which have not been highly researched namely the UK and China. We study two very different financial systems, the UK having a very well-developed and mature financial system, while China is a developing transition economy with the prospects of becoming one of the most influential players in the world. Most research on financing and financial constraints has mainly focussed on firms in the US. We study the UK and China as this provides an interesting comparison and goes off the beaten track.

As stated by Hutton (2006) China is the new factor in global politics and economics. By focussing a major part of this study on the financing decisions of Chinese firms, this study gives a new dimension to research in this area. Empirical research on China is a very challenging task especially as data availability is a serious issue. The availability of good quality financial data enables us to examine the leverage and cash holding decisions of these firms and provides some understanding about how firms in the fastest developing and transition economy in the world make their financing decisions.

Our second contribution to the literature is that we examine leverage behaviour of firms faced with financial constraints and therefore merge two different strands of literature namely the literature on capital structure and the literature of the effect of financial constraints on firm behaviour. Prior literature has mainly concentrated on the effects of financial constraints on the investment decisions of firms. Financial constraints are also quite important in leverage decisions as is demonstrated in this study.

We also examine the cash holding decisions of listed Chinese manufacturing firms. Chinese firms are among the biggest savers in the Chinese economy and it is interesting to study the factors that lead these firms to hold vast amounts of cash. We investigate the factors that affect the cash holdings of Chinese firms and examine the reasons why Chinese firms have accumulated large reserves of cash. We study the cash holding decisions of these firms by taking into account the financial constraints that these firms might face and also take into account events such as WTO accession.

1.1 BACKGROUND

Firms are the engines of growth in any economy. It is therefore important to study how firms finance themselves as this has a direct impact on the overall growth rate of the economy. A firm can choose whether to finance its activities with internally generated funds, debt, equity or a combination of these. The various means of financing represent the financial structure of an enterprise. According to Modigliani and Miller (1958), capital structure is irrelevant in the sense that internal and external finance can be regarded as perfect substitutes. Therefore it does not matter whether investment is financed by debt, equity or internal funds.

One important and rather unrealistic assumption of the Modigliani and Miller theorem is that capital markets are perfect and thus firms have unrestricted access to funds. Another rather unrealistic assumption is that they consider that all firms are homogenous. Due to these unrealistic assumptions, there is growing awareness among economists and researchers alike that capital markets are characterised by market imperfections, namely asymmetric information and that firms are definitely not homogeneous.

Once we move away from a model of perfect capital markets, capital structure becomes relevant and how investment is financed becomes a crucial decision. Hence the alternative view that firms are heterogeneous and that internal and external finance may not be perfect substitutes triggered research into finding whether capital market imperfections affect investment decisions.

Previous studies of capital structure have mainly investigated how firms choose between equity and debt as their main source of financing (Marsh, 1982; Jalilvand and Harris, 1984). However, by concentrating on these sources of financing, an important source of finance that has been sidelined is internal funds. Prior to the development of the pecking order model, previous studies have tended to generalise that firms would use internal finance only when they cannot have access to external sources of funds mainly leverage and equity (Fazzari, Hubbard and Petersen, 1988, henceforth FHP, 1988). However, this does not explain why even listed, established and mature firms tend to rely a lot on internal finance.

An alternative theory that has gained recognition in the wake of the Modigliani and Miller theorem is the Pecking Order Theory proposed by Myers (1984) and Myers and Majluf (1984). According to the Pecking Order Model, there is a strict ordering or hierarchy of sources finance. Firms always seem to prefer internal sources of finance followed by debt and then, when such sources are exhausted, equity finance is used. This is because internal and external finance are not perfect substitutes as internal finance is believed to be the cheapest source of finance. The availability of internal funds allows firms to undertake investment without having to resort to external finance which is relatively more expensive due to transaction costs, tax advantages, agency problems, costs of financial distress and asymmetric information (FHP, 1988).

Asymmetric information increases the cost of debt but, on the other hand, tax advantages have an opposing effect which reduces the cost of debt relative to equity issues (Benito 2003). The most expensive source of finance is believed to be equity finance due to the various costs associated with new equity issues such as underwriting discounts, registration fees, taxes, and selling and administrative expenses. Support for the Pecking Order Model comes from the fact that most listed companies seldom make net new equity issues (Benito, 2003).

Firms are characterised by heterogeneity. Some firms are listed on the stock market and have access to capital markets. These are the firms that are also less likely to face problems of asymmetric information. Hence, these firms that more likely to secure bank loans to finance their investment. Thus against all expectations, it may be the case that listed firms rely a lot on bank loans to finance their investment. The belief that listed firms are market-dependent while non-listed firms are bank-dependent may therefore be erroneous, as there are numerous costs associated with equity issues as mentioned above, that may make debt-finance, namely in the form of bank loans more attractive.

Some studies have tried to show that a bank lending channel is operating in the UK despite the fact that the UK is classified as a market- based system (Benito, 2003; Huang, 2003). Evidence can be found in Huang (2003) of whether tight money reduces bank loan supplies to firms in the UK. In particular, his findings suggest that tight money reduces bank-loan supplies to non-listed companies and increases bank-loan supplies to public companies. But when monetary policy becomes tight enough even bank-dependent public companies start suffering from losses in bank-loans.

Furthermore as mentioned by Benito (2003), a feature of market-based systems such as the UK is greater availability and use of new equity finance. However, for the Pecking Order Model to hold it should be borrowing and not equity issues which should respond to increased need for finance.

In a study of financial systems and financial structures by Demirgüç-Kunt and Levine (1999), the UK is classified as a market-based system, where markets play a more dynamic role, and it is believed that firms rely a lot on markets to get funds for investment[1]. But it has been found that the majority of firms do not issue equity. Only a substantial minority of companies undertake new equity issues (Benito, 2003). This supports the notion that a majority of quoted companies do not issue equity after the initial public offering and that firms rely on other sources to get funds for investment. A number of studies have shown that compared to other countries, UK firms face higher financing constraints compared to, for instance, Germany, which is a bank-based system (Bond, Harhoff and Reenen, 1999; Bond, Elston, Mairesse and Mulkay, 2003).

1.2 **IMPORTANCE OF INTERNAL FUNDS**

"*We have seen that on average internal funds (depreciation plus retained earnings) make up the bulk of money that companies need [for investment]. ... Why, then do managers have an apparent preference for financing by retained earnings*?" Brealey and Myers (2000), p. 385.

"*Internal finance is a more important source of funds than debt or equity for investment*" Allen and Gale (2000), pp. 15 – 16.

If a firm is observed to be relying on internal finance, this is mainly attributed to the fact that the firm is financially constrained. This is reflected in the investment-cash flow literature where firms with positive investment cash flow sensitivities are regarded as being financially constrained, that is, these firms find it costly to gain access to external finance (FHP, 1988). However, this view was challenged by Kaplan and Zingales (1997) (henceforth KZ, 1997) who suggested that positive investment cash flow sensitivities might not necessarily reflect financial constraints.

[1] Here "market-based" also includes access to debt markets, where firms can issue their own obligations rather than through a financial intermediary such as a bank.

In the capital structure literature, firms are often observed to be relying quite heavily on internally generated funds such as cash flow or retained earnings. Myers and Majluf (1984) suggest that this behaviour can be attributed to asymmetric information. The problem in capital markets is that it makes it costly for external finance providers to evaluate the quality of a firm. Hence the cost of new debt and equity are much higher than the opportunity cost of using internal finance generated through cash flow and retained earnings. Because of this, firms prefer to use internal finance as it is a cheaper source of finance compared to debt or equity. It has been observed that not only small firms (who suffer more from asymmetric information) rely on internal finance but also established firms such as IBM, General Motors and Ford to name a few.

In this study, it is quite important how we define a financially constrained or unconstrained firm. Previous empirical research has used a number of classification schemes to partition firms between those that are financially constrained and unconstrained. Of the articles in the literature that was among the first to attempt a classification scheme of firms is that by FHP (1988) followed by KZ (1997), Cleary (1999), FHP (2000), KZ (2000), Allayannis and Mozumdar (2004), Cleary et al (2004).

We use different criteria in this study to distinguish between financial constraints. We follow Guariglia (2006) and divide our constraints between internal financial constraints and external financial constraints. Internal constraints are measured as constraints internal to the firm that would influence whether or not a firm chooses to go for external finance. External financial constraints refer to those constraints that limit the availability of external funds to a firm. They represent those factors that normally outsiders would look at before granting funds to a firm. Internal financial constraints are measured by the cash flow and profit distribution, while overall constraints are measured by the distribution of real assets, coverage ratios or a measure of risk.

1.3 **DATASETS**

To study the capital structure of listed firms in the UK, we use data from DATASTREAM. The database contains accounting data for approximately 1,800 UK firms quoted on the London Stock Exchange. The database lists all the firms with available accounting data at the time of downloading. Data is collected over the

1968-2000 period[2]. We focus only on manufacturing firms that operate in the following industries: Metal and Metal goods, Other Minerals and Mineral products, Chemicals and man-made fibres, Mechanical Engineering, Electrical and Instrument Engineering, Motor Vehicles and Parts, Other Transport Equipment, Food, Drink and Tobacco, Textiles, Clothing, Leather and Footwear and Other Manufacturing. We have data on 958 firms that gives us 13110 firm-years of observations.

To study the capital structure of SMEs in the UK we use the Financial Analysis Made Easy (FAME) dataset. FAME is a database that contains information on companies in the UK and Ireland. The FAME database is collected by Jordans Bureau Van Dijk for commercial use. This database includes balance sheet data, profit and loss statements and some other information. This amounts to over 1.3 million companies. For the purpose of this study we have data on 13,556 unquoted manufacturing firms that gives us 81,556 firm-years of observations over the 1994-2003 period.

The CSMAR database contains data on the trading of Chinese stock markets and the financial statements of China's listed companies. This database is designed and developed by Centre for China Financial Research (CCFR) of the University of Hong Kong and GTA Information Technology Company Limited (GTA IT Co., Ltd). The dataset contains data on 1,393 general industry companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange over the 1994-2004 period. For the purpose of this study we have data on 800 manufacturing firms that amounts to 15,806 firm-years of observations.

We undertake a comprehensive study of UK firms and their financing choices using both Datastream and the Financial Analysis Made Easy (FAME) datasets. The former dataset includes only listed companies, whereas the latter includes mainly non-listed companies in the UK. The broad picture may suggest that listed firms would be relatively less bank-dependent while non-listed firms would be more bank–dependent. However for the Pecking Order Model to hold, there will be some listed firms for which bank loans are still preferred over new equity issues, although it is not clear how far this practice is widespread among listed firms. Some of the questions that I will try to answer are: does the Pecking Order Model apply to both listed and non-listed firms in the UK? Are listed firms in the UK mainly bank-dependent? How

[2] Since the structure of the dataset changes after the year 2000, we limit our study to the 1968-2000 period.

widespread is this tendency if it is true? One of the more interesting issues is to investigate how similar or different are the capital structures of firms in the UK and China.

1.4 SPECIFIC AIMS AND METHODOLOGY OF THE STUDY

The main focus of our study will be on two major theories of capital structure namely the Trade-off Theory (TOT) and the Pecking Order Theory (POT). According to the Trade-off Theory, an optimal capital structure is achieved by "trading-off" the costs and benefits of debt (Berens and Cuny, 1995, Fama and French, 2002, Shyam-Sunder and Myers, 1999). In the trade-off model, companies equate the costs and benefits of debt and choose a debt level that optimises the value of the firm. According to the POT, firms have a strong preference for internal finance (Myers, 1984) as internal finance is believed to have a cost advantage over new debt and equity. If external finance is required, firms first issue debt and when all other "safe" options are exhausted, they issue equity as a last resort. The literature regarding the POT has been dormant since its inception in the early 1980's when it was first proposed by Myers (1984) and Myers and Majluf (1984). It is only in the late 1990's that a new interest has been revived in the POT by financial theorists.

We mainly examine the relationship between debt and cash flow in both quoted and unquoted firms in the UK. Quoted firms are likely to be big firms as they have access to stock markets and can thus issue public equity. Unquoted firms are mainly Small and Medium-sized firms (SMEs) who do not have access to stock markets and mainly rely on debt as their primary source of external finance. There are various reasons why we study quoted and unquoted firms. First, most capital structure theories have been developed to explain the capital structure of large firms and the question whether these theories apply to SMEs is still a puzzle. Also, comparing the financing decisions of quoted and unquoted firms (SMEs) would be interesting and maybe unquoted firms can follow in the footsteps of quoted firms and learn how to grow.

Firms with different levels of cash flow are likely to have different levels of debt. However, no studies have attempted to take this into account. An innovative aspect of our study is that we account for firms having different levels of cash flow. Most of the financial constraint literature has only studied how financial constraints affect firms' investment decisions. Financial constraints could possibly affect capital

structure decisions, that is, the amount of debt that a firm holds. For instance, the degree of financial constraints that a firm faces might well affect the amount of internal finance that a firm uses or more importantly the amount of debt that a firm has in its capital structure. Instead of analysing firms in the whole economy as has been done in a number of studies, we follow Fazzari et al (1988) and study firms only belonging to the Manufacturing sector[3].

Another innovative aspect of our study is that we examine the capital structure decisions of firms in China and also investigate how the presence of financial constraints affect the capital structure decisions of listed Chinese firms. Sources of external finance are limited in economies in transition. Firms in these economies can be heavily dependent on financing sources such as bank credit. Factors that affect the capital structure of firms in developed countries might not have the same effect on the capital structure of firms in transition economies. Due to the availability of good quality financial data, China is the ideal case to study these issues.

The main estimator used in our study is the first-difference GMM estimator (Arellano and Bond, 1991). Unlike the OLS and Within-Groups estimators, the first-difference GMM estimator takes into account both unobserved firm heterogeneity and potential endogeneity of regressors.

1.5 STRUCTURE OF THESIS

The first part of Chapter 2 provides a review of literature and surveys studies that have investigated the capital structure decisions of listed firms across various countries. In particular, we focus on the Trade off Theory and the Pecking Order Theory of capital structure. In the second part, we focus on the financing decisions of SMEs across a cross section of countries.

In Part I of chapter 3, we study the capital structure decisions of quoted firms in the UK. We mainly concentrate on the relationship between debt and cash flow. Quoted firms are likely to be the relatively larger firms in our sample, with access to stock markets and could issue public equity if they so desired. However, even in the UK, where stock markets are quite well-developed, firms do not rely a lot on equity but more on other sources of finance such as internal funds and debt. The innovative

[3] According to the DTI (2004), Manufacturing represents a sixth of the UK economy and it is responsible for the majority of UK exports. It is also one of the biggest employment providers and responsible for the bulk of research and development in the UK.

aspect of our study is that we account for (overall) financial constraints and show how these constraints affect the capital structure decisions of firms.

In Part II of Chapter 3 we examine the same issues as in Part I of Chapter 3 but here the focus is on unquoted firms in the UK which are mainly small and medium-sized firms. Unlike Part I, we examine both internal and overall financial constraints that firms might face as unquoted firms are likely to suffer more from both types of financial constraints. By internal constraints, we refer to financial constraints that are present inside the firm and that encourages the firm to go for external financing. On the other hand overall constraints refer to those constraints that outsiders would consider important and which could signal to an outsider that a firm is financially constrained. For example if a firm has insufficient internal funds, we would refer to the firm as being internally financially constrained. If a firm has low real assets (small firm), then we would say that firm is financially constrained as outsiders (lenders) would be unwilling to lend to it.

Chapter 4 reviews the Chinese economy where we discuss the transition and reform process in China. We also discuss finance and growth in the Chinese context and provide a detailed description of the Chinese financial system where we focus on the development of the stock market and the banking system. We also look at the FDI phenomenon in China in more detail to examine if FDI has relaxed the financial constraints that Chinese firms face.

In Chapter 5, we study the capital structure decisions of listed Chinese firms. The main issue addressed in this chapter is to test whether the financing decisions made in listed Chinese firms are different from those made by listed firms in the UK. This is interesting as in China, property rights are not well-defined and the financial system is not very efficient. Furthermore, this directly addresses the issue whether financial system development is important for the mobilisation of resources to firms as a number of studies including Levine (2002), La Porta et al (1999) amongst others have found financial system development to be a pre-requisite for growth. We also examine whether the financing of firms differ across eastern (coastal), central and western provinces as regional disparity is a serious issue in China. Additionally, we investigate if subsidies and accession to the WTO has affected the leverage decisions of firms. Studying the effects of WTO is important as this was a very significant event for China especially as it meant that China now has secure export markets.

Chapter 6 reviews studies based on cash holdings. We are interested in this literature as it is found that the Chinese firms in our sample hold a major portion of their assets in the form of cash. We find that most empirical studies on cash holdings have been based on listed firms in the US and there is a gap in the literature where the cash holding behaviour of firms in other parts of the world has not been given its due attention. We also examine the determinants of cash holdings of Chinese manufacturing firms listed on the Shanghai and Shenzhen Stock Exchanges. Additionally we examine if financial constraints affect cash holding behaviour and whether WTO accession has had an effect on the cash holdings behaviour of listed manufacturing firms in China. This chapter also puts some emphasis on the bank-firm relationship that exists in China and provides an explanation about the changing conditions in which agents are operating.

Chapter 7 concludes. We provide a synthesis of financing decisions under financial constraints of both firms in the UK and China. We also discuss some policy implications and directions of future research.

CHAPTER 2

SECTION A

REVIEW OF LITERATURE

This chapter reviews the various theories that have been proposed in the literature to try to provide some explanation for the capital structure decisions of firms. In particular, we focus on the heterogeneity of firms and try to determine how firms make decisions about the mix of internal and external finance in their capital structure.

In section 2.1, we consider the major capital structure theories that have been proposed in the literature. These theories have been classified into three main categories, namely tax-based theories, agency cost theories and asymmetric information and signaling theories. The main theory that takes into account both taxes and agency costs is the Trade-off Theory (henceforth TOT) while the main theory under asymmetric information and signaling theories seems to be the Pecking Order Theory (henceforth POT). Section 2.2 provides an in-depth study of the TOT, followed by section 2.3 that provides a discussion of the POT. Section 2.4 provides further discussion on recent studies.

2.0 INTRODUCTION

Modigliani and Miller (1958) provided the theoretical approach that under the perfect capital markets assumption, financial structure and financial policy are irrelevant for real investment. In particular, since perfect markets exist there is no difference between internal and external finance and they are thus perfectly substitutable. As argued by Fazzari, Hubbard and Petersen (1988) (henceforth FHP), financial structure becomes relevant when the highly unrealistic assumption of perfect capital markets is dropped. Another important aspect that has been largely sidelined in the financial literature is the heterogeneity of firms. The literature on financing of firms has mainly focused on 'the representative firm,' (FHP, 1988). The 'representative firm' faces perfect capital markets and is thus indifferent between the various sources of finance available.

Firms are not homogeneous and treating them as such destroys valuable insights that can be obtained. Some studies have tried to show that firms are not

homogeneous by focusing on asymmetric information. However, putting asymmetric information aside, there are other more obvious factors that discriminate among firms. The recent literature has tried to make amends and tried to partition firms into various categories instead of just lumping all firms in one group. By attempting a classification of firms into various categories, we can examine whether firms indeed behave differently when they belong to different categories.

The financing constraint literature has been the first to recognise that partitioning firms helps to provide important insights into their behaviour. The pioneers in this field have undoubtedly been FHP (1988) who point out the fact that firms are definitely not homogeneous. They classify firms according to their dividend payout ratio. Their main aim in doing this is to show that firms that have different dividend payout ratios and therefore belong to different categories, have differential access to finance.

Some firms are financially constrained while others are not. Following FHP (1988), a number of studies have tried to distinguish between various categories of firms. For instance, Whited (1992) uses measures of indebtedness, interest coverage, and whether or not a firm has a bond rating to discriminate among firms. Kaplan and Zingales (1997) use both quantitative and qualitative data to distinguish among firms. Bond et al (1999) classify firms according to whether a firm operates in a bank-based or market-based system.

Cleary (1999) uses a financial constraint index to differentiate between firms, which takes into account a number of factors such as firm liquidity, leverage, profitability, and growth. Carpenter and Guariglia (2003) use the number of employees to distinguish between large and small firms. However, the factor common to all these studies is that they have tried to discriminate only within firms that have access to capital markets.

2.1 OVERVIEW OF MAJOR CAPITAL STRUCTURE THEORIES

Several theories have been put forward to explain the capital structure of firms. An optimal structure is that mix of internal and external finance (debt and/or equity) that optimises the value of a firm. Therefore, the question of how to finance or equivalently from where to borrow becomes a crucial decision. According to Titman and Wessels (1988), firms select capital structures depending on attributes that determine various costs and benefits associated with the form of financing used.

The literature has recognised that there are a number of potential determinants of capital structure. Capital structure theories have been based on agency costs (Jensen and Meckling, 1976), asymmetric information (Myers (1984) and Myers and Majluf (1984)), product/ input interactions (Brander and Lewis (1986)) and theories driven by corporate control considerations (Harris and Raviv (1991)). For a survey on capital structure theories see Harris and Raviv (1991).

It should be noted that most capital structure theories have been developed to explain the capital structure of large firms and the question whether these capital structure theories apply to small and medium-sized firms (SMEs) is still a puzzle. The second part of this study will try to investigate if capital structure theories are relevant to SMEs.

Michaelas et al (1999) partition the theory of capital structure in three categories. These categories are the tax-based theories, the agency cost theories and the asymmetric information and signaling theories.

(i) Tax-based theories

Mackie-Mason (1990), Graham (1996) and Graham (2000) believe that tax benefits of debt affect financing decisions. According to tax-based theories, tax and bankruptcy considerations are a primary force influencing capital structure decisions. Payment of interest on debt is usually tax deductible. Debt interest shields income from taxation and thus profitable firms should use more debt. Michaelas et al (1999) propose the view that tax paying firms would be expected to use debt instead of equity, at least up to the point where the probability of financial distress starts to be important.

Fama and French (2002) propose that firms identify their optimal leverage by weighing up the costs and benefits of debt. The benefits of debt include the tax deductibility of interest and the reduction of free cash flow problems. They further argue that taxes have two offsetting effects on optimal capital structures. The deductibility of interest payments pushes firms towards more target leverage while the higher personal tax rate on debt relative to equity pushes them towards less leverage. Also, bankruptcy costs rise when profitability declines[4]. These costs push firms towards lower leverage targets.

[4] Bankruptcy costs are higher for firms with more volatile earnings, which should drive smaller, less diversified firms towards less leverage.

(ii) Agency cost theories

Agency cost theories concentrate on agency costs, which arise due to conflict of interest. The pioneers of agency cost theory, Fama and Miller (1972) and Jensen and Meckling (1976), identify two types of conflict: conflict between managers and shareholders and conflict between debt holders and equity holders.

Conflict between managers and shareholders arise mainly because managers are not the sole beneficiaries if they work hard to increase profit. Hence, managers will prefer to consume more 'perquisites' eg corporate jets, plush offices, building 'empires' (Harris and Raviv, 1991) rather than increasing shareholders' wealth. Conflicts between debt holders and equity holders arise mainly due to the fact that when an investment pays off, the ones to benefit are the equity holders. When an investment fails, debt holders are the ones to bear most of the cost. Due to this asymmetry in risk-sharing, equity holders prefer very risky projects that have high returns, while debt holders prefer the opposite.

Both these conflicts can be solved by choosing an optimal capital structure that is obtained by trading off the costs and benefits of debt (Jensen and Meckling (1976), Jensen (1986), Harris and Raviv (1990), Stulz (1991), Diamond (1984), Hirshleifer and Thakor (1989)). Debt increases managers' ownership of the firm. For instance, Jensen and Mecking (1976), argue that if a firm is increasingly financed by debt, this implies that it consequently relies less on equity, which in turn implies that the equity ownership of managers (instead of shareholders) in the firm increases[5]. Hence, managers will act in the interest of the firm. They will now benefit more from their "profit enhancement activities" rather than shareholders benefiting. Also, more debt implies that cash is used to repay debt, and thus less cash is available to managers to engage in activities for their personal gain. Hence, debt increases managers' ownership in the firm and ensures they act in the interest of the firm and also by making less cash available to them ensures that they do not engage in activities for their personal gain.

(iii) Asymmetric information and signaling theories

[5] The underlying assumption here is that there is a trade-off between shareholders' and managers' ownership of the firm. Hence if managers' ownership in the firm decreases this implies that shareholders' ownership in the firm increases.

Firm managers or insiders are assumed to possess private information about the characteristics of the firm's return stream or investment opportunities. This branch of literature was first developed by Myers (1984) and Myers and Majluf (1984). According to this branch of literature, firms that issue equity will face underpricing due to the information asymmetry that exists. Ross (1977) proposes a model where he extends the asymmetric information framework. In his model, the managers know about the firm's future returns, while investors do not. High debt levels signal to investors that firms are of high quality, which explains the preference for debt rather than equity. High levels of debt in a firm indicate to investors that the firms investment will indeed pay off and that the firm will be able to fulfil its debt obligations. This is why investors regard high debt levels in firms favourably.

The implication behind this is that when a firm announces an equity issue, the market value of the firms' existing shares will fall. Internal funds and/or riskless debt is preferred as there is no undervaluation involved (Harris and Raviv, 1991). This is referred by Myers (1984) as the 'pecking order' where capital structure is driven by firm's desire to finance new investment, first internally, then with low risk debt and finally with equity as a last resort.

Above, we have considered three broad categories of capital structure: tax based theories, agency cost theories and asymmetric information and signalling theories. Agency and tax-based theories cannot be considered separately as they have many factors in common. They each try to explain why firms use debt in their capital structure. Agency cost theories regard debt as having the capacity to minimise conflicts and control managers' behaviour, while tax-based theories show that debt provides a tax shield for income. In essence, they each try to find some explanation for gearing[6]. Therefore, within the category of agency cost and tax-based theories we will mainly focus on the Trade-off theory of capital structure. In the case of asymmetric information and signalling theories, our focus will be on the Pecking Order theory.

2.2 THE TRADE-OFF THEORY

According to the Trade-off Theory, an optimal capital structure is achieved by "trading-off" the costs and benefits of debt (Berens and Cuny, 1995, Fama and

[6] Gearing is concerned with the relationship between the long-term liabilities that a business has and its capital employed.

French, 2002, Shyam-Sunder and Myers, 1999). In the trade-off model, companies equate the costs and benefits of debt and choose a debt level that optimises the value of the firm. This is illustrated in Figure 2.1 below:

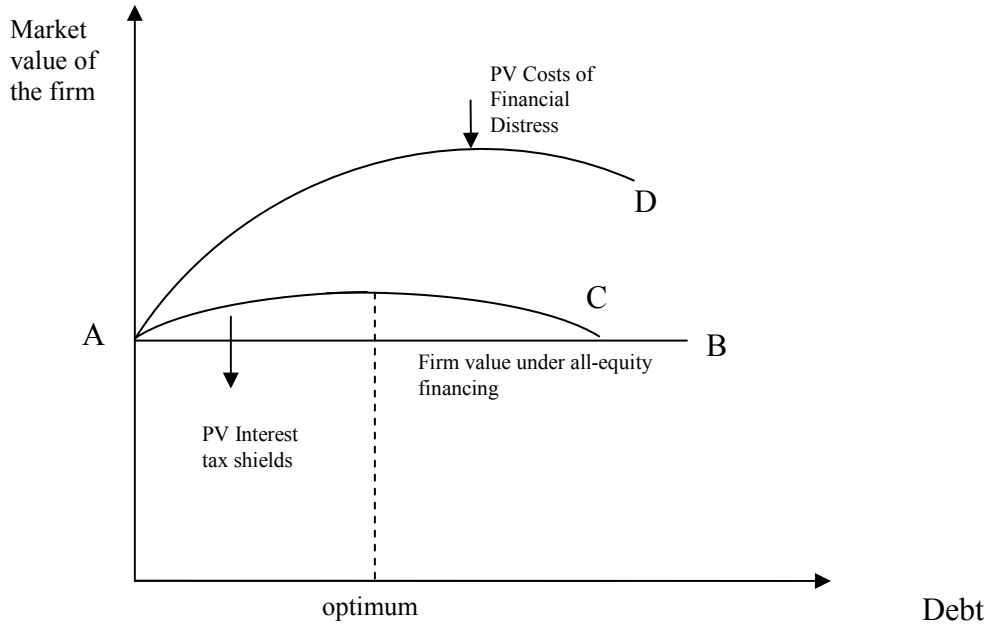


Figure 2.1: The Static Trade-off Theory of Capital Structure.
Source: Myers, 1984 pp 577.

Debt provides firms with an interest tax shield as interest payments are usually tax deductible. This gives an incentive to firms to take more debt in their capital structure. However, this does not lead firms to be fully financed with debt. The reason is that since interest payments are fixed payments, the more debt a firms takes, the more interest it has to pay. This can be explained by the diagram above.

The straight line AB shows the value of a firm under all-equity financing. When a firm undertakes debt it has to pay interest. Interest payments are generally tax deductible, thus when a firm takes debt, it is able to increase its value. This is called the interest tax shield of debt. Debt almost literally shields the firm from paying out more in taxes. Therefore, as curve AC shows, initially as the firm undertakes more debt, the value of the firm increases.

However, after a certain level of debt, (the optimum level), the value of the firm starts falling as shown by the falling portion of curve AC. After a certain level of debt, the costs of debt start outweighing the benefits of debt. This is illustrated by the curve AD, which shows that the costs of financial distress rise significantly at higher levels of debt. At higher levels of debt, firms have to pay more interest and if they are

unable to repay the debt and interest, then they are likely to go bankrupt. As costs of financial distress rise, firms would prefer to stick to a 'reasonable' level of debt. This is illustrated in the diagram above where the optimum market value of the firm is achieved where the present value of the interest tax shield is at a maximum.

The tradeoff model assumes that companies have an optimal capital structure and they aim to attain this through a target debt level. This is the reason why the Trade-off Theory is often referred to as the 'static Trade-off Theory' in the literature. As emphasized by Myers (1984), a firm substitutes debt for equity or equity for debt until the value of the firm is maximized. The Trade-off theory puts a major emphasis on taxes. It explains why firms that pay taxes would prefer some amount of borrowing (Myers, 2001). Interest payments are tax deductible and thus companies that have debt in their capital structure can benefit from an "interest tax shield." In the absence of adjustment costs, the Trade-off theory assumes that each firm's observed debt-to-value ratio should be its optimal ratio.

However, debt also has the disadvantage that it increases the probability of firms becoming financially distressed. The costs of debt include potential bankruptcy costs. Repayment of interest on debt is an obligation that a firm has to fulfill whatever its financial state. Hence, if a firm is unable to undertake its debt obligation it will obviously face bankruptcy as has already been discussed above.

Another cost of debt is the agency conflicts that can arise between stockholders/shareholders and bondholders/debt holders (Fama and French, 2002). This can be explained by the fact that if an investment pays off equity holders are the ones to benefit as they are entitled to the residual profits after interest on debt has been repaid. Risky investments are the ones that normally have higher returns and therefore equity holders will prefer these types of investment. Debt holders on the other hand, are only concerned with their interest payments. They would prefer firms to choose less profitable but safe investments. This explains the conflict that may arise between stockholders and bondholders as has been discussed earlier.

The benefits of debt include the tax deductibility of interest payments (Berens and Cuny 1995). As argued by Benito (2003) firms use debt as a means of constraining the interest of managers which may diverge from the interests of shareholders. In fact, debt reduces free cash flow problems as excess cash is used to repay debt, rather than managers using it to consume perquisites (Fama and French, 2002 and Harris and Raviv, 1991).

2.2.1 REVIEW OF EARLIER STUDIES

(i) **Taggart (1977)**

One of the first papers that attempted to formulate a model of optimal capital structure is Taggart (1977). Taggart (1977) treats the financial decisions as ongoing ones and allows these decisions to be interdependent. Like previous studies, he first illustrates a simple balance sheet. This simplified balance sheet is illustrated below:

TABLE 2.1: SIMPLIFIED BALANCE SHEET

NWA [7] net working assets (inventories, net trade credit and other assets)	***-LIQ*** liquid assets ***SDBT*** short-term debt } TC (temporary capital) ***LDBT*** long-term debt
NK net capital stock (gross capital stock minus accumulated depreciation)	***E*** equity (cumulative gross stock issues minus cumulative stock retirements plus cumulative retained earnings) } PCB (permanent capital at book value)
A (net assets)	A (net assets)

Source : Taggart (1977) pp 1467

Net assets that consist of net working assets (inventories, net trade credit[8] and other assets) and net capital stock (gross capital stock minus accumulated depreciation) are financed by temporary capital and permanent capital. Temporary capital is made up of short-term debt and liquid assets. However, liquid assets enter the balance sheet with a negative sign as firms gain a source of finance when they draw down liquid assets. Permanent capital, on the other hand is made up of long-term debt and equity (cumulative gross stock issues minus cumulative stock retirements plus cumulative retained earnings).

From the balance sheet proposed above, it can be seen that all the financial items have been placed on the right hand side while real assets appear on the left hand side. Taggart (1977) uses the following sources and uses equation as the foundation of his model:

$$\Delta A = \Delta NWA + \Delta NK = \Delta SDBT + \Delta LDBT + \Delta E - \Delta LIQ \qquad (2.1)$$

[7] Net Working Assets= Accounts Receivable-Accounts Payable-Tax Accruals+ Consumer Credit+ Miscellaneous assets- Government Loans +Inventories.

[8] Net trade credit would here refer to debtors less creditors.

As its name suggests the sources and uses identity gives the firm's 'sources' of financing and the 'uses' of this financing. The right hand side gives all the financial variables, indicating the possible sources of financing such as short-term debt, long-term debt and equity. It should be noted that liquid assets are placed on the right hand side with a negative sign. This is explained by the fact that firms can reduce their holdings of liquid assets which is regarded then as a source of funds.

The change in equity, can be further broken down and written as:

$$\Delta E = \Delta GSTK + RE - SRET \qquad (2.2)$$

which states that the change in equity is made up of gross stock issues (GSTK), retention of earnings (RE) and stock retirements (SRET).

Substituting for ***E*** the sources and uses identity is thus written as:

$$\Delta A - RE = \Delta SDBT + \Delta LDBT + \Delta GSTK - SRET - \Delta LIQ \qquad (2.3)$$

The right hand side of the equation gives the 'external financing deficit' of the firm. When the cash flow is not sufficient to cover the firm's expenditure on plant and equipment and working capital, this shortage in funds is what is termed as the external financial deficit. The decision of firms therefore boils down to how to make changes on the variables on the right hand side given that an external financial deficit exists.

Firms can either chose to increase the book value of their permanent capital (PCB) or they can increase their temporary capital (TC). PCB consists of long-term debt plus equity while TC is made up of short-term debt minus liquid assets. The problem of firms in each period is to decide what changes they will make in the 5 right-hand side items given the size of their external financial deficit. If more financing is required, firms can increase their book value of permanent capital or they can increase their temporary capital. Changes in permanent capital will be represented by the stock adjustment equation.

$$\Delta PCB = \delta_1 (PCB^* - PCB_{-1} - RE) + \delta_2 RT + RE \qquad (2.4)$$

Where PCB* = NK (net capital stock) + NWA (net working assets). PCB^* is the target value of long-term debt plus equity. PCB_{-1} is PCB lagged one period. The composition of PCB is governed by the desired debt-equity ratio which depends on

the market value of firms' debt (LDM) and the market value of their equity (STOCK). RE refers to the retention of earnings while RT is the interest rate timing conditions. Equation (4) is saying that any change in permanent capital is influenced by the firm's target value of the mix of debt and equity, interest rate timing conditions and the amount of retained earnings. Interest rate timing conditions are important as they affect the financing decisions of firms. Taggart (1977) proposes that if firms expect the long-term interest rates to decline, it may prefer to postpone raising long-term funds and borrow short-term while waiting for interest rates to fall.

Therefore the desired debt-equity ratio PCB* is defined by:

$(LDM / STOCK)^{*} = b$, where b is determined by the trade-off between tax savings and expected bankruptcy costs. However, it should be noted that this ratio reflects the market value of debt. To get the target book value of the long-term debt ratio (LDBT*), the following transformation is done:

$$LDBT^{*} = b\ STOCK(\ i\ /\ \tilde{\imath}\ ) \qquad (2.5)$$

Where STOCK is the market value of equity, i is the current interest rate on long-term debt while ĩ is the average contractual interest rate on long-term debt. LDBT is affected by the permanent capital target, but is also affected by the desired split of PCB (permanent capital) between long-term debt and equity. Long-term debt issues are affected by interest rate timing conditions while bond issues are affected by the timing of bond issues.

The adjustment equation for LDBT can be written as:

$$\Delta LDBT = \alpha_1 (LDBT^{*} - LDBT_{-1}) + \alpha_2 (PCB^{*} - PCB_{-1} - RE) + STOCKT + RT \qquad (2.6)$$

LDBT is the long-term debt level, LDBT* is the target level of long-term debt, $LDBT_{-1}$ is LDBT lagged by one period. PCB is permanent capital, PCB* is the target value of long-term debt plus equity, RE is retention of earnings, RT is the interest timing variable and STOCKT is the stock market timing variable. Equation (2.6) implies that long-term debt issues will be stimulated by a shortfall of actual LDBT from the long-term target level debt level (LDBT*) and also by a shortfall in the PCB term. Long-term debt issues will also be influenced by the interest rate timing variable and the stock market timing variable. The coefficients α_1 and α_2 can sometimes have opposing influence implying that if the target level long-term debt (LDBT*) grows faster than the assets in place, then the term PCB has to go up, that is the firm has to increase its capital (most likely by issuing equity). This restrains bond

issues (debt issues) and hence curbs the firm's ability and willingness to take more debt in its capital structure.

Taggart (1977) also presents adjustment equations for liquid assets and short-term debt and show how the change in liquid assets and short-term debt adjust to a target liquid ratio and a target short-term debt ratio following some of the above mechanisms. Using data on non-financial US firms, Taggart (1977) constructs market values of long-term debt (LDBT) and equity, the stock market timing variable (STOCKT) and the interest rate timing variable RT. He obtains 62 observations reflecting quarterly data over the 1957 Q3 to 1972Q4 period. His findings imply that when the firms in his sample have a debt/equity ratio that is below target, they indeed issue more debt and less stock. When permanent capital (PCB) is below target, firms issue more of both bonds and stock. However, he finds that the adjustment coefficients are quite small implying that adjustment is slow. He also finds that timing considerations have an important influence on corporate financing decisions.

(ii) **Marsh (1982)**

One of the very first studies dealing with financing choices of firms in the UK is the study by Marsh (1982). He analyses how companies actually select between financial instruments. Marsh (1982) examines a sample of UK firms making debt and/or equity issues and tries to explain the financing behavior of these companies. He assumes that a company's choice of financing instrument is a function of the difference between its current and target debt ratios as illustrated below:

$$Pr\ (Z_{ij}=1) = Pr\ (D^{*}_{jt} - D_{ij} < 0) \qquad (2.7)$$

$Pr\ (Z_{ij}=1)$ states the probability that a company will issue equity at time t given that it will either make an issue of equity or bonds. Where D^{*}_{jt} is the firm's target debt ratio and D_{jt} is the firm's actual debt ratio.

The model assumes that when firms need funds, they will either issue equity or bonds. Since D^{*}_{jt} is unobservable, the model assumes that there are a number of factors that determine this target debt level. The model is therefore specified as follows:

$$D^{*}_{jt} - D_{ij} = B' \chi_{ij} + \mu_{ij} \qquad (2.8)$$

Where χ_{ij} is a vector of explanatory variables, B is the corresponding vector of coefficients and μ_{ij} is the stochastic error term. The final specification of the model therefore becomes:

$$Pr\ (Z_{ij}=1) = Pr\ (B'\ \chi_{ij} + \mu_{ij} < 0) \qquad (2.9)$$

This implies that the probability that a company will issue equity at time t given that it will either make an issue of equity or bonds depends on a number of factors. These factors include variables such as company size, risk, asset composition, market timing conditions and a number of other factors that have been proposed in the literature.

Marsh (1982) uses a logit analysis on a sample of 748 issues of equity and debt made by UK quoted companies over the 1959-1970 period. He finds that the companies' existing financial structure does not really influence the choice between debt and equity. Issues of debt and equity occur at discrete intervals but when they do occur, the debt or equity issue is a quite large one. Marsh (1982) finds that companies are very concerned with market conditions and the past history of security prices, in choosing between equity and debt. Companies do tend to have target levels of debt in mind for both the short-term and the long-term. But these thoughts themselves are influenced by factors such as company size, bankruptcy risk and asset composition. However, Marsh (1982) does not distinguish between the three forms of finance as proposed in the POT.

(iii) **Jalilvand and Harris (1984)**

Jalilvand and Harris (1984) study the financing decisions of US corporations. In particular, they relax the assumption of perfect capital markets and study whether there is a relationship between financing decisions and the value of a firm. Due to the presence of imperfections such as adjustment costs or constraints, firms may not be able to immediately adjust to their target levels of capital structures and will therefore chose to achieve at least partial adjustment in every time period.

Jalilvand and Harris (1984) investigate a process of partial adjustment. Interestingly, they allow speeds of adjustment to vary by firm and over time depending on the size of the firm and capital market conditions. They assume that the investment decision is exogenous. In particular, they believe that the firms decision of how to finance will affect the cost of capital it faces. Their second simplifying assumption is that all targets are specified in terms of book values rather than market values. This is due to the fact that market values tend to fluctuate a lot and therefore

is difficult to use the values in empirical research. For example both Marsh (1982) and Taggart (1977), use book values rather than market values[9].

Following Taggart (1977) they develop their model based on a stylized balance sheet. They set out the following sources and uses equation:

$$\Delta A_t = \Delta LD_t + \Delta SD_t - \Delta LIQA_t + \Delta CP_t + (E_t - DIV_t) \qquad (2.10)$$

Where the variables are as defined below:
Δ is the change in a variable from *t-1* to *t*; *LD* refers to long-term debt, *SD* is short-term debt, *LIQA* is liquid assets; *CP* is common and preferred stock, which excludes retained earnings; *E* refers to net profit after taxes and preferred dividends; *DIV* represents cash dividends to common shareholders; while *A* represents firm assets, where *A* is defined as total assets less liquid assets *(LIQA)* and certain other liabilities assumed exogenous (accounts payable, accruals, deferred taxes, investment tax credits and minority interests).

The 'sources' and 'uses' equation attempts to identify the 'sources' and 'uses' of funds. In particular, it says that "the changes in *A* represent the total financing need of the firm which can be supplied by building up long-term debt, building up short-term debt, drawing down liquid assets, and/or building up equity accounts through stock issues or earnings retention" (Jalilvand and Harris, 1984, p 129).

Given the above sources of funding, the total need of funds can be described by a series of equations that make up the adjustment model as described below:

$$\Delta LD_t = \delta_{1it}[LD^*_{it} - LD_{it-1}] + \delta'_{1it}[RLD_{it}] \qquad (2.11)$$

$$\Delta LIQA_t = \delta_{2it}[LIQA^*_{it} - LIQA_{it-1}] + \delta'_{2it}[RLQ_{it}] \qquad (2.12)$$

$$\Delta SD_t = \delta_{3it}[SD^*_{it} - SD_{it-1}] + \delta'_{3it}[RSD_{it}] \qquad (2.13)$$

$$\Delta CP_t = \delta_{4it}[CP^*_{it} - CP_{it-1}] + \delta'_{4it}[RCP_{it}] \qquad (2.14)$$

$$\Delta DIV_t = \delta_{5it}[DIV^*_{it} - DIV_{it-1}] + \delta'_{5it}[RDIV_{it}] \qquad (2.15)$$

Where *LD* is long-term debt, *SD* is short-term debt, *LIQA* is liquid assets and *CP* is common preferred stock, *DIV* is cash dividends to common shareholders.

[9] Additionally, the use of book values makes it easier to relate to changes in balance sheet asset figures (investment) to changes in balance sheet liability figures (financing) Jalilvand and Harris (1984)p 129.

A * on a variable would indicate the target level of that variable while δ and δ' are adjustment coefficients. *RLD, RLQA, RSD, RCP* and *RDIV* are measures that reflect the total financing needs of a firm. These partial adjustment equations are basically made up of 2 parts. Equation 2 for example, shows that a firm would adjust to the difference between its target level of long-term debt (LD^*_{it}) and the level of debt at the beginning of period t-1(LD_{it-1}). If there is complete adjustment (that is the debt level exactly matches the target debt level), the adjustment parameter δ_{it} will be equal to 1 and all the δ'_{it} would be equal to zero. However, in an imperfect market, since adjustment is costly, only partial adjustment is expected and thus δ'_{it} may be non-zero.

The variable *RLD* can be defined as the external financing required for the firm to be able to achieve complete adjustment to its financial target. This can be defined as:

$$RLD_{it} = [\Delta A_{it} - (E_{it} - DIV^*_{it})] - (LD^*_{it} - LD_{it-1}) \qquad (2.16)$$

$[\Delta A_{it} - (E_{it} - DIV^*_{it})]$ represents the firm's total external financing need if the firm is able to adjust completely to all its financial targets. $(LD^*_{it} - LD_{it-1})$ represents the amount of long-term debt financing required to achieve complete adjustment to the long-term target. The difference between these two terms is represented by *RLD*. Similar explanations hold for the rest of the financial variables *LIQA, SD, CP* and *DIV*.

An interesting point to note in Jalilvand and Harris (1984) is that they also make allowance for the fact that speeds of adjustment can be different among different firms and over time. They assume that factors such as firm size, management's expectations about interest rates and management's expectations about stock prices affect speeds of adjustment. It should be noted that Jalilvand and Harris (1984) derive a model that shows that firms have target ratios for each and every financial variable. The Trade-off Theory on the other hand focuses only on a target debt ratio and ignores other financing sources.

Jalilvand and Harris (1984), use a sample of 108 manufacturing companies over the 1963-1978 period. Firm's target ratios are measured as the average of the actual ratios over the entire estimation period. Following Taggart (1977), they use book values to calculate target ratios. Specifically, Jalilvand and Harris (1984) use a three year moving average to calculate target ratios. Hence, the system of equations presented above is estimated using pooled cross-sectional time series data from each

of the 108 firms over the 1966-1978 period. They find that a firm would adjust more quickly to its target level of long-term debt and more slowly to its equity target. They also find that long-term debt, liquid assets and short-term debt are the main sources of firms' financing needs.

2.3 THE PECKING ORDER THEORY

Firm managers or insiders are assumed to possess private information about the characteristics of firm's returns and the investment opportunities available to them (Harris and Raviv, 1991). Various theories have been developed that have attempted to explicitly model this private information which has consequently given rise to theories other than the Trade-off Theory. The Pecking Order Theory (POT) is one such theory that attempts to explain capital structure decisions by formally taking into account the inherent information asymmetry that exists between different parties.

The pioneers that have explicitly accounted for asymmetric information in their work have been Ross (1977) and Leland and Pyle (1977). However, the first ones to actually take into account asymmetric information in the area of capital structure have been Myers (1984) and Myers and Majluf (1984). They show that the choice of capital structure mitigates inefficiencies in the firm's investment decisions that are caused by information asymmetry.

According to the POT, firms have a strong preference for internal finance (Myers, 1984) as it is believed to have a cost advantage over new debt and equity. If external finance is required, firms first issue debt and when all other "safe" options are exhausted, they issue equity as a last resort. The literature regarding the POT has been dormant since its inception in the early 1980's when it was first proposed by Myers (1984) and Myers and Majluf (1984). It is only in the late 1990's that a new interest has been revived in the POT by financial theorists.

The POT proposed by Myers (1984), prescribes a strict ordering or hierarchy of finance: firms use internal finance first then debt and only when such options are exhausted, equity finance is used. This is explained by the fact that internal and external finance are not perfect substitutes. The POT is diagrammatically illustrated below.

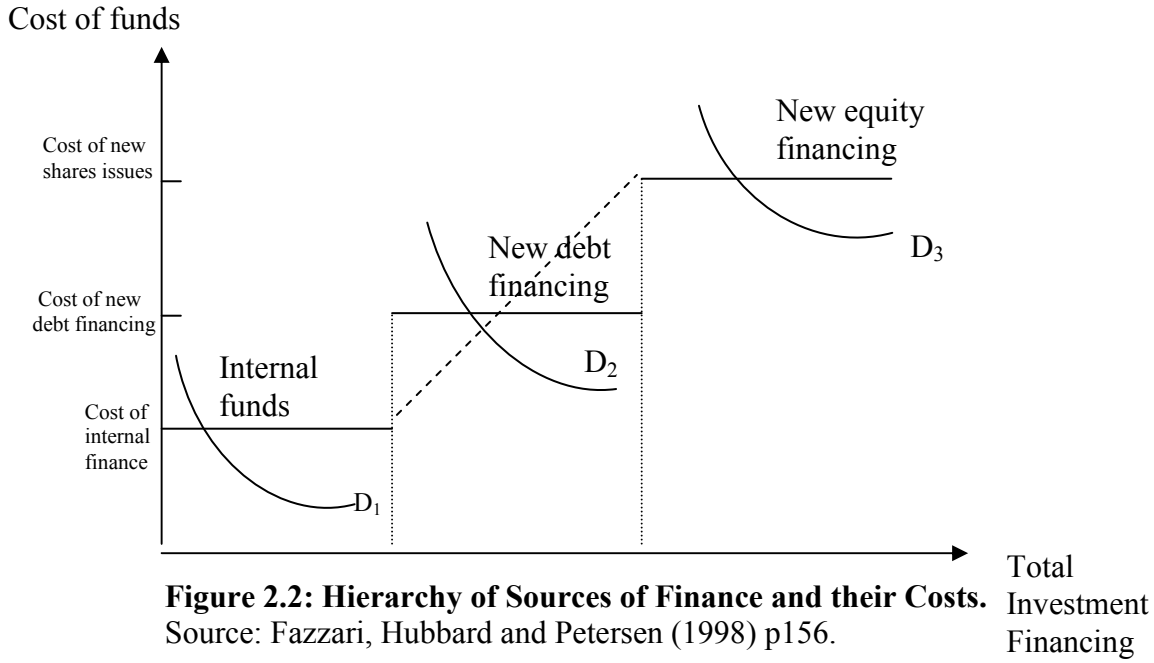


Figure 2.2: Hierarchy of Sources of Finance and their Costs.
Source: Fazzari, Hubbard and Petersen (1998) p156.

D_1, D_2 and D_3 represent investment demand schedules. When investment demand is low at D_1, investment is financed with internal funds, which is relatively cheaper. If investment demand is at D_2, after exhausting the internal funds, external funds are used namely in the form of debt finance. Finally, if investment demand is very high at D_3, equity finance is used after internal funds and debt finance have been exhausted.

This hierarchy can be explained by a number of factors. These factors include the costs associated with each form of finance which are related to the degree of information asymmetry, the "safeness" of each form of finance or the signal that the issuance of some form of finance gives to the market.

Internal finance is believed to be the cheapest source of finance followed by debt and equity. The availability of internal funds allows firms to undertake investment without having to resort to external finance which is relatively more expensive due a number of factors. The issuance of debt and equity usually involves issuance costs that are sometimes prohibitively high.

Also the issuance of debt or equity can cause agency problems to arise. The issuance of debt can cause conflicts to arise between managers and debtholders while the issuance of equity can cause conflicts to arise between debtholders and equityholders as discussed previously in section 2.1. Furthermore, the issuance of external finance namely debt, involves repayment of capital and interest which the

firm has to pay whatever its financial state. This increases the risk of financial distress. All these factors explain why a firm would prefer internal finance over external finance.

Most of the studies regarding the POT have been based on the US. The recent wave of theoretical and empirical literature is quite overwhelming (Shyam-Sunder and Myers (1999), Benito (2003), Chen (2003), Fama and French (2003)) with studies focusing on countries such as Australia, China, Italy, Spain, Turkey, the UK and the US to name but a few. Studies have not only tried to explain the financing choices of large firms but quite a number of studies have also focussed on how the POT can explain the financing choices of SMEs.

Another explanation for the pecking order is provided by Myers and Majluf (1984) that draws from an asymmetric information framework. The management is assumed to know more about the firm's value than the potential investors. Only insiders know the quality of a firm or its investment projects. Therefore outsiders require a premium if they are asked to fund these projects. The degree of information asymmetry regarding equity is higher when compared to debt. Financial intermediaries are able to monitor the firm and gain access to information that outside investors cannot get. Outsiders are normally not able to monitor firms and thus require a much higher premium on equity finance than debt since they are in the dark regarding the growth prospects of firms.

Asymmetric information increases the cost of debt but, on the other hand, tax advantages have an opposing effect, which reduce the cost of debt relative to equity issues (Benito, 2003). The most expensive source of finance is believed to be equity finance due to various costs associated with new equity issues. These costs include underwriting discounts, registration fees, taxes and selling and administrative expenses. Also, firms tend to issue 'safe' securities first, namely in the form of debt rather than equity. Here 'safe' implies that the terms are not affected by managers inside information (Shyam-Sunder and Myers, 1999). Debt cannot be regarded as a 'safe' security as there are costs of financial distress associated with it, but it is still considered 'safer' than equity.

Additionally, Myers (1984), explains this hierarchy by the fact that firms follow the rule of "issue debt when investors undervalue the firm and issue equity or some other security when they over-valuate it." Investors are aware of this and do not buy securities unless they are convinced that the firm has exhausted its "debt

capacity." Hence, investors typically ensure that firms follow a pecking order. Benito (2003) argues that support for the POT comes from the fact that most listed companies in the UK and Spain rarely make new equity issues. An implication for the POT is that firms do not have an optimal capital structure. The difference between investment and retained earnings should be met by debt issue (Viswanath, 1993).

2.3.1: REVIEW OF EARLIER STUDIES

(i) **Myers and Majluf (1984)**

Myers and Majluf (1984) develop a model where they show how information asymmetry can lead equity to be mispriced as investors do not have the same information that insiders have. They consider a firm that has to make an equity issue to raise cash to be able to undertake an investment opportunity. They make the following assumptions:

- There are no taxes, transaction costs or other capital market imperfections.
- The firm has one existing asset and one opportunity requiring investment I. The various ways to finance this investment includes issuing stock, drawing down the firm's cash balance or selling marketable securities. The sum of cash in hand and marketable securities is described as financial slack (S).
- Stockholders are passive, that is, they do not react if an equity issue arises.

They consider a 3 period model. At t=-1, the market has the same information the insiders of the firm have. At t= 0, the management receives additional information about the value of the firm's asset-in-place and investment opportunity and update their values accordingly. The market, on the other hand does not receive this information until t=1.

The firm requires an investment of I. If the financial slack, S is less than I, then the firm needs to issue equity of E= I-S. Myers and Majluf (1984), assume that the project considered is not divisible, therefore either the firm finances the whole project with equity or does not use equity at all; in other words there cannot be partial financing. The firm's existing asset has an expected future value of **A**= E(A). The distribution of A represents the asset's possible (updated) values at t=0. Management's updated estimate at t=0 is **a,** the realisation of **A**.

The net present value (NPV) at $t=-1$ of the investment opportunity is $\boldsymbol{B}= E(B)$. The distribution of B represents the asset's possible updated NPVs at t=0. Management's updated estimate at $t=0$ is **b**, the realisation of **B.** To ensure limited liability, negative values of a and b are ruled out. Interestingly, Myers and Majluf (1984), assume that management acts in the interest of 'old' shareholders, that is those owning shares at the start of $t=0$. They maximise $V^{old} = V(a, b, E)$, that is, they maximise the 'intrinsic value of the old shares conditional on the issue-invest decision and knowledge of the realizations a and b'. However, the market value of these shares will not generally be equal to $V_{old.}$ Investors, on the other hand, know only the distribution of **A** and **B** and whether shares are issued.

If stock is issued, the market value of old stockholders' share at $t=0$ is P' whereas if stock is not issued, the market value of their shares is P. Since old stockholders are assumed to be passive, if stock is issued it goes to a different group of investors. The value of slack (S) is fixed and is known by both managers and the market. The model assumes that $0 \leq S < 1$. Hence, some or the entire project must be financed by a stock issue. By varying slack S, the size of the required issue is varied, $E= I-S$. If the firm knowing the true values of a and b, does not issue then it forfeits the investment opportunity so that the value of the firm is still $V_{old}= S+a$. The slack therefore remains in cash or liquid assets. If the firm decides to issue and invest, then $E= I-S$. The value of the firm becomes:

$$V_{old} = [\, P'/ (P'+ E)] \,/(E+S+a+b) \qquad (2.17)$$

Old stockholders are better off if the firm issues only when the following inequality holds:

$$S+ a \leq [\, P'/ (P'+ E)] \,/(E+S+a+b) \qquad (2.18)$$

which can be written as:

$$[\, E/ (P'+ E)] \,/ (S+ a) \leq [P'/ (P'+ E)] \,/(E+b) \qquad (2.19)$$

The above equation implies that old shareholders are only better off when the firm issues equity if the share of existing assets and slack going to new stockholders is less than the share of increment to firm value obtained by old stockholders. This can be expressed as:

$$(E/P')(S+a) \leq E+b \qquad (2.20)$$

The equilibrium conditions obtained by Myers and Majluf (1984) imply that the firm may pass up good investment opportunities rather than sell stock to raise funds. One important conclusion of the Myers and Majluf (1984) model is that the decision to issue stock always reduces stock price. It should be noted that in their model, the firm never issues equity. If it issues and invests, it always issues debt, regardless of whether the firm is over or undervalued.

The decision not to issue equity will provide "good" news, implying that the firm has a high value while the decision to issue will send the bad signal that the firm has a low value and that is why it is issuing equity. In summary, the results obtained by Myers and Majluf (1984) indicate that managers always act in the interest of existing shareholders and since an equity issue almost always causes the price of shares to fall, managers will try their best to avoid issuing equity. It is this behaviour that results in a pecking order, whereby managers always prefer debt over equity. Investment opportunities would be forgone rather than financed with equity issue.

(ii) **Krasker (1986)**

Krasker, (1986), tries to generalise the Myers and Majluf (1984) model. In the Myers and Majluf (1984) model, the capital needs of the firm's investment opportunity are fixed and know by investors and management's choice is simply to raise the required funds or forgo the investment altogether. However, in Krasker's model, management's decision is not whether to invest or not, but rather how much to invest.

Following Myers and Majluf (1984), Krasker (1986) too assumes that the number of new shares issued by a firm affects the firm's stock price when asymmetric information is a serious problem. The announcement of an equity issue is associated with a drop in the corresponding share price. This can be explained by the fact that a stock issue sends the signal to the market that the firm's current assets are overvalued and drives down the share price. By generalising the Myers-Majluf model, Krasker (1986) allows the firm to choose not only whether to issue stock or not but also how much of stock to issue.

Krasker (1986), considers a 2 period model where a firm has both assets in place and investment opportunities. The management must decide in the first period how much new stock to issue to finance new investment. There is uncertainty about

the value of the firm's investment opportunities and existing assets which managers can observe in the first period but investors can only observe in the second period. He further assumes that the market value of the firm equals its expected value conditional on the market information. The issue size is treated as a continuous choice variable. The model predicts that in a sample of firms that issue stock, the stock price will be negatively correlated with the issue size. The model also predicts that if the information asymmetry is restricted to the value of the existing assets, the higher the uncertainty about the value of the existing assets, the higher stock prices are. Basically, Krasker (1986) confirms the results obtained by Myers and Majluf (1984); implying that an equity issue would provide a bad signal to the market and cause stock prices to fall.

(iii) **Narayanan (1990)**

Following Krasker (1986), Narayanan (1990), has also tried to use a modified version of the Myers-Majluf (1984) model to try to provide an explanation for the use of debt in the capital structure of firms. The basic premise of Narayanan (1990) model is the same as the Myers-Majluf (1984) model, however, he assumes that information asymmetry exists only regarding the new investment opportunity and that the value of the firms asset-in-place is common knowledge. Another important difference is that while Myers and Majluf (1984) assume that debt is risk-free, Narayanan (1990) assumes that debt is risky.

In Narayanan (1990), the value of any single firm in equilibrium is the average value of all firms in the market. Firms have to raise outside capital since their retained earnings fall short of the required investment. He considers two scenarios. In one scenario, the firm is only able to raise finance through equity financing while in the second scenario, the firm is only able to issue risky debt. In both scenarios, Narayanan (1990) shows that at least some 'lemons,' that is 'bad' firms remain in the market. However, in a market where risky debt is used fewer lemons remain than in a market where equity is used. The final result obtained by Narayanan (1990), seem to indicate that managers should use debt financing if their firms are undervalued and should use equity if they believe that their firms are overvalued.

However, it is clear that in this situation, a debt issue would clearly signal to outsiders that the firm is undervalued while an equity issue would give the signal that the firm is overvalued. For this reason, outsiders (investors) would be unwilling to

buy equity. The firm would therefore be forced to finance its investment with debt or forgo the investment. It is this 'signaling' ability of the mode of financing that ensures that firms follow a pecking order in their financing.

The problem with the theoretical studies considered here is that they all try to provide some explanation of why internal finance is preferred over debt or why debt is preferred over equity. However, none of these studies try to take into consideration the choice between internal finance, debt and equity finance simultaneously as proposed by the POT.

(iv) **Other Studies**

Also, there are other theoretical studies that have built upon the Myers-Majluf (1984) model but which have rejected the existence of a pecking order in the financing of firms. These studies include Brennan and Kraus (1987), Noe (1988) and Constantinides and Grundy (1989).

Information asymmetry creates adverse selection problems for firms. Brennan and Kraus (1987), propose that a firm's financing strategy may act as a communication device that can help firms to overcome this information asymmetry. They argue that "investment opportunities may be efficiently financed by an appropriate choice of financing instruments" that can reveal private information of corporate insiders to investors. They develop a model where they show that investors anticipate the choice of a particular financing strategy to have been made by the worst possible type. If firms believe that investors will price financings at their worst case values then firms are induced to make worst case financings, confirming investors' beliefs. A worst case financing is one for which the firm can be assured that the market price will not be below the true, full-informational value of the financing.

Brennan and Kraus (1987) derive their model in the case of a firm making both an equity issue and debt retirement. The theoretical model proposed by them violates the POT. Firms in their model would issue equity and retire debt rather than preferring to issue debt over equity as proposed in the POT. However, there are concerns as to how realistic their model is.

Noe (1988), assesses the viability of the pecking order hypothesis within a signalling game context. He proposes a model which takes into account uncertainty. If insiders face no uncertainty and have perfect foresight regarding the firm's future cash flow then firms prefer debt financing. However, when firms face uncertainty,

they fear that if they issue debt it may be mispriced. Hence they prefer to issue equity when faced with uncertainty, which violates the POT.

Likewise, Constantinides and Grundy (1989) who study the signalling ability of the chosen mode of financing, also derive a model where the POT is violated. In their model a straight issue of debt has no signalling ability. Only an issue of convertible debt or a stock repurchase can have any signalling ability, where managers can signal their private information to the market. Their model inherently violates the pecking order model as there is no clear-cut distinction between debt and equity as proposed by the POT.

2.4 RECENT EMPIRICAL STUDIES ON CAPITAL STRUCTURE

Recent studies regarding capital structure have concentrated primarily on contrasting the two main theories of capital structure namely the Trade-Off and the Pecking Order theories. Most studies regarding capital structure have focused on the US. For instance, Myers (2001) finds that most of the investment in the US is financed from internal cash flow and while external financing does form a small part of investment, a major portion of it is obtained from debt sources.

- **STUDIES BASED ON US DATASETS:**

Vogt (1994) examines the role of internal financial resources in firm financing and investment decisions. His primary focus is whether the POT or partial adjustment to long run targets (as proposed by Jalilvand and Harris (1984)) can explain external financing behaviour of firms. He also tries to determine how good a substitute external finance is for internal finance.

Vogt (1994) uses data on manufacturing firms in the US over the 1972-1986 period. He uses the three stage least squares method to improve the parameter estimates. The three stage least squares method is expected to take into account potential cross-equation correlation in the residual. Further, he uses a fixed effect model to capture time and firm specific movement in the firm's unobserved target capital structure. He finds that firms indeed follow a pecking order and use finance as has been prescribed by it. That is, they use internal finance first, then debt and finally equity. Firms who pay low dividends and are thought to be more internally financially constrained seem to exhibit a stronger pecking order behaviour. Firms that seem less internally financially constrained seem to be more inclined towards

adjusting to a target capital ratio. Hence the results obtained by Vogt (1994) find evidence both in favour of the POT and the fact that firms seem to adjust partially to target capital structures.

Shyam-Sunder and Myers (1999), test the static Tradeoff model against the POT. They perform their test on 157 US firms during the 1971-1989 period. They present an equation for the pecking order model that is shown below:

$$\Delta D_{it} = a + b_{po} DEF_{it} + e_{it} \qquad (2.21)$$

Where D_{it} is the amount of debt issued by the firm *i* and DEF_{it} is the financial deficit of the firm. If the pecking order holds, under the null hypothesis, the pecking order coefficient b_{po} should be close to 1. The intuition behind this is that the financial deficit of firms should mainly be met by debt. The 'financial deficit' is defined as 'the sum of capital expenditures, dividend payments, the net increase in working capital and the current portion of long-term debt (at the start of the period) less operating cash flows, after interest and taxes," (Shyam-Sunder and Myers ,1999, pp 224). They find that the POT is better able to explain the time series variance in actual debt ratios than a target adjustment model based on the static trade-off theory. However, their results are not statistically significant.

Chirinko and Singha (2000) provide a critical study on the approach taken by Shyam- Sunder and Myers (1999). They argue that the testing strategy of the latter is too simple and that factors other than the financial deficit affect the debt level of firms. In particular, the regression equation of Shyam-Sunder and Myers (1999), is not really able to distinguish between the hierarchy of sources of finance. Specifically, the equation is not able to distinguish cases where the financial hierarchy is violated and firms prefer to issue equity instead of debt. Also, they find that the tests of Shyam-Sunder and Myers (1999) are not 'powerful' enough. Chirinko and Singha (2000) conclude that alternative tests are needed that would be better able to identify which factors influence capital structure and can discriminate among competing hypotheses.

Minton and Wruck (2001) examine the phenomenon of financial conservatism by examining firms that adopt persistent policies of low leverage. They define financial conservatism as a persistent financial policy of low leverage. They use data

on non-financial and non-regulated firms from CRSP and Compustat over the 1974-1998 period. Their main finding is that financially conservative firms follow a pecking order style financial policy, where financially conservative firms are defined as firms who have a long-term debt ratio in the bottom 20% of the debt ratios of all firms for 5 consecutive years. These low leverage, financially conservative firms are highly profitable, generate cash flow that is sufficient to fund discretionary expenditures and in addition is sufficient in to add to existing cash balances. Therefore, financially conservative firms stockpile financial slack or debt capacity.

Fama and French (2002) empirical study considers 3000 US firms, with data over the 1965-1999 period. While considering a larger number of firms than previous studies, this article also provides separate tests for dividend and non- dividend paying firms. The results obtained by Fama and French (2002) support the pecking order model in the sense that firms always seem to prefer internal finance over external finance. However, they also find that the POT fails in the assumption that firms will always issue debt before stock. In the case of non-dividend paying firms with low levels of leverage equity issuance forms quite a major part of financing[10].

Frank and Goyal (2002), modify the empirical specification of the pecking order theory proposed by Shyam-Sunder and Myers (1999). Their belief, similar to that of Chirinko and Singha (2000) is that the empirical specification of Shyam-Sunder and Myers (1999) is too simple and omits some important factors. Frank and Goyal (2002) test the POT on a sample of large US firms over the 1971-1998 period. They disaggregate the financial deficit component used by Shyam-Sunder and Myers (1999), and find empirical support for the POT in the sample of large firms in the earlier years of the sample. However, in the later years of the sample, support for the POT declines. This is explained by the fact that the stock market in the US is lately dominated by small high-growth firms who prefer to issue equity and maintain their debt borrowing capacity. This violates the POT.

Byoun and Rhim (2003) investigate implications of the Tradeoff Theory and the POT. They use US data over the 1981-2000 period. Their findings suggest that both the Tradeoff and the POT are relevant. They find that firms seem to have a target debt ratio and actual debt ratios seem to be an important determinant of the

[10] This violation of the simple pecking order model can be explained by the fact that small high growth firms want to retain their 'borrowing capacity' by issuing equity. They may have to fund future investment projects so they prefer to issue equity now and debt later.

amount of debt a firm is willing to take. Moreover, they find that the POT is also able to explain variations in debt levels. Interestingly, Byoun and Rhim (2003) find that when the financial deficit of firms is negative, the surplus is used to repay debt. It also seems that the POT is more applicable to small firms and non-dividend paying firms. This is due to the fact that small firms do not have easy access to external finance and usually face high transactions costs. They are thus forced to abide by the pecking order, that is, issue debt before going for equity finance as the transaction costs for the latter are quite high.

Halov and Heider (2004), empirically examine the role of risk in the capital structure decisions of firms. They obtain their data by merging the CRSP-Compustat database over the 1971-2001 period. They argue that the traditional POT puts a lot of emphasis on the role of asymmetric information to explain financing decisions of firms. However, an important factor that also affects financing of firms and that has been ignored in the literature is the role of risk. Small and young firms face more severe asymmetric information problem than large and mature firms. But the POT fails to explain why small firms that are supposed to face more severe asymmetric information problem generally issue equity.

Halov and Heider (2004), argue that introducing risk into the pecking order model helps to explain why young, small firms face a more severe but also a different type of asymmetric information problem than large firms. They argue that debt dominates equity financing as proposed by the POT, only when there is no asymmetric information about how risky a firm's future investments are. Small firms are likely to face more severe asymmetric information as regards the riskiness of their investments compared to larger firms. Hence small firms might not find it so easy to obtain debt financing. According to Halov and Heider (2004), this might help to explain why the POT performs better for large firms and performs badly for small firms.

Existing literature has found some evidence against the static Trade-off Theory. For instance, Graham (2000) finds that profitable firms tend to have lower debt levels. Hennessy and Whited (2004) argue that this anomaly can be resolved if instead of taking into account a static model, we consider a dynamic Trade-off model. The novelty in their study is that they solve and simulate a dynamic model of investment and financing under uncertainty where the firm faces 'a realistic tax environment, has small equity flotation costs and financial distress costs'. The firm

maximizes its value by making two interrelated decisions: how much to invest and also how to finance this investment. The investment can be financed internally, with debt or with external equity.

Hennessy and Whited (2004), assume in their model that debt is issued only in period 1 and that leverage is assumed to exhibit hysteresis. This implies that firms having higher lagged debt would in fact issue more debt in the next period. They present a simulation model by taking reasonable parameter values from a number of previous studies. Data from Compustat is used in the simulation process. They have an unbalanced panel of firms over the 1993-2001 period and they have between 592 and 1,128 observations per year. Their main finding is that generally firms behave in accordance with the static POT. However, changes in the tax regime can cause firms to behave differently.

Firms pay both corporate income tax and also pay taxes on interest income. When the corporate income tax level is above the tax rate on interest income, Hennessy and Whited (2004), find that firms prefer to finance solely with equity only 3% of the time. These firms issue equity as they expect they would be needing equity in the future. But the rest of the firms abide by the POT, that is, they prefer to use more internal funds, followed by debt and finally equity. When the corporate income tax rate is below the tax rate on interest income, then the firm always retains funds and only finances with equity. When the corporate income tax rate is increased to 40%, the tax benefit of debt is sufficiently great for firms to find it optimal to issue debt.

The Trade-off Theory assumes that firms have a target capital structure; in other words, firms have a target debt ratio. When events push firms away from their optimal capital structure, firms should respond by consciously rebalancing their leverage back to the optimal level. However, sometimes there are significant adjustment costs involved and firms therefore take a long time to move back to their target capital structure. Leary and Roberts (2004), empirically examine whether firms engage in a dynamic rebalancing of their capital structures while allowing for costly adjustment.

They use data from Compustat over the 1984-2001 period and restrict attention to firms with at least 4 observations. They use an unbalanced panel containing 127,308 firms and find that debt issuance occur more frequently than equity issuances. Leary and Roberts (2004) find evidence that firms consciously

adjust to a target capital structure and that firms engage in what they call 'dynamic rebalancing.' It should be noted that this rebalancing result obtained by Leary and Roberts (2004) is consistent with the previously discussed studies of Jalilvand and Harris (1984) and Fama and French (2002). Hence, this paper finds evidence in favour of the Trade-off Theory.

Mayer and Sussman (2004), use data from Compustat over the 1988-1998 period and try to study a sample of firms that have large investments during the period covered. To do this, they use a filtering technique and obtain a dataset of 535 investment events each of a fixed 5 year duration with an investment spike in the middle. Their main aim in doing this is to identify situations when firms face cash shortages. Specifically, they test whether firms prefer to use internal or external funds when they have to finance their investment. They find that investment spikes are mainly funded with external funds, especially in small firms. However, further investigations reveal that although in the short run firms seem to be following pecking order behaviour, in the long run, these same firms exhibit reversion to a target debt ratio that is consistent with the Trade-off Theory. However it should be noted that this study only focuses on quoted companies whose shares are publicly traded.

- **STUDIES BASED ON EUROPEAN DATASETS**

Miguel and Pindado (2001) examine the capital structure of Spanish firms using an unbalanced panel comprising 133 non-financial companies with data over the 1990-1997 period. Their findings suggest that Spanish firms bear transaction costs when they decide to adjust their previous period debt level to the target level in the current period. They also find a negative relationship between cash flow and debt that indicates that as Spanish firms experience an increase in cash flow they tend to reduce their debt levels. It also suggests that these firms prefer to finance their investments with internally generated funds namely cash flow. However, Miguel and Pindado (2001) also find that in the absence of asymmetric information firms suffer from the problem of over-investment. In such cases, to reduce managers' incentive to invest in projects with negative net present value, firms use debt to control the activities of managers. In such cases, this yields a positive relationship between debt and cash flow. However, overall, Miguel and Pindado (2001) find evidence in favour of the pecking order and free cash flow theories.

Benito (2003) examines the capital structure decisions of firms in Spain and the United Kingdom using firm level data for each country. Spanish data consists of 6, 417 companies over the 1985-2000 period. UK data consists of 1,784 quoted non-financial companies over the 1973-2000 period. Benito (2003) tests the Trade-off and POT for each country and finds that the POT is better able to explain capital structure in both bank-based[11] Spain and market-based[12] United Kingdom. His results suggest that there exists a positive relationship between debt and investment and a negative relationship between debt and cash flow which are mainly consistent with the POT. He estimates both GMM (Arellano and Bond, 1991) and random effect probit models. The results remain in favour of the POT. His results imply that in both market-based systems (such as the UK) and bank-based systems (such as Spain), firms follow a pecking order.

De Haan and Hinlopen (2003) investigate the incremental financing decision of a sample of 150 listed Dutch companies for the period 1984-1997. Like previous studies, they distinguish between internal and external finance. The novelty of their approach is that external finance is in turn broken down into bank borrowing, bond issues and share issues. They estimate a multinomial logit model and an ordered probit model. Using this methodology, they find that Dutch companies prefer internal finance to bank loans, bank loans over share issues and share issues over bond issues. This hierarchy is quite close to the POT except that share issues are preferred to bond issues. However, this is explained by the fact that Netherlands is a bank-based economy and the bond market is relatively under-developed which makes the cost of bond issues quite high. Hence share issues are preferred to bond issues, which are themselves used as a last resort.

Panno (2003) investigates capital structure choice by analysing security issues made by companies in the United Kingdom and Italy between 1992 and 1996. In particular, he examines how companies choose between financial instruments, which in this case consist of debt issues or security issues. The reason for studying both United Kingdom and Italy is that since these are two very different financial systems, the results obtained have wide applicability. UK is a market-based system while Italy is a bank-based system. Panno (2003) estimates the coefficients of his model using

[11] In a bank-based system, banks play a positive role in mobilising resources, identifying good projects, monitoring managers and managing risks.
[12] In a market-based system, markets play a positive role in encouraging competition and creating greater incentives for firms to undertake profitable projects.

logit analysis and finds that the results obtained favour the POT. However, the evidence obtained by him also points to the fact that profitable companies both in the UK and Italy have high leverage that is not inconsistent with the Trade-off Theory.

- **STUDIES BASED ON OTHER COUNTRIES**

Ang and Jung (1993), test the POT on a sample of Korean firms. Korean firms are believed to have a unique conglomerate organizational form known as 'chaebol[13].' Ang and Jung (1993) argue that the implicit assumption behind Myers' POT is the existence of asymmetric information. However, it is very difficult to 'measure' the degree of information asymmetry. To be able to investigate the extent to which Korean firms suffer from asymmetric information, Ang and Jung (1993) make use of survey data on 86 firms.

The results obtained suggest that the information problem appears to be high for about 1 out of 4 or 5 firms. Hence the information problem does not appear to be very significant. In fact 80% of firms feel that their lenders do not underestimate their future prospects, that is, there is no information problem. 28% of firms feel that if an information problem exists this cannot be solved by disclosing more information. This would suggest that when information problems do exist it is very difficult to solve these problems[14].

Ang and Jung (1993), separate the firms into 2 different classes: a low information asymmetry group and a high information asymmetry group. They find that firms in the low asymmetric information group prefer the following financing hierarchy: they prefer using retained earnings first, then bank loans and finally new stock. The high information asymmetry group has the following preferences: intermediate term bank loan, short-term bank loan, new stock and then retained earnings.

The results suggest that the high information asymmetry group which according to Myers (1984), should be following the hierarchy as prescribed by the POT in fact behave completely opposite to what is expected. Surprisingly, it is the low information asymmetry group that behaves according to the POT. However, it

[13] Korean chaebols are world class multibillion dollar conglomerates in which a holding company controls several, individually stock exchange-listed affiliates or subsidiaries (Ang and Jung, 1993 pp32-33)

[14] This would further suggest that disclosing information is not really the problem. The problem in fact is the interpretation of that information by the different parties involved.

should be noted that the study by Ang and Jung (1993) relies heavily on survey data which concerns only 86 Korean firms and the widespread applicability of their results is doubtful.

Further, the survey deals with firms preferences of sources of financing, it does not actually ask the firms where they get their funding from. Asking a manager from where the firm prefers to get financing from is not the same as asking him/her from where the firm is actually financing its activities. Therefore, even though Ang and Jung (1993) make a good point of showing that there are factors other than information asymmetry that influence capital structure decisions of firms and finds some evidence against the POT, the results should be interpreted cautiously.

Chen (2003) examines the determinants of capital structure of 88 Chinese listed companies over the 1995-2000 period. He finds that neither the Trade-off nor the POT is able to explain capital structure decisions of firms in China. He explains this by putting forward the reason that China is in a transitional state. In fact, the Chinese government has tried to reform the large and medium-sized owned enterprises previously under state-control. This process is called 'corporatisation.' He further argues that theories such as the Pecking Order and Trade-off may fit in western settings but they do not reflect the transitional setting in which Chinese firms operate.

Financial intermediaries in China operate with major financial constraints and there are major institutional differences that prevent them from performing their role fully. All these factors affect the leverage decisions of firms that cannot be explained by the Trade-off model or the POT. It should also be taken into account that the Trade off and the Pecking Order Theory were derived from atomistic shareholders in western markets. Hence these theories might indeed not apply in China where the institutional and economic environment is very different than that prevailing in the west.

SECTION B

Large firms differ significantly from small and medium-sized firms. In this section of Chapter 2, we mainly concentrate on firms that have no access to external equity but can have access to debt[15]. These firms are generally small and medium-sized firms. More specifically, the focus will be on firms that cannot issue shares on stock markets

[15] These firms can only have access to private debt and equity markets.

and we will study how this affects their financing decisions. In section 2.5 we discuss the various ways of defining small and medium-sized firms (SMEs). Section 2.6 investigates the major sources of financing of SMEs while section 2.7 reviews the literature on the financing of these firms. Section 2.8 provides a survey of the relatively few studies that have been carried out on capital structure decisions of small and medium-sized firms that do not have access to stock markets.

2.5 SMALL AND MEDIUM-SIZED FIRMS

Financial theory has largely concentrated on quoted firms, that is, firms that have access to stock markets. The main reason for this is that information on listed firms is readily available as reporting accounting and financial information, for these firms, is a statutory requirement. Financial research has ultimately been concentrated only on firms quoted on the stock market. As argued by Ang (1991), financial theory has largely ignored the small business sector. Hulbert (2001) finds that where research has been conducted on 'small firms,' these 'small firms' have mainly been a group of listed firms having smallest market capitalization or smallest sales. It should be noted that even the smallest of listed firms are quite large when compared to unquoted firms.

Furthermore, as noted by Michaelas et al, (1999) most empirical studies on capital structure use data on firms that would be classified as large by any definition of business size. According to Hulbert (2001), small firms differ from large firms in a number of ways. Small firms are normally owned by the principal owner and they usually have limited access to capital markets. Also, small firms may suffer more from information problems than their larger counterparts.

The UK has a large and sophisticated financial sector with highly developed financial institutions, markets and infrastructure. Some UK firms are quoted on the stock market and can issue equity. On the other hand, small and medium-sized firms (SMEs) who do not have access to external capital markets also play a very significant role in the UK economy. According to the Department of Trade and Industry (DTI) in the UK, there are around 3.8 million registered SMEs out of which about 1.2 million SMEs employ one or more employees. The rest are one-person businesses.

Undoubtedly, small firms play a key role in the UK economy. According to the Small Business Service (SBS) which forms part of the Department of Trade and Industry (DTI), in the United Kingdom, in the year 2002, small businesses including those without employees, accounted for over 99% of the UK's 3.8 million businesses. Small businesses accounted for 56% of employment, that is, around 12.6 million people. The total UK turnover of these firms is around £1,100 billion which represents 52% of total UK turnover (Small Business Survey, 2003b).

In this study, we try to understand the capital structure decisions of these firms by investigating how firms decide to finance their activities. A major part of this study will concentrate on finding whether SMEs in the UK are financially constrained. This allows us to better understand the financing behaviour and identify some problems that SMEs may face in getting access to finance.

2.5.1 **DEFINITIONS OF SMALL AND MEDIUM-SIZED FIRMS (SMEs)**

One of the first issues we need to investigate is how we define SMEs and how different they are from large firms. There is no one definition of an SME in the United Kingdom. The Department of Trade and Industry (DTI) describes a small firm as one that has less than 50 employees; a medium-sized firm as one that has more than 50 but less than 250 employees and a large firm as one that has more than 250 employees.

The European Commission describes a small firm as having a turnover of less than € 7 mn, a balance sheet of less than € 5mn and less than 50 employees. The medium-sized firm is described as having a turnover of more than € 7 mn but less than € 40 mn , a balance sheet of more than € 5mn but less than € 27mn and more than 50 but less than 250 employees.

The Companies Act 1985 reviewed in the year 2004, describes a small company as having a maximum turnover of £ 5.6 mn and a balance sheet of not more £2.8 mn or a maximum number of 50 employees. A medium-sized firm is described as having a turnover of more than £ 5.6 mn but less than £ 22.8 mn, a balance sheet of more than £2.8 mn but less than £11.4 mn and having between 50 and 250 employees. Any firm exceeding these values is classified as 'large'. The British Bankers Association describes small businesses as those that have a turnover of up to £1mn.

As it can be seen, there is no one definition of what a small, medium or large firm is. One factor that seems common in most of these definitions is the number of

employees. However, in our study we cannot rely on the number of employees to differentiate among the various classes of firms. This is due to the fact that in our dataset, a large number of firms have missing values of employment. Small and medium-sized firms are not required by law to disclose their accounts to the public. Due to this, some firms have missing values for employment and we have reservations about using employment as our classification criteria to distinguish between small and medium-sized firms. However, as discussed in Chapter 3, there are other indicators that can be used as a measurement of size.

In part of this study the focus is also on firms that have no access to external/public equity markets. Studies that have tried to investigate SMEs have in some cases considered firms that were in fact able to issue external equity or gain access to stock markets. It is important to consider among the class of unquoted firms how small and medium-sized enterprises are different from their large counterpart even if all of them do not have access to stock markets.

Next, we consider how different SMEs are from large firms. The Bolton report (1971) and the Wilson report (1979) have been the first studies that have investigated small firms in the UK.

The Wilson report (1979) finds that:

- SMEs are relatively risky.
- They expect to face higher interest payments and more stringent conditions than large firms.
- Banks are more cautious towards smaller and newer SMEs.
- SMEs face a shortage of start-up capital.

Due to the fact that these studies are dated more than 30 years from now, their findings may not necessarily hold true in the present.

Hughes (1997) compares the financial structure and profitability of large and small companies over the 1987-1989 period both in the manufacturing and non-manufacturing sector. He defines 'large' companies as those ranked in the top 2,000 in terms of capital employed in the UK non- financial corporate sector which consists primarily of quoted companies. From the remainder of the corporate sector, Hughes (1997), picks one out of every 300 firms and defines this sub-sample as 'small.' He finds that small companies have a low ratio of fixed to total assets, a high proportion of debt, more current liabilities and rely more on trade and credit debt. He also finds

that manufacturing companies seem to be more geared than non-manufacturing companies.

Berger and Udell (1998), argue that small businesses suffer from what they term as 'informational opacity.' Small firms are not required by law to disclose information about their financial situation or their growth prospects; hence they are regarded as being informationally opaque. Due to this, the "lemons" problem is more acute for small firms and thus adverse selection and moral hazard are more pronounced in their case. We next consider the major sources of funding for SMEs.

2.6 MAJOR SOURCES OF FINANCE FOR SMEs

TABLE 2.2 : SOURCES OF FINANCE

Sources of Equity:
Principal owner
Angel Finance
Venture capital
Other equity

Sources of Debt:
Financial Institutions
- *Commercial Banks*
- *Finance Companies*
- *Other Financial Institutions*

Non Financial Business and Government
- *Trade Credit*
- *Other Business*
- *Government*

Individuals
- *Principal Owner*
- *Credit Card*
- *Other Individuals*

Source: Berger and Udell (1998) p168.

Asymmetric information or more precisely informational opacity typically influence the sources of funding of firms. Among the first studies that try to provide a comprehensive survey of the financing of small businesses, Berger and Udell (1998), find that small businesses depend on both (internal) equity and debt. They identify 13 sources of finance 4 of which they categorise as belonging to the equity class and the rest are sub-divided in 3 categories of debt. This is illustrated in Table 2.2 above. As shown in the table above, the equity group consists of finance provided by the

principal owner, angel finance, venture capital and other equity consisting of capital provided by members of the start-up team, family and friends.

The market of angel capital consists of individuals providing risk capital directly to small, private and often start-up firms (Prowse,1998). According to Berger and Udell (1998) angels are high net worth individuals who provide direct funding to early stage new businesses. Prowse (1998) further argues that angels do not form part of the principal entrepreneur or in his immediate family. Angels are often in the second round of financing of a start-up, that is, after the principal owner has exhausted her/his financing capacity and that of his family and friends. However, very little is known about the market's size, scope and the type of firms that raise angel finance and the types of individuals who provide it, especially as angel finance is provided in a very informal environment.

Potential entrepreneurs have new ideas but lack resources as well as commercial experience (Keuschnigg and Nielsen 2004). Start-ups require considerable funds to invest in capital and to undertake research and development. Since entrepreneurs are not wealthy enough, they thus turn to individuals who have the money and the experience. These individuals are the venture capitalists. They can be regarded as investors who invest in entrepreneurs who need financing to fund a promising project or company (Kaplan and Stromberg, 2001). Venture capitalists do not normally receive the benefits of control. Their function is limited to evaluating, screening, monitoring and providing advice and management expertise. Berger and Udell (1998), regard venture capital as capital provided in a more formal market than angel finance.

Berger and Udell (1998) regard funding provided by financial institutions as being the main category of debt. These financial institutions consist primarily of commercial banks, followed by finance companies and other financial institutions. Following this, the second category of debt is debt provided by non-financial and government sources. This consists primarily of trade credit[16]. The third category of debt is debt provided by individuals.

Using US data from the 1993 National Survey of Small Business Finances, Berger and Udell (1998) break down the size and age of firms and find that the largest source of finance for the firms are from the principal owner followed by commercial

[16] Trade credit can be defined as credit extended by a firm's suppliers when the supplier sells the firm goods or services on credit.

banks and trade credit. In fact these three sources account for over 70% of total funding of the firms studied. The findings of Berger and Udell (1998) seem to agree with the findings of Pettit and Singer (1985). They find that smaller firms tend to use more debt financing and they rely more on internal funds and loans from stockholders to finance operations and they do not use much external equity relative to large firms.

An important source of financing for SMEs overlooked by Berger and Udell (1998) is factoring. Under factoring, receivables are purchased by the factor rather than used as collateral in a loan. In simpler words, the firm is able to sell its receivables to a factor. The effect of this is that the firms can obtain part of financial resources immediately that were previously tied up in receivables. Factoring involves the shift of title and ownership from the seller to the factor.

A factoring agreement covers a broad range of issues associated with the relationship between the factor and the client. Bakker, Klapper and Udell (2004) provide a comprehensive study of the impact of factoring in Eastern Europe[17]. Factoring can be described as a form of asset-based finance where the credit extended is based on the value of the payments owed by the borrower's customers (Bakker, Klapper and Udell, 2004). According to them, factoring is useful in developing countries especially with weak lending laws. Since factoring is dependent on the quality of the borrower's accounts, Bakker et al (2004) consider that factoring may be especially attractive to high-risk SMEs.

Hughes (1997) identifies the following sources of financing for SMEs in the UK: banks, venture capital, hire purchase/leasing, factoring, customers/suppliers, partners/working shareholders, other private individuals and finance obtained from other sources. He analyses the balance sheet structure, gearing and profitability of manufacturing and non-manufacturing companies (excluding financial companies) in the UK over the 1987-1989 period. He further sub-divides the companies into 'small' and 'large'. He finds that small firms normally have low profitability and are thus heavily reliant on retentions to fund investments. However, the most important source of financing for firms are banks. The other important sources of financing of firms are hire purchase/leasing and funds provided by partners/working shareholders.

[17] These issues include the effective date of agreement, initial terms, renewal options, exclusivity of the factoring relationship, invoices required to be factored, minimum factored volume requirement, maximum cash advances available to client, purchase price of invoices, percentage of purchase price to which the client is entitled to be paid in advance, minimum required reserve percentage or amount and termination provisions (Berger and Udell, 1998).

He also finds that factoring and trade credit are important sources of financing of SMEs in the UK.

However, it is sometimes difficult to dissect the sources of funding of firms. As proposed by Berger and Udell (1998) small businesses may be thought of as having a financial growth cycle in which financial needs and options change as the business grows, becomes more experienced and more informationally transparent. At the start-up stage firms are informationally opaque and thus cannot gain access to external capital. They rely entirely on insider finance, trade credit and angel finance. As they grow and become less informationally opaque they can now gain access to external finance. Therefore, according to Berger and Udell (1998) rather than looking at the sources of funding separately, we should focus on a sequencing of funding over the growth cycle of the firms.

Baldwin, Gellaty and Gaudreault (2002), study the characteristics of new small Canadian firms. They base their study on an elite group of small firms that have survived 10 years of operation. They analyze a sample of 3,000 small Canadian firms born between 1983 and 1986 that were still in operation in 1996. They find that only 20% of all small firms that start-up actually cross this threshold. Baldwin, Gellaty and Gaudreault (2002), identify 5 financing instruments namely retained earnings, share capital, short-term debt, long-term debt and other. They also identify 4 sources from which finance can be obtained that include internal sources, financial institutions, innovative sources and other.

As illustrated in Table 2.3 below, Baldwin et al (2002), distinguish between internal and external sources of finance. Internal sources consist of financing obtained from retained earnings, owner managers and employees. External financing sources are broken down into 3 categories namely financing obtained from financial institutions, innovative sources and others.

Small firms normally face capital market restrictions and thus they rely more extensively on internal finance. Baldwin, Gellaty and Gaudreault (2002), find that over 50% of firms in their sample rely solely on internal sources of which retained earnings represent 39% while capital from owners and managers represent 12%. The majority of the remaining financing is supplied by banks and trust companies.

TABLE 2.3: FINANCIAL INSTRUMENTS AND SOURCES	
FINANCING INSTRUMENTS	FINANCING SOURCES
Retained Earnings Share Capital Short-term Debt • Short-term secured and unsecured debt Long-term Debt • *Long-term secured and unsecured debt* Other • *Trade Credit* • *Convertible Debentures* • *Contract Financing* • *Investment Tax Credits* • *Grants* • *Other*	Internal Sources • *Retained Earnings* • *Owner managers* • *Employees* Financial Institutions • *Banks and Trust companies* Innovative Sources • *Related Firms* • *Joint Ventures, Strategic alliances* • *Venture Capitalists, Merchant banks, capital groups* • *Silent Partners* • *Public Markets* Other • *Suppliers* • *Customers* • *Pension firms and Insurance Companies* • *Government* • *Other*

Source : Baldwin, Gellaty and Gaudreault (2002) p3.

2.7 LITERATURE REVIEW: SMALL AND MEDIUM-SIZED FIRMS

Most of the research undertaken regarding capital structure has been conducted on large firms, which usually have access to capital markets and therefore can issue equity. In this section, we will review some of the studies that have tried to study the capital structure/financing decisions of SMEs both in the developed and developing countries.

Romano et al (2001), study the capital structure decisions of small businesses and find that a large number of factors influence SME's owner-managers financing decisions. But one important factor is firms' attitudes towards the utility of debt as a form of funding. According to Roman et al (2001), cultural, entrepreneurial, personal preferences and attitudes play a major role in capital structure decisions of SMEs.

Other factors such as views regarding control, the age and the size of the firm also play a role.

According to Holmes and Kent (1991), SMEs are characterised by 2 factors: they cannot issue equity and are concerned about ownership and control. Small firms usually do not have the option of issuing additional equity to the public. Even if they were able to issue private equity, managers of SMEs would restrain from doing so as issuing equity would lead to a dilution in ownership and control. Therefore, managers of SMEs will usually prefer to go for debt financing, mainly comprising of bank financing. On the other hand, managers of larger firms usually consider a broader range of funding options.

Unlike large firms, SMEs are restricted in their funding options. Therefore, a new hierarchy of sources of finance for SMEs can be defined. In this new hierarchy of sources of finance for SMEs, there are three sources of finance, internal finance, debt finance and new capital contributions. Large firms that have access to capital markets are able to issue equity; however, SMEs do not normally have access to this form of finance.

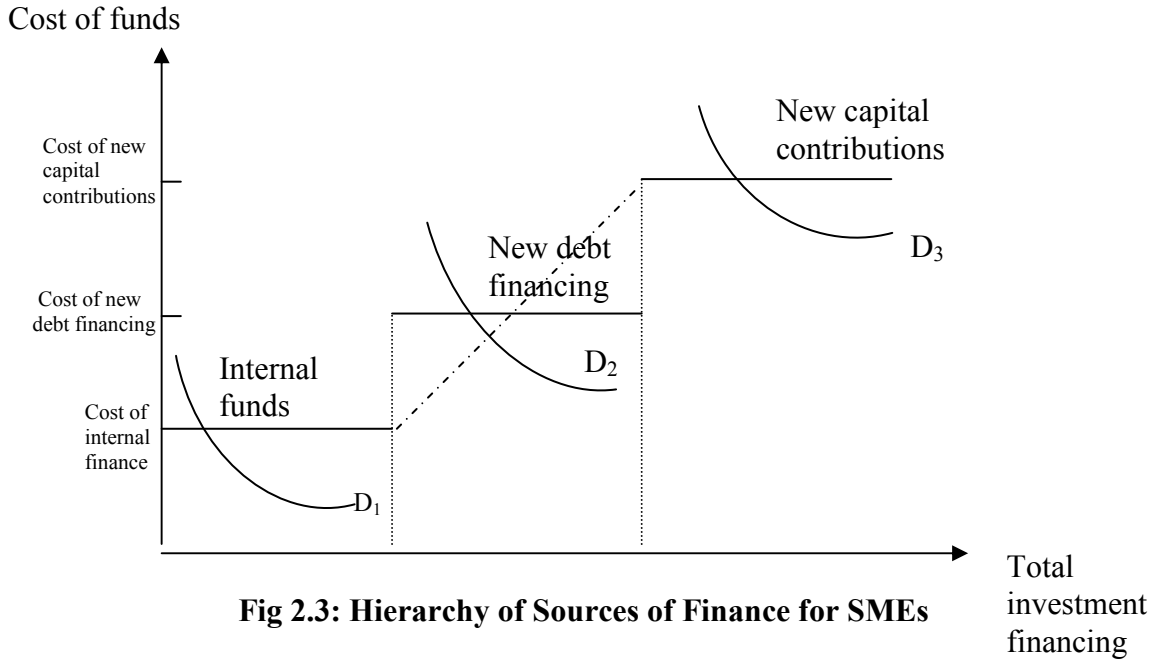


Fig 2.3: Hierarchy of Sources of Finance for SMEs

According to very recent studies, the POT may be pertinent to both large and small and medium-sized enterprises. The theory may be able to explain the observed differences between the SMEs and large enterprises' capital structures. Hence, in the hierarchy of sources of finance for SMEs we replace the 'equity issue' term with 'new

capital contributions'. 'New capital contributions' refer to additional capital contributions from existing owners of the firm. Ang (1991), proposes a pecking order of financing preferences for SMEs that is illustrated in Figure 2.3 above.

D_1, D_2 and D_3 represent investment demand schedules. When investment demand is low at D_1, investment is financed with internal funds, which is relatively cheaper. If investment demand is at D_2, after exhausting internal funds, external funds are used namely in the form of debt finance. Finally, if investment demand is very high at D_3, new capital contributions are used after internal and debt financing capacity have been exhausted.

Internal finance is the cheaper source of finance as it is not plagued by problems of asymmetric information and this is the first preferred source of finance for SMEs. Most importantly, using internal finance does not lead to a dilution in ownership. As suggested by Holmes and Kent (1991), managers of SMEs are usually very concerned with the ownership and control of firms and they do not like to take actions that would lead to a dilution in ownership and control. Following internal finance, the second preferred source of finance is debt financing as debt does not lead to a change in ownership, structure or control. The last alternative is new capital contributions that rank behind debt finance. The cost of new capital contributions is higher taking into account that it creates dilution in ownership and control in firms.

This hierarchy can also be explained in terms of an asymmetric information framework. SMEs are usually informationally opaque. The cost of external finance is usually higher than the cost of internal finance. Debt is cheaper than new capital contributions as financial intermediaries are able to screen and monitor the firms they lend funds to. This relationship benefit associated with financial intermediaries is clearly shown in the study of Hoshi, Kashyap and Scharfstein (1991). They show that Japanese firms that belong to a 'kereitsu' are able to benefit from their relationship with banks. Firms with close ties with banks are able to obtain funds even when they are financially distressed. Finally, the cost of new capital contributions is highest as the contributors are in the dark regarding the financial and growth prospects of the firm and thus demand a higher return on their investment.

Berger and Udell (1998), on the other hand, propose that small business finance can be thought of as having a financial growth cycle, in which financial needs and options change as the business grows. For small businesses, informational opacity is a major issue and thus smaller, younger and more informationally opaque firms

initially rely on sources of funds such as insider finance, trade credit, and/or angel finance[18]. According to them firms evolve through a 'financial growth cycle.'

2.8 REVIEW OF RECENT EMPIRICAL STUDIES: SMEs

Research regarding the financing of SMEs is relatively new. As mentioned before, research has mainly focussed on large public corporations as data is relatively easy to obtain for these firms while data for unquoted firms is very difficult to obtain. The little research that has been done on SMEs has mainly relied on data obtained from surveys. Below, we provide a review of some of the studies that have attempted to study the financing behaviour of SMEs.

(i) STUDIES USING US DATASETS

Berger and Udell (1998) find that in the United States, about 40% of small business loan dollars are guaranteed and/or secured by personal assets. It is often difficult to distinguish between personal finances and business finance of small business owners. The distinction between insider finance (provided by members of the start-up team, family and friends) and external finance is not clear-cut. "Insiders often give personal guarantees or pledge personal collateral against external debt provided by financial institutions," (Berger and Udell, 1998 p660). Thus, it is difficult to distinguish in a clear-cut way between internal and external finance. It may therefore, not be possible to stratify the sources of finance of small businesses as proposed by the POT .

(ii) STUDIES USING EUROPEAN DATASETS

Ozer and Yamak (2000), examine the financial source preferences of small businesses in Turkey. They conduct a study on 101 small hotels using a structured questionnaire. They focus on three main instances when a firm is in need of funds: how to finance the start-up, ongoing operations and future investment. They find that unlike SMEs in developed economies such as the UK and the US, SMEs in developing countries such as Turkey do rely a lot on bank financing. However, in the specific case of start-up, Ozer et al (2000) find that the main source of funding appears to be personal funds while ongoing operations are financed with retained earnings and future investment is funded by ploughing back profits. In all three cases, it can be concluded that the

[18] Angel finance is obtained from "angels;" individuals who provide direct funding to new businesses.

sample of firms prefer some form of internal finance, which give some support to the POT.

Sogorb-Mira and Lopez-Gracia (2004), study a sample of 6,482 Spanish SMEs during the 5 year period covering 1994-1998. They try to test both the Trade-off and the POT and try at the same time to identify the main factors that influence SMEs financial policy. To test the Trade-off theory they use both the two stage least squares (Anderson and Hsiao, 1982) and GMM (Arellano and Bond, 1991) methodology. Sogorb-Mira and Lopez-Gracia (2004) find that the Spanish SMEs tend to have a target or an optimum leverage ratio and they also tend to have a high adjustment parameter implying that they adjust quite fast to their target debt ratios. Additionally, the firms tend to increase debt in their capital structure when they are faced with increased tax rates.

However, Sogorb-Mira and Lopez-Gracia (2004) find no evidence that firms increase their debt financing when they need funds. They also find that cash flow is negatively related to firm leverage implying that the more cash a firm has the less it is likely to turn towards debt financing. Age seems to have an important influence on the financing decisions of Spanish SMEs. Older SMEs are likely to have built up significant internal resources and do not depend on debt unlike younger SMEs.

(iii) STUDIES BASED ON OTHER COUNTRIES

Zoppa and McMahon (2004), try to examine to what extent the POT is able to explain the financial structure of Australian SMEs. They use data pertaining to the manufacturing sector for three financial years, from 1995 to 1998. They model the behaviour of financial structure on a set of control variables that include characteristics of SMEs. These characteristics include factors such as profitability, enterprise growth, enterprise size, enterprise age and other enterprise characteristics. Using a logit analysis, they find that their results are consistent with the POT of business financing.

Cassar and Holmes (2003) study the capital structure and financing behaviour of SMEs in Australia. In their study, they use data from the Business Longitudinal Survey developed by the Australian Bureau of Statistics. The surveys carried out in 1994-1995 provide information on the growth and performance of Australian businesses. Cassar and Holmes (2003) focus their study on a sample of 1,555 firms.

In particular, they try to investigate the variables that influence capital structure as proposed by the POT and the Trade-off Theory.

They use five measures of capital structure namely leverage (*LEV*), long-term leverage (*LONG*), short-term leverage (*SHOR*), an outside financing measure (*OUI*) and a bank financing (*BANK*) measure. *LEV* is total debt divided by total assets; *LONG* represents long-term leverage which by definition is debt that has longer maturity and duration and involves greater contractual obligations and screening process. SHOR is defined as the difference between leverage and long-term leverage and captures short term leverage. OUI is an outside financing measure that helps examine issues of agency cost and asymmetric information; BANK is a bank financing measure which represents the use and level of bank financing by firms.

The model used is specified as:

$$Y = \beta_0 + \beta_1 SIZE + \beta_0 NONA + \beta_0 ROA + \beta_0 RISK + \beta_0 GROW \qquad (2.\ 22)$$

Where *SIZE* is the log of total sales, *NONA* is non-current assets divided by total sales (which acts as a measure of asset structure), *ROA* is the return on assets before interest (which is a measure of profitability), *RISK* is the absolute coefficient of variation in profitability, *GROW* is the growth in sales. The dependent variable Y represents the capital structure measure which can be either LEV, LONG, SHOR, OUI or BANK.

The results obtained by Cassar and Holmes (2003) suggest that there is a positive relationship between capital structure and size, implying that the larger a firm is the more levered it is. The relationship between capital structure and NONA seems to vary. There is a positive and significant relationship between the measures of capital structure and the GROW variable. However, there is a negative relationship between the measures of capital structure and the ROA variable. No support is found for risk in influencing either the level of debt or the financing of SMEs. In some cases the relationship between risk and debt is even positive. The results obtained seem to indicate that asset structure, profitability and growth are important factors that influence the capital structure and financing behaviour of SMEs in Australia. Also, the study seems to indicate that capital structure theories like the POT and the Trade-off Theory are applicable to SMEs.

Pissarides, Singer and Svejnar (2003) analyse the objectives and constraints of SMEs using data from a survey of 437 CEOs in Russia and Bulgaria. This is interesting especially as these formerly centrally planned economies were characterized by a total lack of privately owned firms and the presence of SMEs is a relatively new phenomenon. SMEs in these countries are normally believed to face economic, legal and financial obstacles. Using data from their survey and the multinomial logit methodology, Pissarides et al (2003) investigate the constraints that entrepreneurs in Russia and Bulgaria face and try to rank these constraints. They find that the lack and high cost of external financing is regarded as being the most important constraint while bureaucracy (extralegal payments, problems with obtaining licenses and dealing with government institutions) is not regarded as being important. In particular, the level of interest payments is regarded as being the most important.

A large number of factors have been identified in the literature that influence capital structure decisions of firms. However, till now no consensus has been reached. In this chapter we have concentrated on how among all the theories proposed, the POT and the TOT are able to explain financing decisions of firms. The theoretical and empirical literature regarding large firms and SMEs has been considered separately. The theoretical literature took off in the early 1980's but quite surprisingly, the empirical literature has only taken-off quite recently. Studies on the financing decisions of firms have covered a wide range of countries and both small and large firms. These studies have provided mixed results. Some studies favour the POT while others do not. Our objective is to add a new dimension to the literature and examine how financial constraints affect the financing decisions of firms.

CHAPTER 3

HOW IMPORTANT ARE INTERNAL FUNDS? EVIDENCE FROM LISTED AND UNLISTED FIRMS IN THE UK

PART 1

LISTED FIRMS

3.0 INTRODUCTION

Studies on capital structure have mainly investigated factors that influence the debt-equity mix of firms (Myers, 2001). Recent studies on capital structure have focussed on factors that affect leverage of firms as it has been widely recognised that after internal finance, debt is the most preferred source of finance, while equity is the last chosen mode of financing. The financial constraint literature has mainly investigated how financial constraints affect the cash flow sensitivity of investment. The main innovation in this chapter is that we merge these two strands of the literature and we study how financial constraints affect the relationship between leverage and cash flow.

The aim of this study is twofold. First, we investigate what factors influence the capital structure decisions of listed firms in the UK, namely focussing on the relationship between leverage and internal finance. Second, we investigate how financing constraints affect the capital structure decisions of firms. In other words, we examine how firms change their leverage when faced with changes in their internal financing depending on their financial status.

Myers (2001) reports that in 1999, most of the aggregate investment undertaken by firms in the US was financed from internal cash flow and that external financing in most years covered less than 20% of investment. Additionally, the major part of this external financing came from debt finance rather than equity finance. Our study innovates on prior literature. The main innovation in this paper is that we study the relationship between debt and cash flow, the two main sources of finance for most firms by taking into account financial constraints that firms might face.

In this chapter we examine the leverage decisions of firms in the UK, while the majority of studies in this field have mainly examined firms in the US, due to easy data availability. We study both quoted and unquoted firms in the UK and determine

how they decide between internal financing (using cash flow) and leverage, as these are the two major sources of financing of firms in the UK. In addition to this, we use an adapted version of the model proposed by Almeida and Campello (2005) and examine how financial constraints affect the relationship between cash flow innovations and leverage. In Part I of this chapter, we study the leverage decisions of listed firms in the UK. In Part II, we study the leverage decisions of unlisted firms in the UK. This gives an overall picture of how different types of firms make their financing decisions.

To study how financial constraints affect the leverage decisions of listed firms in the UK, we use a number of criteria conventionally used in the literature to distinguish between financially constrained and unconstrained firms. These criteria include the distribution of real assets, coverage ratios and the level of indebtedness of firms. We find that overall the main factors that affect the leverage of listed firms in the UK are internal funds, size, investment and growth opportunities. We also find that financial constraints affect the relationship between debt and internal funds (cash flow). Similar to the results obtained by Almeida and Campello (2005), we find that when real uses of funds are correlated with variations in internal funds, the sensitivity of debt to variations in internal funds is less negative for constrained firms than financially unconstrained firms.

The rest of Part I is organised as follows: in section 3.1 we discuss the background of our research and explain how it is related to different strands of literature. Following this in section 3.2, we develop a simple theoretical model that illustrates why there exists a financial hierarchy in the sources of finance. In sections 3.3 and 3.4 respectively, we discuss the empirical background and features of our dataset. In section 3.5 we discuss the classification schemes that we use to distinguish between financially constrained and unconstrained firms. In section 3.6 we explain our regression specification and estimation methodology. Section 3.7 presents our descriptive statistics. Section 3.8 discusses our regression results. Finally, section 3.9 concludes.

3.1 THEORETICAL BACKGROUND

Studies on the capital structure decisions of firms have mainly focussed on the US. Shyam-Sunder and Myers (1999), Fama and French (2002) and Frank and Goyal (2002), study the capital structure decisions of firms based in the US. Very few

studies have examined the capital structure decisions of firms in the UK. Some exceptions are Bennet and Donelly (1993), Marsh (1982), Benito (2003) and Panno (2003). Recent studies on capital structure decisions of firms have concentrated primarily on contrasting the two main theories of capital structure namely the Trade-off Theory (henceforth TOT) and the Pecking Order Theory (henceforth POT).

Modigliani and Miller (1958) stated that when capital markets are perfect and frictionless, firms are indifferent between alternative sources of financing. However, even today, capital markets are characterised by imperfect information. Faced with imperfect markets and costly external finance, firms spend a lot of time and resources in deciding what sources of finance to use. Related to this literature is the literature on financial conservatism. In their survey of financial managers, Graham and Harvey (2001) found that financial flexibility is a major objective when deciding what sources of finance to use. One way for firms to be financially flexible is to use internally generated funds when they are able to do so and avoid the use of external finance.

Capital structure theories have tried to explain how firms undertake financing decisions. Recent studies on capital structure decisions of firms have concentrated primarily on contrasting the 2 main theories of capital structure namely the TOT and the POT. The POT, first proposed by Myers (1984) and Myers and Majluf (1984) prescribes a strict ordering or hierarchy of finance: firms use internal finance first, then debt and only when such options are exhausted, equity finance is used. However, according to the TOT, an optimal capital structure is achieved by "trading-off" the costs and benefits of debt (Berens and Cuny 1995, Fama and French 2002, Shyam-Sunder and Myers 1999). According to the TOT, taking debt ensures that managers do not use free cash flow for their own perquisites. The TOT also assumes the existence of a target debt level contrary to the POT.

The two papers closely related to this study are Benito (2003) and Almeida and Campello (2005). Benito (2003) examines the capital structure decisions of quoted firms in the UK using firm level data over the 1973-2000 period. He tests the TOT and POT and finds that the POT is better able to explain capital structure in market-based[19] United Kingdom. His results suggest that there exists a positive relationship between debt and investment and a negative relationship between debt and cash flow which are mainly consistent with the POT. He estimates both GMM

[19] In a market-based system, markets play a positive role in encouraging competition and creating greater incentives for firms to undertake profitable projects.

(Arellano and Bond, 1991) and random effect probit models and finds that firms in the UK follow a pecking order in their financing patterns.

The study of capital structure attempts to explain the mix of securities and financing sources used by corporations to finance real investment (Myers, 2001). Modigliani and Miller (1958) show that under the perfect capital markets assumption, financing has no material effects on the value of the firm or on the cost or availability of capital. However, once we drop the perfect capital markets assumption, financing clearly matters. Taxes, differences in information, agency costs matter and therefore the source of financing matters as well.

According to Modigliani and Miller (1958), the cost of capital is the central determinant of the level of investment. The central proposition of the Modigliani-Miller theorem is that how a firm finances its investment does not have an effect on the cost of capital. Studies that have built upon the Modigliani-Miller theorem have subsequently shown that the financial structure of a firm does matter due to three different reasons. Firstly, debt and equity have differential tax treatment that suggests that corporate tax policy does matter. Secondly, bankruptcy considerations can be quite important (Robichek and Myers,1965, Kraus and Litzenberger, 1973). Thirdly, the presence of asymmetric information causes decisions about financing to affect the value of the firm. In this case, financing decisions convey information to the investors (Myers and Majluf, 1984).

Other studies on capital structure include Jensen and Meckling (1976), Townsend (1979) Diamond (1984) Gale and Hellwig (1985) who show that capital structure provides incentives to management or allocates control to someone other than the management. Further studies include Ross (1976) who concentrates mainly on managerial incentives in the presence of informational asymmetries.

Most research on capital structure has focussed on the proportions of debt vs. equity observed on the right-hand sides of corporations' balance sheets. However, we believe that what ultimately influences the amount of external financing (debt or equity) used by a firm is determined by the amount of internal financing. The model that we develop in this chapter extends the pecking order model (Myers and Majluf, 1984) that has been proposed in the literature. We show that the most important factor that influences the amount of debt in a business is the amount of internal funds that the firm has at its disposal.

The reason why we focus on debt and not equity can be supported by many factors. First, numerous studies have found that equity issues are very rare among quoted companies (Marsh, 1982; Benito, 2003). Most transactions on stock markets are aimed at share buy-back or repurchase activities. Also because our empirical study is mainly based on firms in the UK, where share issuance is very minimal (Benito, 2003) we think it best to ignore equity issues[20]. A number of empirical studies on capital structure have found a negative relationship between the amount of debt and internal funds (usually proxied by cash flow). However, there has not been any significant theory to give theoretical support to this finding. In this chapter, we adapt the model proposed by Almeida and Campello (2005) to try to explain why this negative relationship exists.

3.2 IMPORTANCE OF INTERNAL FUNDS

"Most of the aggregate gross investment by US non-financial corporations has been financed from internal cash flow (depreciation and retained earnings). External financing in most years covers less than 20% of real investment and most financing is debt. Net stock issues are frequently negative: that is, more shares are extinguished in acquisitions and share repurchase programs than are created by new stock issues" (Myers, 2001, pp 82.) There are many established, profitable companies with superior credit ratings operating for years at low debt ratios, including Microsoft and major pharmaceutical companies. In the framework of capital structure, the pecking order theory can help explain this behaviour and explain why the bulk of external financing comes from debt. It also explains why profitable firms borrow less.

Hoshi, Kashyap and Scharfstein (1990) find a high correlation between cash from old investments and the level of new investment among firms that rely on public debt as evidence that firms are sometimes unable to raise funds when they have good prospects, forcing them to rely on internal funds. Numerous studies have tried to show empirically the importance of internal funds. Many empirical studies on capital structure (Fama and French, 2002, Frank and Goyal, 2003) have indeed shown that cash flow is an important determinant of the level of debt in the capital structure of firms.

[20] See Section 3.7 for evidence that the firms in our sample do not rely on equity issues.

3.2.1 **FINANCIAL HIERARCHY IN THE SOURCES OF FINANCE**

We develop a theoretical framework that enables us to model financing behaviour of firms. In the first instance, we put forward a simple theoretical outline to explain the financial hierarchy that firms seem to follow in the Pecking Order Theory. In this section, we develop a simple framework for the Pecking Order Model along the lines of Johnson, Mcmillan and Woodruff (2002) that shows how a firm chooses between three different sources of finance available.

Our model includes three groups of agents, firms, banks and a securities market. To keep matters simple we exclude exotic financial options such as venture capital, angel finance, discounting and many others. Firms' capital structure choices are assumed to be the result of the interplay of aggregate demand and supply of funds. We extend the model developed by Johnson et al (2002) by including equity financing as a source of finance[21].

Firms' have sources of funds and needs for funds. They would prefer to finance all their needs with internal sources of funds. The reason for this is that internal funds are cheaper as asymmetric information makes external funds relatively more expensive compared to internal funds. There are significant costs associated with issuing debt or equity. Firstly issuing debt involves the payment of interest and if the firm is not able to repay back the debt then it faces potential bankruptcy. Equity issues are quite expensive to undertake as they involve significant flotation costs, legal fees and it also leads to a dilution in ownership. However, it might be the case where the demand exceeds internal funds, in which case external funds are required to meet the deficit. Externally, this deficit can be met from two possible sources which are from (bank) debt or by issuing securities.

The demand of funds depends on the ability of the entrepreneurs to retain any profits they make. We make the implicit assumption that firms always prefer to use internal finance and therefore as argued by Myers and Majluf (1984), financial slack can be used to avoid external financing.

The demand for funds is given by:

$$D^F = D(\pi, r^I, r^L, T) \qquad (3.1)$$

[21] Although equity finance is not really a major source of funds for firms in the UK, we include it nevertheless to ensure a broader application of our model to firms in other countries.

Where D^F is the demand for funds which is itself a function of π (profits, retained earnings, financial slack or liquid resources). r^I is the interest rate that entrepreneur can earn by investing the firm's profits outside the firm. It represents the opportunity cost of internal funds. r^L is the cost of debt. We make the usual assumption that $r^I < r^L$, which implies that there exists a wedge between the cost of internal and external debt finance. As evidenced by studies of Bernanke, Gertler and Gilchrist (1996) and Rajan and Zingales (1996) amongst others, the presence of information asymmetry and agency costs create this wedge between internal and external finance.

Outside lenders bear certain costs when they have to evaluate and monitor borrowers' actions. Hence the borrower has to pay an external finance premium on external finance. The external finance premium is always positive and is defined as the difference between the cost to a borrower of raising funds from lenders and the opportunity cost of using internal finance. Firms prefer internal finance since funds can be raised without sending adverse signal and this results in a pecking order. Let the cost of issuing securities be T which includes transaction costs (brokerage costs, legal fees, flotation costs) dividend payments and the fact that issuing securities has a number of implications on firm value.

If a firm uses all the three sources of financing then the demand for funds is equal to the sum of internal funds plus debt and equity financing as shown below:

$$D^F = \pi + L + E \qquad (3.2)$$

where L represent leverage (loans or debt) and E represents equity financing.

We now have three different types of situations which we illustrate below:

Case 1

$$D_F = \pi \qquad if \quad D_F \leq \pi \qquad (3.3)$$

Here, the entire demand of funds is met from internal sources.

For the purpose of our analysis we assume that firms are willing to reinvest 100% of their retained earnings. However, this might not necessarily be true. For instance, some firms might be unwilling to invest 100% of their internal funds. If internal funds are sufficient to meet the financing needs then the firm does not need to turn to external sources of funds.

However, if internal funds are not sufficient, then firms have to turn to external funds. As argued by Johnson et al (2002), "the difference in the cost of internal and external funds leads to a discontinuity between the investment of internally generated funds and the decision to seek external funds," (pp1347). If a firm reinvests internal funds then the rate of return has to at least equal to r^I while if the firm invests external funds then the firm will need to obtain a return of at least r^L for debt finance to be viable. Hence, this is what according to Johnson et al, (2002) makes a firm's decision to invest internally generated funds independent of the decision of getting access to external funds.

The preferred source of external finance would be debt (L). We have to take into account the inverse relationship between the cost and the amount of loan. At low levels of indebtedness firms might find it cheap to borrow. Lenders are also more willing to lend to firms that possibly are also investing internal resources as this signals to the lenders that the project is of good quality otherwise the entrepreneur would not be willing to invest internal funds in the project. This is illustrated as case 2 below.

Case 2

$$D_F = \pi + L \quad \text{if} \quad D_F > \pi \qquad (3.4)$$

As internal funds are not sufficient to meet the demand of funds, it is met by a combination of internal and debt finance.

However after a certain level, lenders will no longer be willing to lend (Stiglitz and Weiss, 1981). We go a step further and assume that internal funds and the maximum amount of (bank) debt that a firm can have are not sufficient to meet the demand of funds. Now, the firm will turn to the security market. It will decide to issue securities. Equity financing can be considered the more expensive source of finance. The costs of equity financing might include the transactions costs that firms might have to pay when issuing equity. The more important costs of equity financing that have been proposed in the literature are dilution costs as when a firm issues new securities, existing shareholders own a lesser proportion of the firm. Case 3 below illustrates this.

Case 3

$$D_F = \pi + L + E \quad \text{if} \quad D_F > \pi + L \qquad (3.5)$$

In this case the demand of funds is met by all the three possible sources of finance, internal funds, debt finance and also equity finance.

The three cases proposed above illustrate the Pecking Order Theory as in Myers and Majluf (1984). However, it can also be that in some other cases, the pecking order theory is violated, where firms would prefer to issue securities rather than using bank debt. For the case of start-up and high-growth firms for example, it is usually observed that these firms have more equity in their capital structure rather than debt. In this case, L is very low as the cost of obtaining bank debt is very high. This would violate the POT. Banks might not be willing to lend to these firms and these firms would possibly choose to issue equity first and then turn to bank debt. It has been shown by Hogan and Hutson (2005) that new technology based firms prefer to use outside equity to debt. However, this is not very common in the real world. If a firm is quoted on the stock market, this is an indication already that this firm is a 'good' firm. Banks would in fact be willing to lend to this firm. However, since this is not the objective of this chapter we do not go further in this discussion.

3.2.2 FINANCIAL CONSTRAINTS AND FINANCING DECISIONS

We use the model proposed by Almeida and Campello (2005) to examine how the sensitivity of external financing to internal cash flows differ across constrained and unconstrained firms. We start off from the firm budget constraint. Formally, if we define *LEV* as the total amount of external financing (in this case leverage/debt) that the firm raises in the current period, we have

$$LEV=I-W \qquad (3.6)$$

where I represents the firm's investment expenditures in the current period and W represents the total amount of internal funds (cash flow) the firm has available to spend in the period.

For (externally) financially unconstrained firms (those that do not face credit constraints when contracting external funds), investment spending is independent of the availability of profitable business opportunities. Let those firms' optimal spending be equal to I^{FB}. In sharp contrast, the investment spending of constrained firms will be a function of the availability of internal funds as costly external

financing makes investment spending endogenous to internal funds. This constraint is denoted as *I*(W)*.

Let's now consider the impact of an unexpected change in internal funds, ΔW, which is assumed to be orthogonal to real investment opportunities. A positive income shock ie, an increase in internal funds through increases in cash flow or profitability would lead these firms to reduce the amount of debt they hold. Since investment opportunities are unchanged unconstrained firms will absorb the shock by a corresponding variation in external financing of the opposing sign.

$$\Delta LEV^{UNCONS} = -\Delta W \qquad (3.7)$$

The above equation captures the idea that firms prefer to use internal funds. Therefore, if firms have high internal funds, they will demand lower external finance. A positive income shock, that is, an increase in internal funds through increases in cash flow or profitability will lead these firms to reduce the amount of debt that they hold. If firms are unconstrained, they will allocate the cash flow innovation towards paying down their debt. However, if firms are constrained in the credit market (financially constrained firms), a positive shock to internal funds will make them change their investment spending, these firms might optimally allocate the extra cash towards investment activities. In this case, financial factors will affect real decisions as the constrained firms had to give up some of their positive NPV projects due to lack of funds. This implies that these firms will optimally allocate the extra cash towards investment. This can be represented by:

$$\Delta LEV^{CONS} = -\Delta W + \Delta I^* \qquad (3.8)$$

which implies that following an income shock, firms have to adjust both their external financing and real investment.

According to Almeida and Campello (2005) there should be a negative relation between internal fund shocks and external financing. However the magnitude of this negative effect will be different for constrained and unconstrained firms. If the cash flow innovation is positive, then financially unconstrained firms will reduce their

external financing by a more significant amount than unconstrained firms[22]. Constrained firms are not able to reduce their external financing by a significant amount as they have to allocate part of that increase in internal finance towards investment (as they are financially constrained). This idea is captured by the following equation where we divide equations *3.1* and *3.2* by ΔW. We obtain the following inequality:

$$\frac{\Delta LEV^{UNCONS}}{\Delta W} = -1 < \frac{\Delta LEV^{CONS}}{\Delta W} = -1 + \frac{\Delta I^{*}}{\Delta W} \qquad (3.9)$$

The above inequality demonstrates that the sensitivity of debt to variations in internal funds is less negative for constrained firms than for unconstrained firms. All that is required is that real uses of funds are correlated with variations in internal funds when the firm is financially constrained. The hypothesis that we test is therefore:
H1: Faced with positive cash flow innovations, financially unconstrained firms reduce leverage by a more significant amount than financially constrained firms.

3.3 EMPIRICAL BACKGROUND

As mentioned before, very few studies have studied the capital structure decisions of quoted firms in the UK. Marsh (1982) focuses his study only on 748 issues of equity and debt made by UK companies over the 1959-1970 period and finds evidence in favour of the Trade off Theory (henceforth TOT). Bennet and Donnelly (1993) use data on listed UK firms from Datastream over a 12 year period from 1977-1988 and find that long-term debt is more representative of a firm's policy with regard to its capital structure. Benito (2003) uses UK data on 1,784 quoted companies over the 1973-2000 period and finds evidence in favour of the Pecking Order Theory (henceforth POT). Panno (2003) examines a sample of 87 cash issues of equity and debt made by UK quoted companies over the 1992-1996 period and also finds evidence in favour of the TOT.

Our study is importantly different from all these studies that have studied capital structure in the UK. First, our data coverage is over the 1968-2000 period,

[22] Financially unconstrained firms have already invested up to their first best level. So they have no use for the increase in cash flow. Constrained firms on the other hand invest below their first best level so they use part of the increase in cash flow for investment purposes.

therefore taking into account a longer and more recent period. Also, while Marsh (1982) and Panno (2003) use the Logit and Probit analyses to examine the financing choices of firms, Bennet and Donnelly (1993) use the analysis of variance (ANOVA) approach and Benito uses the GMM-system approach. In our study, we use the first differenced GMM estimator (Arellano and Bond, 1991) and focus mainly on debt. Below, we survey some recent studies on capital structure decisions of firms in the UK.

Bennet and Donnelly (1993) test different theories of capital structure by examining the cross-sectional variation in leverage among non-financial UK firms. They also provide some results on inter-industry variation in gearing. They use data from Datastream over the 1977-1988 period excluding financial and commodity groups and therefore their data covers 433 companies in 19 industries. Unlike previous studies, Bennett and Donelly (1993) include a volatility measure in their empirical specification. This volatility measure is calculated as the standard deviation of the first difference in earnings before interest and depreciation scaled by the average value of total assets employed over the period 1977-1988. The results suggest that non debt tax shield, asset structure, earnings volatility, size and profitability are the important determinants of leverage[23].

Walsh and Ryan (1997) use data on British owned public limited companies over the 1984-1991 period. They examine the impact of tax and agency considerations on the decision of firms to issue debt or equity. They test a binomial choice model based on actual issues of debt and equity by a sample of firms. They find that taken on their own, tax considerations appear to have a significant effect on the decisions of UK firms to issue debt or equity. However, when both agency considerations and tax considerations are taken into account, tax considerations seem to lose their importance in the choice between debt and equity issues. In other words, when firms decide to issue debt or equity they would consider the firm's free cash flow, its tangible assets and the volatility of its assets rather than tax considerations.

Ozkan (2001) studies the capital structure of firms in the UK. He uses data from Datastream consisting of 390 firms and 4,132 observations over the 1984-1996 period. He studies the partial adjustment behaviour of firms to a long-term debt ratio. Hence he investigates the potential determinants of target debt ratios and the

[23] Non debt tax shield is calculated as the potential deferred tax liability divided by total assets. In other words this represents the amount of tax that was deemed not payable.

nature of adjustment to these targets. He finds that firms have target debt ratios and they adjust to these targets relatively fast. His main finding is that firms adjust to their targets as the costs of being away from their target are important. He also finds that current liquidity and profitability of firms exert a negative impact on their borrowing decisions. However, he finds a positive relationship between past profitability and debt ratio. Other firm specific variables that influence leverage decisions in his study are non-debt tax shields and growth opportunities of firms while size does not seem to have an important effect.

Fattouh, Harris and Scaramozzino (2007) investigate the choice of leverage ratios of firms in the UK using a pooled cross-section of 6,614 UK firm observations for the period 1988-1998. They use the quantile regression method to examine if the effect of variables that affect leverage of firms are different at different quantiles of distribution. They estimate the coefficients at 7 quantiles, that is, the 5^{th}, 10^{th}, 25^{th}, 50^{th}, 75^{th}, 90^{th}, and 95^{th} quantiles using the same list of explanatory variables. They find that firms that experience an increase in internal funds reduce their leverage and this relationship is more pronounced for highly leveraged firms. This implies that firms that are highly levered reduce their leverage by a more significant amount when they experience an increase in internal funds. As for the effect of size, the results suggest that the effect of size on leverage is positive at lower quantiles while it is negative for firms in the upper quantiles suggesting that when smaller firms grow in size, they become more highly levered but as they become larger they start to reduce their leverage.

3.4 **DESCRIPTION OF DATA**

Most studies on capital structure of firms have considered all firms in the whole economy excluding the financial intermediation sector. The reason for this is that the capital structure of firms in the financial intermediation sector is heavily influenced by regulatory requirements[24]. The most important sectors in the UK (measured by GDP at basic prices) are the Manufacturing, Wholesale and Retail and the Financial Intermediation sectors. According to the DTI (2004), Manufacturing represents a sixth of the UK economy and it is responsible for the majority of the UK's exports. It

[24] For instance, Rajan and Zingales (1995) and Fama and French (2002) eliminate all financial firms such as banks and insurance companies from their sample because the leverage of these firms is strongly influenced by explicit investor insurance schemes such as deposit insurance and minimum capital requirements.

is also one of the biggest employment providers and responsible for the bulk of business research and development. This sector is a vital part of the economy and is still crucial for the country's prosperity now and in the future. Following Fazzari et al (1988) and Almeida et al (2003) we focus only on manufacturing firms while studying how financial constraints affect the relationship between leverage and cash flow. The manufacturing firms are grouped in different industrial sectors[25].

The dataset used in this study is from DATASTREAM which covers the 1968-2000 period. Our sample consists of 958 manufacturing firms which amount to 13,110 firm-year observations. Our samples have an unbalanced structure and the number of years of observation varies between 3 and 33[26]. We remove all outliers in the dataset by excluding observations that lie in the 1% tails of each regression variable (discussed in the next section).

3.5 **CLASSIFICATION SCHEMES**

To examine the effect of financial constraints on leverage decisions of listed firms, we need to distinguish between financially constrained and unconstrained firms. To do this, we closely follow the literature on investment and cash flow and use a series of classification schemes to distinguish between constrained and unconstrained firms. Various classification schemes have been used in the literature to distinguish between firms. Fazzari et al (1988) classify firms according to their dividend payout ratio, Whited (1992) classifies firms according to whether they have a bond rating or not. Carpenter and Guariglia (2003) use the number of employees to distinguish between firms.

In this study, we use a number of different criteria to differentiate among various classes of firms. We first divide our firms according to size where we use the distribution of real assets to distinguish between financially constrained and unconstrained firms. Second, we use the coverage ratio. Third, we use a measure of the level of indebtedness of firms. We allow firms to transit between classes and therefore our focus is on firm-years rather than simply years. We allow both entry and exit as the use of an unbalanced structure reduces to an extent potential survivor bias.

[25] The firms are grouped in the following 9 industrial sectors as follows: Metal and Metal Goods; Other Minerals and Mineral products; Chemicals and man-made Fibres; Mechanical Engineering; Electrical and Instrument Engineering; Motor Vehicles and Parts; other Transport Equipment; Food, Drink and Tobacco; Textiles, Clothing, Leather and Footwear and Other Manufacturing.

[26] See Data Appendix for details on the structure of our panel.

Survivorship is of particular importance in our study especially as finance plays a very important role in firm survival.

The first sample separation criterion that we use based on the size of the firm, is the distribution of real assets of the firms. Almeida et al (2005) also rank firms based on their assets and we use this criteria to distinguish between constrained and unconstrained firms. As proposed by Almeida et al (2005) the argument for size as a good observable measure of financial constraints is that small firms are typically young, less well-known and therefore more vulnerable to capital market imperfections. We use this measure to mainly take into account the ease or the difficulty with which firms might have access to debt. Firms that have a high level of real assets or tangible assets will be larger and have more collateral and we will expect these firms to have fewer difficulties in obtaining external finance as lenders will be more willing to lend to these firms.

We rank firms using the percentile methodology based on several criteria and this ranking is done on an annual basis, thereby allowing firm to switch between categories. Those firms that have their real assets in the lowest 25^{th} percentile of the distribution of the real assets of all firm-years are classified as financially constrained ($CONS_{it}$) as they are likely to be smaller firms, have low collateral and find difficulty in obtaining external finance/debt. All firms having their real assets in the top three quartiles of the distribution of the real assets of all firm-years are classified as financially unconstrained ($UNCONS_{it}$) as they are likely to be quite large in size, have quite high levels of collateral and should not face any difficulties in obtaining debt.

The second classification scheme we use is the coverage ratio of firms. We follow Guariglia (1999) and classify firms according to whether their interest cover ratio over the years is greater or smaller than five. This is according to Milne (1991) study based on interviews with banking practitioners in the UK. For the manufacturing sector in the UK, bankers start to feel concerned about the ability of a company to service or pay back its debt if its coverage ratio falls below a threshold of five. A coverage ratio of five for instance indicates that with its existing level of profitability, a firm will be able to pay the interest on its debt five times over. Hence we classify a firm that has a coverage ratio of less than five in a particular year as being financially constrained ($CONS_{it}$) while a firm that has a coverage ratio of more than or equal to five in a particular year is regarded as being financially unconstrained

($UNCONS_{it}$). We do this classification by year and we thus allow firms to transit between the constrained and unconstrained category over the years.

The third classification scheme we use is based on a measure of indebtedness. It is a fact that banks like to lend to firms that do not have high leverage while they do not like to lend to firms that are already highly levered. This is because in practice, firms that have low leverage can be regarded as having spare debt capacity. We classify those firms that have their leverage in the top 25^{th} percentile of the distribution of leverage of all firm-years as financially constrained ($CONS_{it}$) as these firms are already highly levered and lenders might be unwilling to lend to these firms. All firms having their leverage in the bottom three quartiles of the distribution of leverage of all firm-years are classified as financially unconstrained ($UNCONS_{it}$) as these firms have low leverage and lenders are likely to be willing to lend to these firms.

We use the above three classification schemes to distinguish between financially constrained and unconstrained firms. Firms that are large, have high coverage ratios or that have low leverage can be seen as being financially unconstrained firms. This implies that these firms would probably not face any difficulties in getting access to debt as lenders would be more willing to lend to these firms. On the other hand firms that are small, have low coverage ratios and are already highly levered would possibly have difficulties in having access to external funds as lenders would be unwilling to lend to them. The objective of our study is to show that when faced with positive cash flow innovations, firms that are financially unconstrained are able to reduce their leverage by a more significant amount than firms that are financially constrained. This is because firms that already have low leverage can use their positive cash flow innovations to further reduce their dependency on leverage while firms that are already highly levered are only able to reduce their dependency on leverage by a lesser amount.

3.6 EMPIRICAL SPECIFICATION AND ESTIMATION METHODOLOGY

3.6.1 MEASURES OF CAPITAL STRUCTURE

Various measures of capital structure have been considered in the literature, however most studies use a measure of leverage, which is a measure of the indebtedness of firms. There is no consensus on what measure of leverage should be used. A number

of studies consider some form of debt ratio (Shyam-Sunder and Myers (1999), Fama and French (2002) and Frank and Goyal (2002)). Some researchers use debt or the change in debt, others consider only long-term debt and while some consider book values, others consider market values.

Book ratios are very different from market ratios. Book values are calculated at historic values and are believed to be backward looking measures while market values are use current values and are believed to be forward-looking (Frank and Goyal 2002). Barclay and Smith (2001) find that there are major differences between forward and backward looking measures and they should not be treated as equivalent. What can be observed in the literature is that older studies tend to use book measures while more recent studies use market measures. For instance, Shyam-Sunder and Myers (1999) use both book measures and market measures.

Shyam-Sunder and Myers (1999) use the change in debt while Fama and French (2002) use a total debt measure calculated at book values that includes both long-term and short-term debt. Benito (2003) uses different measures of leverage which include a total debt measure and a net book leverage measure that subtracts cash flow from the total debt of the firm. Finally, he also uses a long-term debt measure. Frank and Goyal (2003) use a total debt measure, long-term debt and an inverse coverage ratio.

Following previous studies, in this study we consider four different measures of leverage which are total debt, long-term debt, short-term debt and net leverage (leverage net of cash). We consider a comprehensive leverage measure, total debt, which considers both long-term debt and short-term debt. The total debt measure (*LEV/A*) is calculated as total borrowing repayable in less than 1 year plus total loan capital repayable in 1 year or more divided by total assets.

To check for the robustness of our results we consider another measure of leverage that takes into account only the long-term portion of debt which is in this case long-term debt (debt with a maturity period of more than 1 year.) We also consider a short-term debt measure (debt that has to be repaid within 1 year). All debt measures in our study include loans, overdrafts, leasing and hire purchase.

3.6.2 **EMPIRICAL SPECIFICATION**

Titman and Wessels (1988) propose that firms select capital structures depending on attributes that determine the various costs and benefits associated with debt and equity

financing. Most studies on capital structure have used a model that is in essence similar to the return generating process assumed to hold in the Arbitrage Pricing Theory. Consequently, while studying capital structure, researchers have included in their studies, factors which they believed influenced the capital structure of firms. This factor analytic approach has been used in various studies and the main factors that can be found in a number of studies on capital structure include the variables as explained below.

Our reduced form model is along the lines of Miguel and Pindado (2001) which is as follows:

Let the target debt level be $(LEV/A)^*_{it}$. This target debt level depends on the factors discussed above, which are the cash flow, log of sales, investment, growth opportunities and the amount of tax paid by the firm.

$$(LEV/A)^*_{it} = \lambda_0 + \lambda_1 (CashFlow/A)_{it} + \lambda_2 (Log\ Sales)_{it} + \lambda_3 (INV/A)_{it} + \lambda_4 (Q)_{it} + \lambda_5 (Tax)_{it} + \varepsilon_{it} \quad (3.10)$$

where i indexes firms, $i=1,2,3....N$ and t indexes years, $t=1,2,3....T$

LEV/A is the book leverage (short-term debt plus long-term debt) of the firm scaled by assets, *CashFlow/A* is the firm's after tax and interest cash flow scaled by assets, *Log Sales* is the log of sales that controls for size effects, *INV/A* to control for the effect of investment. We rely on a *Tobin's Q* to control for growth opportunities and finally *Tax* controls for the effect of taxes on capital structure.

Assuming that capital markets are imperfect, firms have to face the existence of transactions costs and provided that they have a target debt level, they cannot automatically adjust to this target debt level. They, therefore follow the following target adjustment model (Gilson, 1997, Miguel and Pindado, 2001):

$$(LEV/A)_{it} - (LEV/A)_{it-1} = \alpha\ ((LEV/A)^*_{it} - (LEV/A)_{it-1}),\ 0 < \alpha < 1 \quad (3.11)$$

where $(LEV/A)_{it}$ is the actual debt level in the current period and $(LEV/A)_{it-1}$ is the debt level in the previous period and $(LEV/A)^*_{it}$ is the firm's target debt level. Transaction costs are captured by the α coefficient. α indicates adjustment to the target debt level. If $\alpha=1$, this indicates high adjustment due to no transactions cost. If $\alpha=0$ this indicates low adjustment to the target debt level and therefore the presence of high transaction costs.

If $\alpha=1$, (implying no transactions costs) so that adjustment is costless and perfect, then $(LEV/A)_{it} = (LEV/A)^*_{it}$ that is the actual debt level exactly matches the target debt level. However, if transactions costs exist, firms will not adjust to this target debt level immediately but would rather aim at partial adjustment as indicated by α. From equation (3.11) we find the actual debt level (given partial adjustment) as:

$$(LEV/A)_{it} = \alpha\ (LEV/A)^*_{it} + (1-\alpha)(LEV/A)_{it-1} \qquad (3.12)$$

we already know that the target debt level is given by equation *(3.10)*. Substituting in equation *(3.11)* we get the debt level as:

$$(LEV/A)_{it} = \alpha\lambda_0 + (1-\alpha)(LEV/A)_{it-1} + \alpha\lambda_1 (CashFlow/A)_{it} + \alpha\lambda_2 (Log\ Sales)_{it} + \alpha\lambda_3 (INV/A)_{it} + \alpha\lambda_4 (Q)_{it} + \alpha\lambda_5 (TAX)_{it} + \varepsilon_{it} \qquad (3.13)$$

which can be rewritten as:

$$(LEV/A)_{it} = \beta_0 + \beta_1 (LEV/A)_{it-1} + \beta_2 (Cash\ Flow/A)_{it} + \beta_3 (Log\ Sales)_{it} + \beta_4 (INV/A)_{it} + \beta_5 (Q)_{it} + \beta_6 (TAX)_{it} + \varepsilon_{it} \qquad (3.14)$$

This is the specification that we use in this chapter to investigate the relationship between leverage and firm-specific variables.

The baseline specification that we use to test our propositions is as follows:

$$(LEV/A)_{it} = \beta_0 + \beta_1 (LEV/A)_{it-1} + \beta_2 (Cash\ Flow/A)_{it} + \beta_3 (Log\ Sales)_{it} + \beta_4 (INV/A)_{it} + \beta_5 (Q)_{it} + \beta_6 (TAX)_{it} + v_i + v_t + \varepsilon_{it} \qquad (3.15)$$

where i indexes firms, i=1,2,3….N and t indexes years, t=1,2,3….T

Since we use panel data, we include both a firm specific and time specific error term. Hence, the error term now consists of three components: v_i is a firm-specific fixed effect that controls for unobserved time-invariant characteristics, v_t represents a time specific component and reflects aggregate effects common across companies to control for macroeconomic influences, including factors as nominal interest rates and

inflation, ε_{it} is an idiosyncratic error term. In the above model of debt adjustment, the target level of debt is not externally determined. In other words, unlike previous studies, we do not have to calculate the target debt level from historical data or some other dubious sources (Miguel and Pindado, 2001). Also, in case firms do not have a target debt level, as proposed by the POT, the model is still applicable.

3.6.3 **DETERMINANTS OF LEVERAGE**

In this section we discuss the various determinants of leverage in details and the expected signs on the coefficient of these variables.

Internal Finance *(Cash Flow/A)*$_{it}$

A factor that has been widely used in most studies on capital structure includes the internal finance of a firm, which is generally used as a measure of internal financial resources. According to Benito and Vlieghe (2000), a firm fails if the value of its assets falls below the value of its debt. Hence, profits are a key determinant of the change in asset value. A shock to the balance sheet can occur which could force a firm to adjust its liabilities quickly. In such a case liquidity is vital as the firm could use it in any sudden adjustment process. Benito and Vlieghe (2000) suggest that the most natural barometer of corporate financial health of a firm is its profitability.

There have been conflicting theoretical predictions and empirical evidence on the effects of profitability on leverage. Myers and Majluf (1984) predict a negative relationship while Jensen (1986) predicts a positive relationship. The Trade-off Theory, predicts a positive relationship between the debt ratio and the profitability of a firm. Firms normally have to pay taxes on their profits. To avoid this, they prefer to take more debt in their capital structure as interest payments on debt are generally tax deductible. Agency costs theories also predict that profitable firms would take more debt in their capital structure to restraint the activities of managers. Hence, the more profitable a firm is, the more debt it will have in its capital structure.

The POT on the other hand predicts a negative relationship between the profitability and the leverage of the firm. The reason behind this is that in the financial hierarchy proposed by the POT, firms would always prefer to use internal finance before debt. Internal funds are the cheaper source of funds and additionally firms do not suffer from the asymmetric information problem that they face when they try to access external funds.

We use both a profitability and liquidity measure to account for internal resources of firms. In our study, we mainly proxy for internal finance with the cash flow of the firm *(CashFlow/A)* calculated as the firm's after tax and interest cash flow scaled by assets. Rajan and Zingales (1995) in their study of firms in the G7 countries and Fama and French (2002) in their study of firms in the US, use a cash flow measure to account for the effect of liquidity on capital structure. Long and Malitz (1985), Titman and Wessels (1988), Rajan and Zingales (1995), Graham (2000), Graham and Harvey (2000) and Fama and French (2002) find a negative relationship between profitability and leverage indicating that firms that have more internal resources have less debt, which is in accordance to the POT. Other measures of liquidity of firms that we include in our regression specification are the cash stock *(Cashstock),* retained earnings *(Retained)* and Liquid *(Liquid)* which is the difference between current assets and current liabilities.

The other control variables that we use as suggested by prior literature are the investment undertaken by the firm, size of the firm, growth opportunities and taxes paid by the firm. These are discussed in turn below.

Size $(Log\ Sales)_{it}$

The impact of size on capital structure is not very clear. The TOT predicts a positive relationship between the size of a firm and the debt level. This positive relationship can be explained by the fact that larger firms tend to be more diversified and fail less often (Ang et al, 1982 and Petit and Singer, 1985). Also, banks (lenders) may be more willing to lend to large firms as they believe that the probability that these firms will go bankrupt is very low. Rajan and Zingales (1995), Frank and Goyal (2002) and Booth et al (2001), find a positive relationship between size and leverage, which is in line with the TOT.

However, it can also be that size is inversely related to leverage. The POT for instance stresses the importance of internal funds. The larger a firm is, the more profitable it could be and therefore the higher its retained earnings. Firms that have enough retained earnings, would prefer to use their retained earnings rather than debt. Therefore, according to the POT we would expect that the bigger the firm, the lower the debt ratio. Titman and Wessels (1988) and Benito (2003) find a negative relationship between size and the level of debt in a firm. Various studies have used a number of measures to capture the size of firms. Titman and Wessels (1988) and

Benito (2003) use the log of sales to measure size. Similarly we also find that the log of sales (*Log Sales)* seems to be an appropriate measure of size.

Investment $(INV/A)_{it}$

A higher investment level means that more funds are needed. Therefore, leverage is increasing in investment. The more a firm invests, the less it is likely to be able to finance its investment from internal funds. According to the POT when internal funds are not sufficient, debt rather than equity should meet the shortage in funds. However, the TOT predicts that firms that have higher investment also have less debt. This is largely due to agency considerations. Firms with higher investment do not need to take debt to constrain the activities of managers as cash flow is allocated towards investment opportunities. Benito (2003) finds that firms in the UK have a positive relationship between leverage and cash flow indicating that firms with higher investment undertake more debt.

Growth Opportunities $(Q)_{it}$

The relationship between growth opportunities and the debt ratio is also quite conflicting. The TOT predicts that firms with more growth opportunities will have less debt as there is less need for the disciplining role of debt. Firms that have growth opportunities would prefer to retain debt capacity as they might need to borrow in the future. Further, growth opportunities are capital assets that add value to a firm but cannot be collateralised and do not generate current taxable income (Titman and Wessels, 1988). For this reason, the arguments put forth suggest a negative relationship between debt and growth opportunities

However, Benito (2003) proposes the opposite. If firms have growth opportunities, then they require more funds to grow. Given that internal resources are not sufficient, firms would then turn to external sources of finance, which would lead to a higher debt level in firms. Indicators of growth include capital expenditures over total assets or growth of total assets measured as the percentage change in total assets. Firms generally engage in research and development to generate future investments. Research and development over sales also serve as an indicator of the growth attribute. We control for growth opportunities using Tobin's Q which is calculated as the value of the firm plus total loan capital minus total cash and cash equivalent divided by the replacement value of assets (see Benito, 2003).

Tax *$(TAX)_{it}$*

Taxes are believed to be important factors that affect the amount of debt that a firm has in its capital structure (Barclay and Smith, 1999). The more profitable a firm is, the more taxes it would have to pay. To avoid paying a lot out in taxes firms might prefer to take more debt because interest payments artificially reduce the profits of the firm and consequently they pay less tax on their profits. Therefore, by taking more debt in their capital structure firms benefit from the 'interest tax shield' that debt provides. This benefit of debt is mainly advocated by the TOT which predicts that the more taxes a firm has to pay the more debt it will have in its capital structure. The tax variable *(TAX)* is calculated as tax paid divided by profit before tax. See Table 3.A in the appendix for a survey of empirical studies and the signs obtained on the variables.

3.6.4 **ESTIMATION METHODOLOGY**

We estimate equation *(3.15)* using the first-difference Generalised Method of Moments (GMM) estimator, (Arellano and Bond, 1991) rather than the Ordinary Least Squares (OLS) or the Within Groups estimators. The Ordinary Least Squares (OLS) method ignores both firm-specific heterogeneity and potential endogeneity of regressors. The OLS estimator is likely to be inconsistent since the explanatory variables are positively correlated with the error term. Due to the presence of individual effects, the correlation does not vanish even as the size of the sample increases. Bond (2002) shows that standard results for the omitted variable bias indicate that (at least in large samples) the OLS estimator of the coefficient on the lagged dependent variable is biased upwards.

On the other hand, the Within Groups estimator takes account of firm-specific heterogeneity but ignores potential endogeneity of regressors. The Within Groups estimator eliminates the source of inconsistency by transforming the equation to eliminate the individual (time invariant) effects. However, even if the Within Groups estimator takes into account firm heterogeneity, it fails to take into account the potential endogeneity of the regressors. Bond (2002) shows that at least in large samples the coefficient on the lagged dependent variable using the Within Groups estimator is biased downwards. The OLS and Within Groups estimator are likely to be biased in opposite directions. This implies that if the coefficient obtained on the lagged dependent variable using the GMM estimator lies between the coefficient

obtained using the OLS estimator and the Within Groups estimator, then the GMM estimator is the correct one to use.

The most appropriate estimator for the above specification is the first-difference GMM estimator (Arellano and Bond, 1991) which takes into account both firm-specific heterogeneity and potential endogeneity of regressors. We estimate equation (3.15) using the first-difference Generalised Method of Moments (GMM) estimator, (Arellano and Bond, 1991) which takes into account both firm-specific heterogeneity and potential endogeneity of regressors. Our instrument set includes $(LEV/A)_{it}$, $(Cash\ Flow/A)_{it}$, $(Log\ Sales)_{it}$, $(INV/A)_{it}$, $(Q)_{it}$ and $(Tax)_{it}$ which are lagged 2 to 5 times.

We use the Sargan test and the m2 to evaluate if our model is correctly specified. The J statistic is the Sargan/Hansen test for overidentifying restrictions. Under the null of instrument validity, the J statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of instruments less the number of parameters. If the model used is correctly specified and the instruments are adequate, the variables in the instrument set should not be correlated with the idiosyncratic component of the error term ε_{it}. On the other hand, the m2 test, which tests for second-order serial correlation, is asymptotically distributed as standard normal under the null of second-order serial correlation. This test provides a further check on the specification of the model and on the validity of variables dated t-2 as instruments. If the p-values for the Sargan test and the m2 test are both greater than 0.05, then the instruments are acceptable.

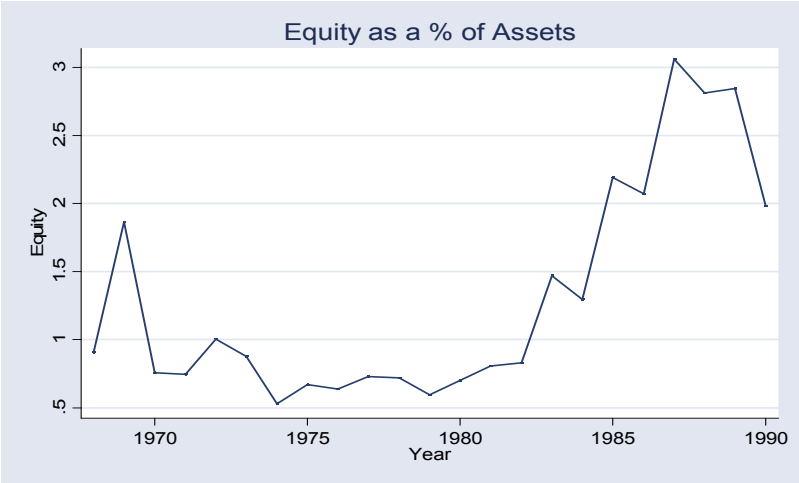
3.7 DESCRIPTIVE STATISTICS

Table 3.1 presents the descriptive statistics of the quoted firms in the UK. Figure 3.2 below shows the behaviour of leverage of quoted manufacturing firms in the UK over the 1968-2000 period. The graph shows that there was a rise in corporate indebtedness in the late 1980s (due to the economic boom) which was reduced in the recession of the early 1990s.

Figure 3.1: Leverage Behaviour of UK Firms

We next consider equity issues. As stated by Benito (2003) new equity issues are very minimal among quoted firms in the UK. We find evidence of the same when we consider Figure 3.2 below, where new equity issues represent only around 3% of assets for the manufacturing firms[27].

Figure 3.2: Use of Equity by UK Firms



As mentioned earlier, in this study we focus mainly on leverage and internal financing. The financing pattern of the sample of quoted Manufacturing firms in the UK is captured by the *(LEV/A)* variable. *(LEV/A)* is the book leverage (short-term debt plus long-term debt) of the firm scaled by assets. The other measures of leverage are short-term debt over assets *(STD/A),* long-term leverage over assets *(LTD/A)* and net leverage (total debt minus cash) over assets *(Net Leverage/A). (Cash Flow/A)* is

[27] Unfortunately we only have data on equity issues till 1991.

the firm's after tax and interest cash flow scaled by assets which proxies for internal finance or cash flow innovations as stated by Almeida and Campello (2005).

Other measures of liquidity of firms that we use include the cash stock *(Cashstock),* retained earnings *(Retained)* and Liquid *(Liquid)* which is the difference between current assets and current liabilities, all scaled by assets. *(Log Sales)* is the log of sales that controls for size effects. *(INV/A)* is the investment undertaken by the firm scaled by assets. We rely on Tobin's Q *(Q)* to control for growth opportunities. Finally *(Tax)* controls for the effect of taxes on capital structure.

Figure 3.3: Leverage of Small and Large Firms

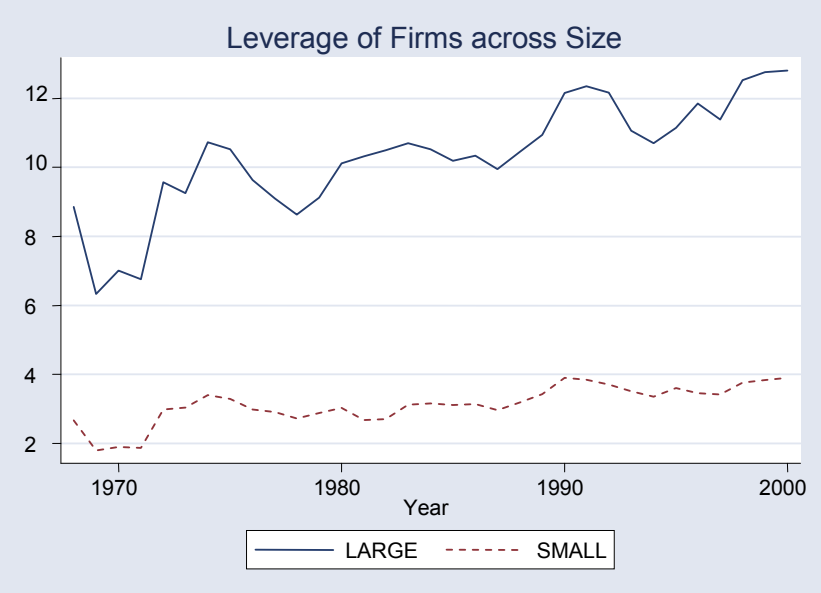


Table 3.1 also gives the summary statistics of firms according to various measures of financial constraints. Firms that have low real assets (financially constrained firms) have low leverage, are smaller in size and have less growth opportunities (column 2), while firms that have high real assets (financially unconstrained) have high leverage, are larger in size and have more growth opportunities (column 3). However, they have similar cash flows and there is not much difference in their level of investment. Figure 3.3 above shows the behaviour of leverage across firms of different sizes. As expected larger firms are much more leveraged than smaller firms.

Next in columns (4) and (5), we classify firms as being financially constrained and unconstrained according to their coverage ratios. Firms that have low coverage ratio (coverage ratio less than 5) are more leveraged while firms that have high coverage ratios are less leveraged and have much higher cash flow than firms with low coverage ratio. In columns (6) and (7) of Table 3.1, we classify firms according

to their indebtedness level. Firms that are highly leveraged as shown in column (6) have low cash flow while firms that have low leverage have quite high cash flow (column 7).

3.8 **REGRESSION RESULTS**

Table 3.2 presents the regression results for the full sample of firms using the Arellano and Bond (1991) Generalised Method of Moments (GMM) estimator. We use the first-difference GMM estimator as it takes into account both firm specific heterogeneity and potential endogeneity of our regressors. Overall, the results obtained suggest that profitability negatively influences the leverage of listed manufacturing firms in the UK as indicated by the negative coefficient of -0.527 on the internal finance variable measured by cash flow. This is in accordance with the POT, implying that firms always prefer to use internal finance first. Hence when firms are faced with positive cash flow innovations, they tend to reduce their use of leverage.

The positive coefficient on the lagged dependent variable is 0.429, which suggests that the speed of adjustment to a target leverage is 0.571, which indicates that firms take around two years to move back to their target leverage[28]. The coefficient is positive and less than one suggesting that there are significant adjustment costs involved for firms to move to their target debt ratios. Therefore, firms try to move to their target level of leverage over time rather than adjusting immediately to their target. The coefficient of 0.018 on the *Log Sales* variable suggests that there is a positive relationship between size and leverage that is in accordance with the TOT. This suggests that larger firms have easier access to external financing as lenders are possibly more willing to lend to them. The positive coefficients on the investment and Tobin's Q variables (0.168 and 0.006 respectively) are according to the POT suggesting that firms that invest more and that have more growth opportunities are more highly levered as they require more funds. The positive coefficient of 0.019 on the tax variable suggests that the more taxes firms have to pay the more highly levered they are. This suggests that firms do indeed use the tax shield that debt provides[29].

[28] The coefficient of 0.571 is obtained as 1 less 0.429.
[29] When a firm takes debt, it has to pay interest on it. This interest payment is usually tax deductible as it artificially reduces the profit of the firm. The firm thus pays less in taxes.

We test for the robustness of our results in columns *(2), (3), (4), (5), (6)* and *(7)* Table 3.2. In column *(2)* of Table 3.2 we use a net leverage measure as our dependent variable. This net leverage measure is calculated as the sum of short-term debt plus long-term debt minus cash stock. In column *(3)*, we use short-term debt (*STD*) as our dependent variable which consists of debt with a maturity of less than one year. In column *(4)* we use a long-term debt measure (*LTD*) that only takes into account leverage with a maturity of more than one year. The results obtained indicate that there is a negative relationship between these various forms of leverage and cash flow indicating that when firms experience an increase in cash flow, they tend to reduce their leverage. The signs on other coefficients are as expected. We find that there is a negative relationship between leverage and cash flow and find that this result holds when we consider alternative measures of leverage.

To further test whether this negative relationship is robust, we use alternative measures of internal finance. Therefore, in column *(5)* of Table 3.2, we use a cash stock measure *(Cashstock/A*) which is calculated as the sum of cash, bank balances, short-term loans and deposits and short-term investments. In column *(6)* we use retained earnings of firms (*Retained/A)* as our measure of internal finance. In column *(7)* we use a liquid assets measure *(Liquid/A*) calculated as current assets minus current liabilities and represent those assets such as debtors and stock that can be readily converted into cash. The results obtained again indicate that firms tend to reduce their leverage when they experience an increase in their internal finance.

3.8.1 REGRESSION RESULTS:
ACCOUNTING FOR FINANCIAL CONSTRAINTS

In this section, we discuss the regression results obtained when we examine the relationship between debt and cash flow innovations, taking into account financial constraints faced by firms. The specification that we use to test our propositions is as follows:

$$(LEV/A)_{it} = \beta_0 + \beta_{11}(LEV/A)_{it-1} * CONSTRAINED_{it} + \beta_{12}(LEV/A)_{it-1} * CONSTRAINED_{it} + \beta_{21}(Cash\ Flow/A)_{it} * CONSTRAINED_{it} + \beta_{22}(Cash\ Flow/A)_{it} * UNCONSTRAINED_{it} + \beta_3(Log\ Sales)_{it} + \beta_4(INV/A)_{it} + \beta_5(Q)_{it} + \beta_6(TAX)_{it} + v_i + v_t + \varepsilon_{it} \qquad (3.16)$$

where i indexes firms, $i=1,2,3....N$ and t indexes years, $t=1,2,3....T$

The instruments used therefore are $(LEV/A)_{it}$*$CONS_{it}$, $(LEV/A)_{it}$*$UNCONS_{it}$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$,$(Tax)_{it}$,$(CASHFLOW/A)_{it}$*$CONS$ and $(CASHFLOW/A)_{it}$*$UNCONS$ all lagged two to five times.

In column *(1)* of Table 3.3, we interact the cash flow term with two dummies: *CONSTRAINED* is a dummy that equals to one if the firm is financially constrained and 0 otherwise. *UNCONSTRAINED* is a dummy that equals to one if the firm is financially unconstrained and 0 otherwise. We hypothesize that when faced with positive cash flow innovations, firms that are financially unconstrained are able to reduce their leverage by a more significant amount than firms that are financially constrained. As described earlier, we first measure financial constraints according to the distribution of the real assets of firms.

The coefficients show that firms that are financially unconstrained reduce debt by a larger amount (-0.584) when faced with cash flow innovations than firms that are financially constrained (-0.476). Testing for the equality of coefficients obtained, the F-statistics on the coefficients of cash flow variable interacted with the *CONS* and *UNCONS* firm-year dummies is *(F(2, 612)= 36.57)* which indicates that the coefficients obtained are statistically different from each other. These results are similar to those obtained by Almeida and Campello (2005) who find that financially constrained firms in the US are not able to reduce their leverage as much as their unconstrained counterparts.

The coefficient on the lagged dependent variable for constrained firm-years is 0.390 while for constrained firms it is 0.440. This indicates that adjustment level to a target leverage is 0.691 for constrained firm-years while it is 0.560 for unconstrained firm-years[30]. The magnitude of the coefficients indicates that constrained firm-years adjust to a target leverage much faster than unconstrained firm-years. One reason for this could be that it is costly for constrained firms to be away from their target leverage. The F-statistics obtained on the coefficients of the lagged dependent variables in column 1, *(F(2, 612)= 78.60)* indicate that the coefficients obtained for the *CONS* and *UNCONS* firm-years are statistically different from each other.

In column *(2)*, we replace the cash flow measure with a profitability measure to check the robustness of our results. Again, the results indicate that the sensitivity of leverage to variations in internal funds is less negative for constrained firms (-0.375)

[30] These coefficients are obtained as 1 minus the coefficient on the lagged dependent variable.

than for unconstrained firms (-0.527). This suggests that as profits rise, unconstrained firms reduce debt by a more significant amount than constrained firms. The F-statistics *(F(2, 612)= 25.97)* indicates that the coefficients obtained for the constrained and unconstrained firms are statistically different from each other.

The results obtained are also robust when we distinguish between constrained and unconstrained firms using the coverage ratio. Unconstrained firms (firms with a coverage ratio of more than five) are able to reduce their leverage by higher amount (-0.523) than firms that are financially constrained (firms with a coverage ratio less than five with a coefficient of -0.331). Similar results hold for firms that are classified as constrained or unconstrained according to their level of indebtedness as shown in column 4 of Table 3.3.

Regarding the diagnostics test in all cases, we find that m2 (the test for second order serial correlation) indicates that we do not have the problem of second order serial correlation of the residuals. The p-value associated with the Sargan test indicates that the instruments we are using are correct and that our model is correctly specified in all cases. We perform additional robustness checks using different cut-off levels at the 30th percentile rather than the 25th percentile for the distribution of real assets and indebtedness levels and the results we obtain are again robust[31]. These results are shown in Table 3.4[32].

What do these results suggest? These results suggest that firms are dependent on cash flow. When faced with cash flow innovations, both constrained and unconstrained firms try to reduce their leverage. Another possible interpretation for this behaviour is as follows: when unconstrained firms experience a cash flow innovation, they can afford to use up the cash flow in debt repayments. Because these firms are financially unconstrained, they can afford to take debt if other investment opportunities arise.

However, when constrained firms experience a cash flow innovation they are not able to reduce their leverage as much as the unconstrained firms. The explanations could be as follows: first, constrained firms who have difficulty getting access to external funds, optimally need to allocate the extra cash towards profitable investment opportunities. Second, because they know they cannot get external

[31] The results above also confirm the predictions of Almeida and Campello (2005).
[32] We do additional robustness tests. We use employment levels and tangible assets to distinguish between constrained and unconstrained firms. The results obtained, although not reported are once again robust.

finance easily, these constrained firms save part of the cash flow to undertake investment opportunities that might arise later. It should be noted that the magnitude of the coefficients are not very different for constrained and unconstrained firms. This could possibly be explained by the fact that listed firms in the UK do not vary much in firm-characteristics and thus constrained firms are not very "constrained"[33].

3.9 **CONCLUSION**

Previous studies on capital structure have mainly examined the determinants of debt or focused on the debt-equity mix choice of firms. At the same time, studies that have taken into account financial constraints faced by firms have mainly examined investment-cash flow sensitivities. In this paper, we merge these two different strands of literature and try to examine how financial constraints affect the leverage of firms. In particular, as the main innovative aspect, we examine how financial constraints affect the relationship between leverage and cash flow.

First, we establish the fact that firms indeed follow a financial hierarchy as proposed by the pecking order when they decide what sources of finance they use. We find that there is a negative relationship between leverage and cash flow indicating that when a firm experiences cash flow innovations, it tends to reduce the amount of leverage in its capital structure. This result suggests that firms always prefer to use internal finance when it is available and also points towards a debt conservatism approach of firms that has clearly been observed in the last two decades. Other factors that affect leverage in our study are the size of firms, their investment and their growth opportunities.

Next, we use a number of criteria proposed in the literature to distinguish between financially constrained and unconstrained firms. These criteria include the distribution of real assets of firms, coverage ratios and the level of indebtedness of firms. Similar to the results obtained by Almeida and Campello (2005) who study firms in the US, we find that for firms in the UK, when real uses of funds are correlated with variations in internal funds for firms that are financially constrained, the sensitivity of debt to variations in internal funds is less negative for constrained firms than for unconstrained firms. In other words, our findings suggest that when unconstrained firms experience an increase in internal finance, they are able to reduce

[33] Listed firms in the UK possibly are less financially constrained and suffer less from information asymmetry.

their leverage by a larger amount than unconstrained firms. Our results also suggest that constrained firms revert back to their target leverage faster than their unconstrained counterparts, possibly because it is costly for them to be away from their target leverage.

Overall, the results we obtain suggest that firms in the UK are quite financially conservative. The other news (not surprising) is that firms in the UK behave in a quite similar manner as their US counterparts. We find that even listed firms who have the broadest menu of financing choices actually chose from a few sources of finance and among them internally generated funds and debt are the most important sources.

It should be noted that in this study we have mainly distinguished between financial constraints by considering overall financial constraints, that is, by taking into account factors like real assets, coverage ratios and indebtedness levels. These are mainly factors that outsiders would look at to determine whether a firm appears to be financially constrained or unconstrained and whether they would like to lend to that firm or not.

The other set of financial constraints that have been sidelined in this study are internal financial constraints. If the pecking order is true then the main factor that would influence whether a firm would go for external finance or not, are internal financial constraints. For instance, if a firm has sufficient funds then it will choose not to have recourse to external finance and will use its internal funds. In this case, overall financial constraints are irrelevant for the firm. On the other hand, if a firm is internally financially constrained and needs external funding, then obviously overall financial constraints are very important. This issue is considered in the next chapter where we examine the financing of small and medium size enterprises in the UK, as these firms are more likely to suffer from financial constraints than the firms studied in this chapter.

PART II

DO FINANCIAL CONSTRAINTS AFFECT THE RELATIONSHIP BETWEEN FIRM LEVERAGE AND CASH FLOW? EVIDENCE FROM SMEs IN THE UK

3.10 INTRODUCTION

Most studies on capital structure have examined the relationship between debt and equity. However, a number of firms do not have access to equity markets and a majority do not issue shares at all. In this case, the two most important sources of financing of firms are internal funds (for instance cash flow) and debt (as the major form of external finance). Firms like to be financially flexible (Graham and Harvey, 2001) and one way for firms to be financially flexible is to use internal finance whenever they are able to do so. Consequently, one of the important factors that determine leverage, that is debt levels in firms, is the level of their internally generated funds.

The main innovation in this chapter is that we study the relationship between debt and cash flow, the two main sources of finance for most firms by taking into account the internal and overall financial constraints that firms face. As far as we know, this has not been studied in the literature before. By internal financial constraints we are mainly referring to the level of internally generated funds which would determine whether or not a firm decides to go for external financing. We proxy for the level of internally generated funds by mainly taking into account the cash flows and profitability of firms. Overall financial constraints refer to the ease with which firms get access to external financing. A firm might be internally financially constrained by the level of its cash flows but not financially constrained overall if it can access external financing. To proxy for overall constraints, we use conventionally used measures of financial constraints in the literature and take into account the distribution of real assets of firms and a measure of risk.

We study unquoted firms in the UK, while the majority of studies in this field have mainly examined quoted firms, due to easy data availability. Unquoted firms are mainly Small and Medium-sized firms (SMEs) which do not have access to stock

markets and rely mainly on debt as their primary source of external finance. It is interesting to study the financial policies of these firms regarding their debt policy decisions as these firms are likely to be debt-dependent.

One of the few studies that have examined SMEs' access to finance in the UK include Bougheas, Mizen and Yalcin (2006) who specifically examine firm's access to bank and market finance. They develop a model that determines how firms' characteristics such as size, risk and debt determines their access to bank or market finance. Bougheas et al (2006) also examine how firms' characteristics influence their access to credit when there is a change in the interest rates. Using data on 16,000 manufacturing firms in the UK over the 1989-2000 period, Bougheas et al (2006) find that smaller, more risky and younger firms are noticeably affected by monetary tightening than larger, secure or older firms.

Debt levels might affect the growth and survival of firms as there are quite a number of problems associated with debt, for example repayment of interest and capital, costs of financial distress or more importantly, costs of bankruptcy. It is therefore important to study how internally generated funds affect debt levels in firms. Additionally, most capital structure theories have been developed to explain the capital structure of large firms and the question whether these theories apply to SMEs is still a puzzle.

Our results suggest that firms follow a financial hierarchy when deciding what sources of finance to use. Internal financial constraints are important factors that influence the amount of debt that a firm has in its capital structure. The results obtained also seem to suggest that however large a firm might be and however easy it is for a firm to have access to debt, firms inherently do not like to increase debt in their capital structure. This implies a major reliance of firms, especially unquoted ones, on cash flow. Hence these firms might be constricting their performance according to their cash flows. This has important implications on growth as it suggests that if these firms had been less debt averse perhaps they could have achieved higher growth.

Part II is organised as follows: we present some background information on the financing decisions of firms in section 3.11. In section 3.12, we discuss the theoretical implications of our study. In section 3.13, we describe our dataset and present other relevant information. In Section 3.14 we elaborate our empirical specification and in section 3.15 we introduce financial constraints in our empirical

specification and discuss our classification scheme. Following this in section 3.16, we present summary statistics for the full sample and according to the various classification schemes we use. In section 3.17, we discuss our empirical results. Section 3.18 concludes.

3.11 **BACKGROUND**

Very few studies have studied the capital structure decisions of firms in the UK and even fewer studies have examined the capital structure decisions of small and medium-sized firms. Some exceptions are Bennet and Donelly (1993), Marsh (1982), Benito (2003) and Panno (2003) who study the behaviour of quoted firms in the UK while Hughes (1997) and Michaelas et al (1999) study the capital structure decisions of small and medium-sized firms in the UK.

In Part II of this chapter we study unquoted firms. Unquoted firms are obviously likely to suffer from the problem of information asymmetry as unlike quoted firms, information on these firms are not made available to market participants as compared to quoted firms. Unquoted firms are more likely to face difficulties to obtain external finance as they may have short track record, poor solvency and low real assets (Guariglia, 2006). Because of this we believe that cash flow might be of particular importance to these firms and therefore it will have a major impact on the leverage decisions of these firms.

We also investigate the relationship between debt and cash flow by taking into account the degree of internal and overall financial constraints that a firm might face. Most of the financial constraint literature has only studied how financial constraints affect firms' investment decisions. Financial constraints could possibly affect capital structure decisions, that is, the amount of debt that a firm holds. For instance, the degree of financial constraints that a firm faces might well affect the amount of internal finance that a firm uses or more importantly the amount of debt that a firm has in its capital structure.

Unlike the previous chapter, we focus on both internal and overall financial constraints. The reason for doing this is that SMEs are likely to suffer more from financial constraints and distinguishing between internal and overall constraints enables us to understand which constraints are more important. Internal constraints refer to those constraints that determine whether or not a firm would go for external financing. Hence in this case, the level of internally generated funds (mainly cash

flow) would determine the amount of debt that a firm has in its capital structure. The other factor that would determine the amount of debt in the capital structure of firms is the overall financial constraints that firms might face, which refer to how easy or how difficult it is for firms to have access to external financing.

We account for firms having different levels of cash flow and profitability to take account of internal financial constraints while we take into account the real assets and a measure of risk to account for overall financial constraints and try to show how these affect the relationship between debt and cash flow at unquoted firms in the UK.

3.12 THEORETICAL IMPLICATIONS

The POT predicts a negative relationship between debt and cash flow, for instance, if firms experience an increase in cash flow, they are likely to reduce debt in their capitals structure. It is likely that the POT would better explain the financing behaviour of unquoted firms as factors like tax advantages would not really be relevant for these firms who are much more likely to be cash constrained and debt dependent. If these firms experience an increase in their cash flows they are more likely to reduce debt from their capital structure rather than try to shield income from taxation as proposed by the TOT.

The upper portion of the pecking order (new equity financing) is obviously irrelevant for unquoted firms as they cannot issue public equity. Hence the two important sources of financing are internal finance and debt. It is likely that a negative relationship would exist between debt and cash flow for unquoted firms. Firms that have positive cash flows would obviously try to reduce the debt levels in their capital structure as smaller firms are more likely to be debt averse. Therefore the predictions of the POT would hold for these firms.

However, this negative relationship is unlikely to hold throughout. Many firms operate with negative levels of cash flow and they might make losses in a number of years. Firms that have negative cash flows are likely to be more debt dependent and would therefore have more debt in their capital structure. In this case there is likely to be a positive relationship between the debt level and the negative cash flows in these firms.

On the other hand, it might also be the case that these firms have negative cash flows but still prefer to have low debt levels. This reasoning can be explained by

the fact that undertaking debt implies that interest has to be paid on it. Obviously firms that have negative cash flows would not be able to undertake debt servicing and might therefore prefer to have less debt in their capital structure.

It is true that in many cases internal financial constraints are not binding. Firms can get access to external financing if they are large enough or can supply the required collateral. This can be taken into account by considering the overall financial constraints that firms face. If firms still reduce the amount of debt in their capital structure despite being large enough this will further point towards the debt averse behaviour of firms and give more support to the POT. We use different classification schemes (discussed in section 3.16) to distinguish between different levels of internal and overall financial constraints that firms might face.

3.13 DESCRIPTION OF DATA

Most studies on capital structure of firms have considered all firms in the whole economy excluding the financial intermediation sector. The reason for this is that the capital structure of firms in the financial intermediation sector is heavily influenced by regulatory requirements[34]. Instead of analysing firms in the whole economy as has been done in a number of studies, we follow Fazzari et al (1988) and study firms only belonging to the Manufacturing sector[35]. This sector is a vital part of the economy and is still crucial for the country's prosperity now and in the future. It is more likely that firms that belong to one sector are more similar than firms belonging to different sectors.

The dataset used is a sample extracted from the *Financial Analysis Made Easy* (FAME) database. The FAME database is collected by Jordans Bureau Van Dijk for commercial use and is constructed from the profit and loss and balance sheet data. The database consists primarily of unquoted companies.[36] It contains information on

[34] For instance, Rajan and Zingales (1995) and Fama and French (2002) eliminate all financial firms such as banks and insurance companies from their sample because the leverage of these firms is strongly influenced by explicit investor insurance schemes such as deposit insurance and minimum capital requirements.

[35] According to the DTI (2004) Manufacturing represents a sixth of the UK economy and it is responsible for the majority of UK exports. It is also one of the biggest employment providers and responsible for the bulk of research and development in the UK.

[36] It also contains information on some companies that are quoted on alternative exchanges such as the Alternative Investment Market (AIM) and the Off-Exchange Market (OFEX) however the majority of companies do not have access to any stock markets. To keep our study focussed on unquoted firms, we drop some types of firms from the dataset. These include "Unlimited", "Public AIM", "Guarantee" and "Public, Not Quoted."

companies in detailed format over the 1994-2003 period. Our sample covers the same period and we have data on 13,556 unquoted manufacturing firms that adds up to 81,556 firm-year observations. Our sample has an unbalanced structure and the number of years of observation varies between 3 and 10.

We remove all outliers in the dataset by excluding observations that lie in the 1% tails of each regression variable (discussed in the next section) and also drop all firms that appear less than 3 times in the survey. We allow firms to transit between classes and therefore our focus is on firm-years rather than simply years. We allow both entry and exit as the use of an unbalanced structure reduces to an extent potential survivor bias. Survivorship is of particular importance in our study especially as finance plays a very important role in firm survival.

3.14 EMPIRICAL SPECIFICATION

Similar to Part I of this Chapter we use the following specification:

$$(LEV/A)_{it} = \beta_0 + \beta_1(LEV/A)_{it-1} + \beta_2(Cash\ Flow/A)_{it} + \beta_3(Log\ Sales)_{it} + \beta_4(Sales\ Growth)_{it} + \beta_5(Structure)_{it} + \beta_6(Tax)_{it} + v_i + v_t + \varepsilon_{it} \quad (3.17)$$

As in the earlier part of the chapter, we consider a comprehensive leverage measure, total debt, which considers both long-term debt and short-term debt[37]. The total debt measure (*LEV/A*) is calculated as total borrowing repayable in less than 1 year plus total loan capital repayable in one year or more divided by total assets. All debt measures in our study include loans, overdrafts, leasing and hire purchase.

Additionally, we mainly proxy for internal finance with the cash flow of the firm *(Cash Flow/A)* calculated as the firm's after tax and interest cash flow scaled by assets. We use the log of sales (*Log sales*) to control for size. We rely on a sales growth measure (*Sales Growth)* to control for growth opportunities as unlike quoted firms we cannot calculate Tobin's Q for unquoted firms.

Since we use panel data, we include both a firm specific and time specific error term. Hence, the error term now consists of three components: v_i is a firm-

[37] The reason why we limit our study to an overall debt measure is because we are interested in the relationship between debt and cash flow. Considering the components of debt separately eg short-term debt and long-term debt would make the analysis more complicated as there are reasons to believe that the factors that affect the amount of long-term debt in a firm might not affect the short-term debt and vice versa (Titman and Wessels,1988).

specific fixed effect that controls for unobserved time-invariant characteristics, ν_t represents a time specific component and reflects aggregate effects common across companies to control for macroeconomic influences, including factors as nominal interest rates and inflation, ε_{it} is an idiosyncratic error term.

3.15 EFFECTS OF FINANCIAL CONSTRAINTS ON THE RELATIONSHIP BETWEEN LEVERAGE AND CASH FLOW FOR SMEs

We believe that financial constraints are important factors that influence capital structure decisions of firms. There are two main factors that we believe would affect whether or not a firm goes for external financing (in this case debt). First it depends on whether the firm really needs external financing and this would be determined by the amount of internal funds. In this case internal constraints would influence the amount of debt that a firm ultimately needs. For instance an internally financially constrained firm is likely to have more debt in its capital structure than a firm that is not internally financially constrained. As far as we know, there have been no studies that have implicitly accounted for the effect of financial constraints on capital structure decisions.

The second factor that would affect the external financing is whether or not the firm can have access to external financing (whether or not lenders are willing to lend to this firm.) This issue can be addressed by taking into account overall financial constraints, that is, how easy it is for a firm to get external finance. Factors like firm size and the amount of collateral that a firm can provide would provide a good measure of overall constraints.

In this section, we study how the presence of both internal and overall financial constraints affects the sensitivity of leverage to cash flow. It is not possible to explicitly include a variable in our empirical specification to account for the presence of internal and overall financial constraints on firm behaviour. We therefore have to rely on the use of proxies as discussed below and we make extensive use of various classification schemes to capture these two types of constraints.

3.15.1 CLASSIFICATION SCHEME

We use a number of different criteria to differentiate among various classes of firms. We first divide our firms according to measures of cash flow to capture internal

financial constraints. As a robustness check we use a profitability measure. We then divide our firms in size classes by using the real assets of firms. As robustness checks, we use a riskiness measure.

Our first sample separation criterion, motivated from Guariglia (2006) and to a certain extent from Povel and Raith (2002) is the distribution of real cash flow of the firms which we use as a measure of internal financial constraint. We first divide firms-years into two classes, those that have positive cash flows and those that have negative cash flows[38]. We then move on to further sub-divide firm-years that have positive cash flows into 2 separate classes so that we end up with three distinct classes of firms.

We therefore classify those firms that have negative cash flows in any firm-years as *INTERNALLY VERY FINANCIALLY CONSTRAINED* ($IVFC_{it}$)[39]. Next we classify firm-years that have positive cash flows. Firms that have their positive real cash flows in the bottom 25th percentile of the distribution of the positive real cash flows of all firm-years are classified as *POSSIBLY NOT INTERNALLY FINANCIALLY CONSTRAINED* ($PNIFC_{it}$). All firms having their real cash flow above the 25th percentile of the distribution of the positive real cash flows of all firm-years are classified as *NOT INTERNALLY FINANCIALLY CONSTRAINED* ($NIFC_{it}$). As a robustness check we use the profitability of firms and classify them according to the similar criteria as discussed above.

To distinguish between internal financial constraints from overall financial constraints, the sample separation criterion that we use based on the size of the firm, is the distribution of real assets of the firms. We use this measure to mainly take into account overall financial constraints which capture the ease or the difficulty with which firms might have access to debt. This is in line with conventionally used measures of financial constraints as used in the literature. Firms that have a high level of real assets or tangible assets would be larger and have more collateral and we would expect these firms to have fewer difficulties in obtaining external finance as lenders would be more willing to lend to these firms. It should be noted that these financial constraints measures also capture internal constraints as a firm will only turn towards external financing if alternative cheaper internal financing is not available.

[38] By focussing on firm-years we allow firms to transit between classes, therefore a firm can have negative cash flow in one year and positive cash flow in another year and so on…
[39] Note that all the firms are classified by industry and year.

Hence our financial constraint measures account for both internal and external constraints and can be assumed to be an overall measure of financial constraints. As above, we consider three different categories of firms.

Those firms that have their real assets in the lowest 25th percentile of the distribution of the real assets of all firm-years are classified as *FINANCIALLY CONSTRAINED*$_{it}$ (*FC*$_{it}$), as these firms would have insufficient internal finance and additionally face difficulties to get access to external finance. Firms that have their real assets between the 25th and the 75th percentile of the distribution of the real assets of all firm-years are classified as *LESS LIKELY TO BE FINANCIALLY CONSTRAINED* $_{it}$ (*LLFC*$_{it}$) as it is unlikely that these firms would have any difficulties to get access to external financing. All firms having their real assets in the top 25th percentile of the distribution of the real assets of all firm-years are classified as *NOT FINANCIALLY CONSTRAINED* $_{it}$ (*NFC*$_{it}$) as lenders would be more willing to lend to these firms.

To capture financial constraints (both internal and external), we use another measure of sample separation criterion which is the Quiscore[40], a measure of the riskiness of firms. The Quiscore is a measure of the likelihood of company failure in the twelve months following the date of calculation and we again use this measure to account for overall financial constraints. The Quiscore is based on statistical analysis of a random selection of companies[41]. To ensure that the model is not distorted, three categories are screened out from the initial selection: major public companies, companies that have sort insignificant amounts of unsecured trade credit and liquidated companies that have a surplus of assets over liabilities. The QuiScore is given as a number in the range 0 to 100.

Companies that have Quiscore value between 40 and 0 are unstable and high risk companies and we classify these companies as *RISKY*$_{it}$. It is more likely that risky companies are smaller. Companies that have Quiscore between 80 and 41 tend to be stable and normal companies and we classify these companies as *SAFE*$_{it}$. Companies that have Quiscore in the range 81-100 are believed to be secure companies and we classify these companies as *SECURE*$_{it}$.

[40] See Data Appendix for further details on how this measure is calculated.
[41] The QuiScore is intended to be an aid to the financial part of the overall assessment, and has to be considered in conjunction with other information such as seasonal trends, product life cycles, competition, interest rates and other micro and macro-economic factors. The stability of many companies is reliant of that of holding companies or other associates on which separate enquiries should be made.

3.16 DESCRIPTIVE STATISTICS

Table 3.5 presents the descriptive statistics of the unquoted firms. The financing pattern of the sample of unquoted manufacturing firms in the UK is captured by the *(LEV/A), (STD/A),* and *(LTD/A)* variables. *(LEV/A)* is the book leverage (short-term debt plus long-term debt) of the firm scaled by assets, *(STD/A)* is short-term debt while (*LTD/A)* is long-term debt, both scaled by assets. *(CF/A)* is the firm's after tax and interest cash flow scaled by assets, *(Log Sales)* is the log of sales that controls for size effects. We rely on a sales growth measure *(Sales Growth)* to control for growth opportunities. *(Structure)* is an asset structure variable that controls for the level of collateral and finally *(Tax)* controls for the effect of taxes on capital structure.

As expected, unquoted firms have quite high overall leverage at 33% with long-term debt representing 15% of assets and short-term debt at 20.8% of assets. The reliance of unquoted firms on debt can be explained by the fact that unlike their quoted counterparts, these firms cannot issue shares on the stock market. They are therefore constrained in their financing choices. Cash flow is also quite high at 10% of assets.

In Table 3.6 we present the descriptive statistics of the firms according to their degree of internal financial constraints as measured by the different levels of cash flow. Firms with negative levels of cash flow have much higher overall debt (45%), compared to that of firms with positive cash flows. These summary statistics suggest an inverse relationship between debt and cash flow; however, this has to be further investigated. They also point out that unquoted firms are much more debt dependent. The summary statistics also suggest that firms do not face any problems in getting access to debt finance. Firms that have negative cash flow have high debt. However is this relationship as straightforward as it seems? We analyse this issue in the next section.

In Table 3.7, we consider overall financial constraints, measured by the level of real assets. As can be observed, there is not a very pronounced difference in cash flows in unquoted firms of different sizes. However, larger unquoted firms have higher long-term debt at 19% of assets, indicating perhaps that these firms can afford to have higher debt because they are larger in size and can secure debt more easily.

We estimate equation (*3.17*) using the first-difference Generalised Method of Moments (GMM) estimator, (Arellano and Bond, 1991) which takes into account both

firm-specific heterogeneity and potential endogeneity of regressors. Our instrument set includes $(LEV/A)_{it}$, $(CF/A)_{it}$, $(Log\ sales)_{it}$, $(Sales\ Growth)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ which are lagged 2 to 5 times.

3.17 REGRESSION RESULTS

The results obtained for the unquoted firms using the GMM estimator as shown in Table 3.8, give more support to the POT. The empirical evidence points towards a negative relationship between debt and cash flow. Firms that have more internal funds (cash flow) have less debt in their capital structure (indicated by the negative and highly significant coefficient on the cash flow variable of -0.259) which is consistent with the POT. A one standard deviation change in cash flow is likely to bring about a 3% change in the debt level.

Larger firms have less debt indicated by the negative and significant coefficient of -0.106 on the sales variable suggesting that larger firms are less debt-dependent. This is again in accordance to the POT. The coefficient on the growth variable is not significant indicating that retaining debt capacity is not really a priority for unquoted firms. This might also suggest that these firms are myopic and they cannot perfectly foresee growth opportunities. The tax variable is also insignificant suggesting that tax considerations are not very important for firms in the UK as most of them normally benefit from low tax rates. The coefficient on the structure variable is insignificant suggesting that the amount of collateral that a firm can provide has no influence on its debt level. Although this seems strange, it can be explained by the fact that manufacturing firms have assets that are "specialised" and cannot really serve as collateral (see Schaller, 1993 and Guariglia, 2006).

Regarding the results of our first difference GMM estimations, we find that m2 (the test for second order serial correlation is 0.237) indicates that we do not have the problem of second order serial correlation of the residuals. The p-value associated with the Sargan test is 0.934, indicating that the instruments we are using are correct and that our model is correctly specified.

As a robustness check, we use another proxy for the level of internally generated funds by considering the profitability of firms. The results (shown in column 2 of Table 3.8) are robust to the ones obtained previously and point towards a negative relationship between the debt level and profitability.

3.17.1 ACCOUNTING FOR INTERNAL FINANCIAL CONSTRAINTS

We now investigate how different levels of cash flow at firms affect the relationship between firm leverage and cash flow. We use the *IVFC, PNIFC* and *NIFC* dummies in our leverage regressions as interactions on the cash flow term, the aim being to investigate how having different levels of cash flow influences the relationship between debt and cash flow. In this way, we also allow firms to transit between classes. The use of interaction terms on the cash flow variable also allows us to avoid running separate regressions on sub-sample of firms with different levels of cash flow. Additionally, we avoid problems of endogenous sample selection and gain degrees of freedom (Guariglia, 2006). The following specification is used:

$$(LEV/A)_{it} = \beta_0 + \beta_{11}(LEV/A)_{it-1} * IVFC_{it} + \beta_{12}(LEV/A)_{it-1} * PNIFC_{it} + \beta_{13}(LEV/A)_{it-1} * NIFC_{it} + \beta_{21}(Cash\ Flow/A)_{it} * IVFC_{it} + \beta_{22}(Cash\ Flow/A)_{it} * PNIFC_{it} + \beta_{23}(Cash\ Flow/)_{it} * NIFC_{it} + \beta_3(LogSales)_{it} + \beta_4(Sales\ Growth)_{it} + \beta_5(STRUC)_{it} + \beta_6 TAX)_{it} + v_i + v_t + \varepsilon_{it} \quad (3.18)$$

where the variables are as defined previously and the lagged dependent variable and the cash flow variable are interacted in turn with the dummy variables *IVFC, PNIFC* and *NIFC*[42]. As discussed previously, *IVFC* firms (firms with negative cash flow) would possibly have more debt in their capital structure leading to a positive relationship between debt and negative cash flow for these firms. However, it might also be the case that these firms would avoid taking debt (due to inability to service debt) in which case the relationship between leverage and negative cash flow would be negative. For the *PNIFC* and *NIFC* firms (firms with positive cash flow), we would expect the relationship between leverage and cash flow to be positive if the TOT holds but negative if the POT holds.

[42] *IVFC* firms are *VERY INTERNALLY FINANCIALLY CONSTRAINED* (negative cash flow). *PNIFC* firms are *POSSIBLY NOT INTERNALLY FINANCIALLY CONSTRAINED* (cash flow in the lowest quartile of the distribution). *NIFC* firms are *NOT INTERNALLY FINANCIALLY CONSTRAINED* (cash flow in the top 3 quartiles of the distribution of all positive cash flows.)
We also separate our firms in two classes, those that have positive cash flows and those that have negative cash flows. The results are reported in Table 3.11.

To check the robustness of our results, we use a similar regression but the cash flow variable is replaced with a profitability measure.

$$(LEV/A)_{it} = \beta_0 + \beta_{11}(LEV/A)_{it-1} * IVFC_{it} + \beta_{12}(LEV/A)_{it-1} * PNIFC_{it} + \beta_{13}(LEV/A)_{it-1} * NIFC_{it} + \beta_{21}(PROFIT/A)_{it} * IVFC_{it} + \beta_{22}(PROFIT/A)_{it} * PNIFC_{it} + \beta_{23}(PROFIT/A)_{it} * NIFC_{it} + \beta_3(Log\ Sales)_{it} + \beta(Sales\ Growth)_{it} + \beta_5(Structure)_{it} + \beta_6(Tax)_{it} + v_i + v_t + \varepsilon_{it} \quad (3.19)$$

where the variables are as defined previously and the lagged dependent variable and the profitability variable are interacted in turn with the dummy variables *IVFC, PNIFC* and *NIFC*, this time classified by industry and year according to their level of profits.

3.17.2 ACCOUNTING FOR (OVERALL) FINANCIAL CONSTRAINTS

In this section, we go a step further and examine the impact of both internal and external constraints on debt policy decisions of firms. In this way, we capture overall financial constraints which refer to how easy or difficult it is for a firm to get access to debt. It would be interesting to study the behaviour of firms depending on how easily they can get access to debt finance. The POT, for instance suggests that firms that have low cash flows would have more debt in their capital structure while firms that have high cash flows would have lower debt.

But we also have to consider the fact that in some cases firms might not have easy access to debt in which case the presence or absence of overall (both internal and overall) financial constraints would affect the relationship between leverage and cash flow. This would give rise to three scenarios as illustrated below:

Scenario 1: If a firm is internally financially unconstrained, in this case access to debt will not matter. Hence overall the firm is financially unconstrained.

Scenario 2: If a firm is internally financially constrained, in this case access to debt matters. If the firm has easy access to debt, then overall, the firm is financially unconstrained.

Scenario 3: If a firm is internally financially constrained, in this case access to debt matters. If the firm has no access to debt, then overall, the firm is financially constrained.

To account for the presence of overall financial constraints, we interact the cash flow term with size measures. First, we distinguish among firms by classifying them according to the distribution of their real assets (see section 3.15). In other words, we investigate if the size of a firm affects the relationship between debt and cash flow using the following empirical specification:

$$(LEV/A)_{it} = \beta_0 + \beta_{11}(LEV/A)_{it-1} * FC_{it} + \beta_{12}(LEV/A)_{it-1} * LLFC_{it} + \beta_{13}(LEV/A)_{it-1} * NFC_{it} + \beta_{21}(Cash\ Flow/A)_{it} * FC_{it} + \beta_{22}(Cash\ Flow/A)_{it} * LLFC_{it} + \beta_{23}(Cash\ Flow/A)_{it} * NFC_{it} + \beta_3(Log\ Sales)_{it} + \beta_4(Sales\ Growth)_{it} + \beta_5(Structure)_{it} + \beta_6(Tax)_{it} + v_i + v_t + \varepsilon_{it} \quad (3.19)$$

where the variables are as defined previously but the cash flow variable is interacted in turn with the dummy variables FC_{it}, $LLFC_{it}$ and NFC_{it}[43]. These dummies are used in the leverage regressions as interactions on the cash flow term to control for access to external finance. The reason for doing this is that we want to investigate what happens to the relationship between debt and cash flow at unquoted firms when we take into account firms' access to external finance.

To check for the robustness of our results, we use the following specification:

$$(LEV/A)_{it} = \beta_0 \beta_{11}(LEV/A)_{it-1} * RISKY_{it} + \beta_{12}(LEV/A)_{it-1} * SAFE_{it} + \beta_{13}(LEV/A)_{it-1} * SECURE_{it} + \beta_{21}(Cash\ Flow/A)_{it} * RISKY_{it} + \beta_{22}(Cash\ Flow/A)_{it} * SAFE_{it} + \beta_{23}(Cash\ flow/A)_{it} * SECURE_{it} + \beta_3(Log\ Sales)_{it} + \beta_4(Sales\ Growth)_{it} + \beta_5(Structure)_{it} + \beta_6(Tax)_{it} + v_i + v_t + \varepsilon_{it} \quad (3.20)$$

where the variables are as defined previously but the cash flow variable is interacted in turn with the dummy variables $RISKY_{it}$, $SAFE_{it}$ and $SECURE_{it}$ based on firms' Quiscore measures are as defined in section 3.15.

3.17.3 REGRESSION RESULTS: INTERNAL CONSTRAINTS

In column 1 of Table 3.9, we investigate how internal financial constraints affect the debt level in unquoted firms. The results generally point towards a negative relationship between debt and cash flow for all the three categories of firms defined in section 3.15. There is a negative relationship between negative cash flow and debt.

[43] *FC* firms have their real assets in the bottom quartile of the distribution of all real assets while *LLFC* firms have their real assets in the middle quartile of the distribution of all real assets, finally *NFC* firms have their real assets in the top quartile of the distribution of all real assets, all classified by industry and by year.

This suggests that as negative cash flow goes up (that is there is a deterioration in the internal finance of the firm) firms reduce debt in their capital structure. What this result essentially says is that the higher the negative cash flows of a firm, the less debt it will have in its capital structure. This would imply that debt servicing is a very important factor that firms take into account while deciding what sources of finance to use. Firms that have negative cash flows might be debt dependent but they might also be debt conservative as they might not want high debt levels which can possibly lead to bankruptcy.

As negative cash flow decreases, the firm starts to borrow (possibly due to an improvement in its balance sheet situation) and consequently has higher debt in its capital structure. The coefficient on the cash flow variable for firms with medium cash flows (*PNFC firm-years*) although positive (0.108) is insignificant. Hence, we cannot really say what is happening to debt levels in these firms. It could possibly be the case that these unquoted firms being more debt dependent cannot really reduce debt in their capital structure even when they have positive but low levels of cash flows. For firms that have high cash flows (*NFC firm-years*), there is a negative and significant relationship between cash flow and debt (-0.251) that confirms the POT suggesting that firms that have positive cash flows tend to reduce debt in their capital structure as they experience an improvement in their internal financing capacity.
If we look at the magnitude of coefficients -0.651 for *IFC* firms, and -0.251 for *NFC* firms, the results suggest that firms that have negative cash flows are much more debt conservative as a deterioration in their balance sheet would lead them to reduce debt by a more significant amount than firms that have positive cash flows. Firms with positive cash flows tend to reduce debt in their capital structure when they experience an increase in cash flows but they still remain quite debt dependent.

Similar results are obtained when as robustness check; we consider profitability as a measure of internal finance (column 2 of Table 3.9). The other robustness check we try is that instead of considering three classes of firms, we consider two classes of firms, those with negative cash flows and others with positive cash flows. The results shown in Table 3.11 are robust, indicating that the negative relationship between leverage and cash flow holds across the distribution of cash flows of firms possibly leading to an inverted U-shaped relationship between these two important sources of finance for firms.

These results suggest that although unquoted firms are a more debt dependent, they avoid taking debt when they have high negative cash flows and repay debt when they experience an increase in their cash flows. This points towards a debt-conservative behaviour of firms in that internally generated funds are the most preferred source of financing of firms whatever the level of their cash flows. It also indicates that firm are financially conservative and they inherently do not like debt.

3.17.4 REGRESSION RESULTS: OVERALL FINANCIAL CONSTRAINTS

The results when we consider overall financial constraints are given in Table 3.10. The negative relationship between debt and cash flow still holds when we take into account the ease or difficulty with which firms get access to external financing. The coefficients obtained on the *FC, LLFC* and *NFC* dummies are -0.274, -0.301 and -0.393 respectively that indicate that overall constraints do not really influence the negative relationship between leverage and cash flow. However, when we look at the magnitude of the coefficients it seems that firms that get the easiest access to external finance are the most debt-conservative firms. This can be explained by the fact that many large firms in the real world operate with very low levels of leverage while some do not have any leverage at all.

The fact that a firm can borrow does not seem to affect the negative relationship between debt and cash flow. The result makes sense if we consider the fact that the major factor that affects whether or not a firm takes debt is the ability of the firm to service debt, which in turn depends on the cash flows of the firm, that is its internal financial constraints. Therefore it is not surprising that the size of firms; the overall financial constraint, does not seem to affect the relationship between debt and cash flow. Therefore, small, medium and large unquoted firms avoid taking debt in their capital structure. This result seems to suggest that firms have an inherent characteristic that makes them avoid debt. It also suggests that internal constraints are much more relevant and they influence overall constraints.

As a robustness check, we consider another measure of overall financial constraints which is the Quiscore measure. The Quiscore is a measure of the likelihood of company failure in the twelve months following the date of calculation and this measure is used to account for overall financial constraints (see section 3.15). Once again, the results we obtained as shown in column 2 of Table 3.10, are robust to those obtained previously and indicate that however easy it is for a firm to get access

to external financing, it would not take debt in its capital structure unless if faces a shortage of internal funds. It is obvious that in a developed financial system as in the UK, firms would not face problems in obtaining external finance if they really need it and therefore not surprising that internal financial constraint matter more than overall financial constraints.

3.18 CONCLUSION

We examine the relationship between firm leverage and cash flow at unquoted firms in the UK since these are the two most important sources of finance of most firms. Our results suggest that the relationship between debt and cash flow can be better explained by the POT. Cash flow is a vital source of financing of firms and they seem to follow a financial hierarchy when deciding what sources of finance to use. If firms experience an increase in cash flow, they tend to reduce the amount of debt they hold, possibly by paying off debt but if cash flow falls firms would increase leverage in their capital structure.

We further investigate this negative relationship by taking into account internal financial constraints and overall financial constraints. We find that internal financial constraints are the main factors that influence the amount of debt that a firm has in its capital structure. Even if firms have negative cash flows they do not increase their leverage, although these firms are likely to be more debt dependent. The results obtained when firms are distinguished according to the level of overall financial constraints, seem to suggest that however large a firm might be and however easy it is for a firm to have access to debt, firms inherently do not like to increase debt in their capital structure. The crux of the problem is then whether managers want to go for external financing. Our results seem to indicate that firms in the UK are financially conservative. They prefer to pay back debt when they experience an increase in their cash flows rather than borrowing more say to invest and they prefer to have less debt when they have negative or low cash flows, possibly to avoid the risk of bankruptcy.

All of this implies a major reliance of firms, especially unquoted ones, on cash flow. Hence these firms might be constricting their performance according to their cash flows. This has important implications on growth as it suggests that if these firms had been less debt averse (both when cash flows are negative or positive) perhaps they could grow more. An interesting and related issue that could be

investigated here could be the reason why cash flow is so important and what are the factors that influence firms to hold cash. Another interesting study would be to investigate the relationship between cash flow and the various components of debt for instance short-term debt and long-term debt. These issues would be investigated in future research.

Part I of this chapter focussed on listed firms in the UK while Part II examined the leverage decisions on unlisted firms in the UK. We compare and contrast, in detail, the results obtained for listed and unlisted firms in Part I and Part II of this chapter in Chapter 7. At first glance, the results obtained seem to suggest that the leverage decisions of listed firms in the UK can be explained to some extent by both the Trade off Theory and the Pecking Order Theory. On the other hand, the leverage decisions of unlisted firms in the UK seem to be better explained by the Pecking Order Theory. Hence we can conclude that SMEs in the UK face a more pronounced hierarchy in their sources of finance, among which their most preferred source of financing is internal finance.

3.19 DATA APPENDIX:QUOTED FIRMS

TABLE 3.A: MANUFACTURING SECTOR			
Number of years	Frequency	Percent	Cumulative
4	179	1.37	1.37
5	237	1.81	3.17
6	198	1.51	4.68
7	242	1.85	6.53
8	220	1.68	8.21
9	246	1.88	10.08
10	186	1.42	11.50
11	324	2.47	13.97
12	433	3.30	17.28
13	435	3.32	20.59
14	305	2.33	22.92
15	354	2.70	25.62
16	453	3.46	29.08
17	433	3.30	32.38
18	589	4.49	36.87
19	540	4.12	40.99
20	461	3.52	44.51
21	375	2.86	47.37
22	316	2.41	49.78
23	158	1.21	50.98
24	187	1.43	52.41
25	219	1.67	54.08
26	288	2.20	56.28
27	326	2.49	58.76
28	464	3.54	62.30
29	552	4.21	66.51
30	671	5.12	71.63
31	671	5.12	76.75
32	1,358	10.36	87.11
33	1,690	12.89	100.00
Total	13,110	100.00	

The data source for this analysis is the Datastream advance database provided by Thompson financial. The database contains accounting data for approximately 1,800 UK firms quoted on the London Stock Exchange. The database lists all the firms with available accounting data at the time of downloading. Data is collected over the 1968-2000 period. We focus only on manufacturing firms that operate in the following industries: Metal and Metal goods, Other Minerals and Mineral products, Chemicals and man-made fibres, Mechanical Engineering, Electrical and Instrument Engineering, Motor Vehicles and Parts, Other Transport Equipment, Food, Drink and Tobacco, Textiles, Clothing, Leather and Footwear and Other Manufacturing. We exclude firms that have less than 3 consecutive years of observations.

DEFINITIONS OF VARIABLES USED

(LEV/A) : net book leverage (*LEV*), calculated as total borrowing repayable in less than 1 year plus total loan capital repayable in 1 year or more divided by total assets.

(CF/A): cash flow, calculated as profit after tax and preference dividends plus depreciation divided by total assets.

(Cashstock/A): stock of cash calculated as the sum of cash, bank deposits, short-term loans and deposits and investments shown under current assets.

(Current Assets): includes stocks, work in progress, trade and other debtors, cash equivalent and any other current assets. Trade accounts receivable after 1 year are also included.

(Liquid/A): liquid assets calculated as current assets minus current liabilities scaled by assets.

(Profit/A): profit after tax scaled by assets.

(Log Sales): log of real sales.

(INV/A): investment scaled by assets.

(Retained/A): retained earnings scaled by assets.

(Q): Tobin's Q calculated as the enterprise value plus total loan capital minus total cash and cash equivalent divided by the replacement value of assets.

(TAX/PROFIT): tax paid as a ratio of profit before tax.

New equity: Net equity issued for cash and acquisition. This is only available up to 1991, until the introduction of the cash flow standard FRS1 and FRS1(Rev) which became compulsory in March 1992. Figures are net of share repurchases.

TABLE 3.1:SUMMARY STATISTICS (Listed Firms)

	Full Sample	*Low Real Assets*	*High Real Assets*	*Low Coverage*	*High Coverage*	*High Leverage*	*Low Leverage*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
$(LEV/A)_{it}$	*0.146*	*0.109*	*0.157*	*0.213*	*0.119*	*0.183*	*0.023*
	(0.100)	*(0.101)*	*(0.096)*	*(0.084)*	*(0.092)*	*(0.082)*	*(0.029)*
$(STD)_{it}$	*0.077*	*0.072*	*0.078*	*0.111*	*0.063*	*0.096*	*0.014*
	(0.071)	*(0.078)*	*(0.068)*	*(0.075)*	*(0.064)*	*(0.070)*	*(0.020)*
$(LTD)_{it}$	*0.069*	*0.037*	*0.079*	*0.102*	*0.056*	*0.087*	*0.010*
	(0.073)	*(0.056)*	*(0.074)*	*(0.079)*	*(0.066)*	*(0.073)*	*(0.019)*
$(Net\ LEV)_{it}$	*0.017*	*-0.014*	*0.026*	*0.129*	*-0.072*	*0.064*	*-0.140*
	(0.143)	*(0.151)*	*(0.139)*	*(0.103)*	*(0.101)*	*(0.123)*	*(0.076)*
(Cash	*0.132*	*0.130*	*0.133*	*0.084*	*0.170*	*0.122*	*0.165*
$Flow/A)_{it}$	*(0.070)*	*(0.080)*	*(0.067)*	*(0.055)*	*(0.055)*	*(0.067)*	*(0.067)*
$(Profit/A)_{it}$	*0.093*	*0.088*	*0.094*	*0.045*	*0.131*	*0.083*	*0.127*
	(0.067)	*(0.079)*	*(0.064)*	*(0.053)*	*(0.050)*	*(0.064)*	*(0.065)*
$(Cashstock/A)_{it}$	*0.069*	*0.072*	*0.068*	*0.049*	*0.077*	*0.056*	*0.114*
	(0.086)	*(0.102)*	*(0.080)*	*(0.065)*	*(0.091)*	*(0.073)*	*(0.107)*
$(Retained/A)_{it}$	*0.034*	*0.035*	*0.034*	*0.007*	*0.045*	*0.029*	*0.051*
	(0.041)	*(0.044)*	*(0.039)*	*(0.045)*	*(0.033)*	*(0.040)*	*(0.037)*
$(Liquid/A)_{it}$	*0.240*	*0.269*	*0.231*	*0.189*	*0.260*	*0.218*	*0.313*
	(0.140)	*(0.156)*	*(0.133)*	*(0.126)*	*(0.140)*	*(0.130)*	*(0.146)*
$(Log\ Sales)_{it}$	*6.659*	*4.980*	*7.160*	*6.776*	*6.613*	*6.869*	*5.925*
	(1.526)	*(0.664)*	*(1.342)*	*(1.585)*	*(1.500)*	*(1.525)*	*(1.282)*
$(INV/A)_{it}$	*0.040*	*0.039*	*0.040*	*0.053*	*0.034*	*0.040*	*0.040*
	(0.043)	*(0.045)*	*(0.042)*	*(0.034)*	*(0.044)*	*(0.042)*	*(0.043)*
$(Q)_{it}$	*2.817*	*2.564*	*2.892*	*2.385*	*2.986*	*2.886*	*2.583*
	(2.492)	*(2.500)*	*(2.484)*	*(1.936)*	*(2.659)*	*(2.434)*	*(2.665)*
$(Tax)_{it}$	*0.415*	*0.394*	*0.421*	*0.336*	*0.471*	*0.401*	*0.461*
	(0.242)	*(0.273)*	*(0.231)*	*(0.288)*	*(0.182)*	*(0.241)*	*(0.217)*
Sample size	*11761*	*2579*	*8661*	*3225*	*8015*	*8628*	*2612*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time where t=1968-2000. *(LEV/A)* is the sum of long-term and short-term debt divided by assets. The other measures of leverage are long-term debt over assets *(LTD/A),* short-term debt over assets *(STD/A*) and net leverage *(Net LEV/A*). *(CF/A)* is cash flow divided by assets, our main measure of liquidity. Other measures of liquidity of firms that we use include the cash stock *(Cashstock/A),* retained earnings *(Retained/A)* and Liquid *(Liquid/A)* which is the difference between current assets and current liabilities. *(Log Sales)* is the log of sales and *(INV/A)* is the firm's investment as a percentage of assets, we use a Tobin's Q *(Q)* to proxy for growth opportunities and *(TAX*) is the proportion of tax paid as a percentage of profit that proxies for tax rate. In column (2) and (3) descriptive statistics are presented for firm-years that have their real assets in the lowest 25th percentile of the distribution of the real assets, classified by industry and year and firm years having their real assets in the top 3 quartiles of the distribution of all assets, classified by industry and year, respectively. In columns (4) and (5) descriptive statistics are presented for firm-years according to their coverage ratios. In column (6) and (7) descriptive statistics are presented for firm-years according to their level of indebtedness.

TABLE 3.2: REGRESSION RESULTS (Listed Firms)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$(LEV/A)_{it-1}$	0.429***	0.259***	0.325***	0.489***	0.505***	0.452***	0.439***
	(0.031)	(0.023)	(0.032)	(0.036)	(0.034)	(0.031)	(0.030)
(INTERNAL FINANCE/A)$_{it}$	-0.527***	-1.437***	-0.373***	-0.189***	-0.109*	-0.574***	-0.345***
	(0.055)	(0.059)	(0.050)	(0.045)	(0.059)	(0.073)	(0.036)
$(Log\ Sales)_{it}$	0.018*	0.022**	0.019***	0.002	0.015	0.019*	0.038***
	(0.010)	(0.011)	(0.010)	(0.008)	(0.014)	(0.011)	(0.011)
$(INV/A)_{it}$	0.168***	0.220***	0.106	0.042	-0.169	0.121	-0.106
	(0.075)	(0.076)	(0.070)	(0.060)	(0.128)	(0.081)	(0.077)
$(Q)_{it}$	0.006***	0.006***	0.006***	0.001	0.001	0.005***	0.002
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
$(TAX)_{it}$	0.019*	0.010	-0.002	0.019***	-0.014	-0.006	-0.007
	(0.012)	(0.012)	(0.011)	(0.008)	(0.014)	(0.012)	(0.011)
Sample size	3809	3776	3809	3809	3809	3809	3809
J	0.341	0.304	0.443	0.388	0.126	0.462	0.510
m2	0.942	0.144	0.740	0.752	0.579	0.716	0.424

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it,}$ $(Cashflow/A)_{i}$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Time dummies are included in all specifications as regressors and instruments. In column (1), we use an overall debt level as the dependent variable, measured as short term debt plus long term debt. In column (2) we use the net debt measure as the dependent variable. In column (3) we use long-term debt as the dependent variable while in column (4) we use short-term debt as the dependent variable. In columns (1), (2), (3) and (4) we use cash flow as our measure of internal finance. In columns (5), (6) and (7), we check for the robustness of our results by considering alternative measures of internal financing. In column (5), we use a cash stock measure *(Cashstock/A*) as our measure of internal finance. In column (6) we use retained earnings of firms' (*Retained/A)* as our measure of internal finance. In column (7) we use a liquid assets measure *(Liquid/A*) calculated as current assets minus current liabilities and represent those assets such as debtors and stock that can be readily converted into cash. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see notes to Tables 3.1.

TABLE 3.3: EFFECT OF FINANCIAL CONSTRAINTS (Listed Firms)

Financial Constraints Measured by	*Real Assets (1)*	*Real Assets (2)*	*Coverage Ratio (3)*	*Indebtedness (4)*
$(LEV/A)_{it-1}$*CONS	0.390***	0.464***	0.396***	0.387***
	(0.051)	(0.075)	(0.037)	(0.035)
$(LEV/A)_{it-1}$*UNCONS	0.440***	0.442***	0.457***	0.463***
	(0.035)	(0.038)	(0.038)	(0.057)
$(Log\ Sales)_{it}$	0.004	0.005	0.004	0.007
	(0.013)	(0.013)	(0.013)	(0.012)
$(INV/A)_{it}$	0.160***	0.224***	0.196***	0.118*
	(0.088)	(0.092)	(0.093)	(0.081)
$(Q)_{it}$	0.005**	0.003*	0.004**	0.003**
	(0.002)	(0.002)	(0.002)	(0.002)
$(TAX)_{it}$	0.013	0.013	0.007	0.011
	(0.013)	(0.013)	(0.013)	(0.012)
$(CASHFLOW/A)_{it}$*CONS $_{it}$	-0.476***	--	-0.331***	-0.349***
	(0.086)		(0.083)	(0.059)
$(CASHFLOW/A)_{it}$*UNCONS $_{it}$	-0.584***	--	-0.523***	-0.647***
	(0.069)		(0.063)	(0.063)
$(PROFIT/A)_{it}$*CONS $_{it}$	--	-0.375***	--	--
		(0.091)		
$(PROFIT/A)_{it}$*UNCONS $_{it}$	--	-0.527***	--	--
		(0.074)		
Sample size	3809	3809	3809	3809
J	0.166	0.062	0.044	0.165
m2	0.950	0.869	0.878	0.960

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. In column (1), we interact the cash flow term with a dummy that equals to one if the firm is financially constrained, zero otherwise and a dummy equal to 1 if the firm is financially unconstrained, zero otherwise. The cut-off points are at the 25th percentile. The instruments used therefore are $(LEV/A)_{it}$*$CONS_{it,}$ $(LEV/A)_{it}$*$UNCONS_{it,}$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$,$(Tax)_{it}$,$(CASHFLOW/A)_{it}$*$CONS_{it}$ and $(CASHFLOW/A)_{it}$*$UNCONS_{it}$ all lagged two to five times. In column (2), we replace the cash flow measure with a profitability measure to check the robustness of our results. The instruments used therefore are $(LEV/A)_{it}$*$CONS_{it,}$ $(LEV/A)_{it}$*$UNCONS_{it}$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$, $(Tax)_{it,}$ $(PROFIT/A)_{it}$*$CONS$ and $(PROFIT/A)_{it}$*$UNCONS$ all lagged two to five times. In column (3), we distinguish between constrained and unconstrained firms according to their coverage ratio while in column (4), we distinguish between constrained and unconstrained firms according to their level of indebtedness. Time dummies are included in all specifications as regressors and instruments. When we test for the statistical significance of the coefficients on the lagged dependent variables and the cash flow variables interacted with the constrained and unconstrained dummies, the F-statistics obtained suggest that the coefficients on the lagged dependent variable for constrained and unconstrained firms in all cases are statistically different from each other, suggesting that constrained and unconstrained firms indeed behave differently. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see notes to Tables 3.1 and 3.2.

Table 3.4:Financial Constraints (Listed Firms) ***Robustness Checks***		
Financial Constraints Measured by	*Real Assets*	*Indebtedness*
	(2)	*(3)*
$(LEV/A)_{it-1}*CONS_{it}$	*0.416***	*0.387****
	(0.048)	*(0.035)*
$(LEV/A)_{it-1}*UNCONS_{it}$	*0.450****	*0.463****
	(0.037)	*(0.057)*
$(Log\ Sales)_{it}$	*0.005*	*0.006*
	(0.013)	*(0.012)*
$(INV/A)_{it}$	*0.154****	*0.118*
	(0.089)	*(0.081)*
$(Q)_{it}$	*0.005****	*0.003***
	(0.002)	*(0.002)*
$(TAX)_{it}$	*0.017*	*0.011*
	(0.013)	*(0.012)*
$(CASHFLOW/A)_{it}*CONS_{it}$	*-0.529****	*-0.349****
	(0.083)	*(0.059)*
$(CASHFLOW/A)_{it}*UNCONS_{it}$	*-0.569****	*-0.647****
	(0.069)	*(0.063)*
Sample size	*3809*	*3089*
J	*0.189*	*0.165*
m2	*0.971*	*0.960*

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. In columns (1) and (2) of Table 3.5 we interact the cash flow term with a dummy that equals to one if the firm is financially constrained and 0 if the firm is financially unconstrained. The instruments used are therefore are $(LEV/A)_{it}*CONS_{it}$, $(LEV/A)_{it}*UNCONS_{it}$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$, $(Tax)_{it}$, $(CASHFLOW/A)_{it}*CONS$ and $(CASHFLOW/A)_{it}*UNCONS$ all lagged two to five times. In column (1) we distinguish between financially constrained and unconstrained firms using the distribution of real assets but a cut-off point at the 30th percentile rather the 25th percentile. In column (2), we use the distribution of leverage to distinguish among financial constraints and again the cut-off point used is at the 30th percentile rather than the 25th percentile. Time dummies are included in all specifications as regressors and instruments. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see notes to Tables 3.3.

3.20 DATA APPENDIX :UNQUOTED FIRMS

Table 3.B STRUCTURE OF UNBALANCED PANEL			
Number of Observations	Freq.	Percent	Cum.
3	673	0.83	0.83
4	1,306	1.6	2.43
5	1,651	2.02	4.45
6	1,637	2.01	6.46
7	2,859	3.51	9.96
8	3,234	3.97	13.93
9	14,950	18.33	32.26
10	55,153	67.63	99.89
11	93	0.11	100
Total	81,556	100	

FAME is a database that contains information for companies in the UK and Ireland. The FAME database is collected by Jordans Bureau Van Dijk for commercial use. The Bureau Van Dijk Electronic Publication Database is developed by a group of specialised researchers based in Bureau Van Dijk Electronic Publishing's Brussels office. This database includes balance sheet data, profit and loss statements and some other complimentary information. This amounts to over 1.3 million companies. FAME allows detailed financial analysis and credit risk assessment, corporate finance, venture capital and mergers and acquisitions research, research and business development and also academic study and teaching.

DEFINITIONS OF VARIABLES USED

(LEV/A) : net book leverage, calculated as total borrowing repayable in less than one year plus total loan capital repayable in one year or more divided by total assets.

(LTD/A): long-term debt ratio, calculated as total borrowing repayable in one year or more divided by total assets.

(STD/A): short-term debt ratio, calculated as total borrowing repayable in less than one year divided by total assets.

(Cash Flow/A):cash flow, calculated as profit after tax and preference dividends plus depreciation divided by total assets.

(Log Sales)*:* log of real sales.

(Sales Growth): sales growth calculated as the change in log of real sales.

(Tax/Profit)*:* tax paid as a ratio of profit before tax.

(Structure/A): ratio of tangible assets to total assets.

QUISCORE

The Quiscore is a measure of the likelihood of company failure in the twelve months following the date of calculation. It is basically a measure of how risky a firm is and is calculated using a number of criteria by Qui Score Assessment Ltd. The quiscore measure of risk can be categorised in 5 bands as shown in the table below, however for our analysis, we categorise firms using the Quiscore measure in three categories. Firms in the first band are called *SECURE*, firms in the Stable and Normal band are called *SAFE* while firms in the Unstable and High Risk Band are called *RISKY (see main text for more details).*

Band Name	Score	Band Description
Secure Band	81-100	Companies in this band tend to be large and successful public companies. Failure is very unusual.
Stable Band	61-80	Company failure is a rare occurrence and will only come about if there are major company or marketplace changes.
Normal Band	41-60	The sector contains many companies that do not fail, but some that do.
Unstable Band	21-40	Companies in this band are on average four times more likely to fail than those in the Normal Band.
High Risk Band	0-20	Companies in the High-Risk band are unlikely to be able to continue trading unless significant remedial action is undertaken.

Source: Qui Score Assessment Ltd.

Table 3.5: *SUMMARY STATISTICS (UNQUOTED FIRMS)*

$(LEV / A)_{it}$	*0.330*
	(0.206)
$(LTD / A)_{it}$	*0.150*
	(0.162)
$(STD / A)_{it}$	*0.208*
	(0.202)
$(Cash\ Flow / A)_{it}$	*0.117*
	(0.112)
$(Profit / A)_{it}$	*0.051*
	(0.086)
$(Log\ Sales)_{it}$	*8.978*
	(1.177)
$(Sales\ Growth)_{it}$	*0.077*
	(0.318)
$(Structure)_{it}$	*0.300*
	(0.192)
$(Tax/Profit)_{it}$	*0.341*
	(0.428)
Real Assets	*11102.83*
	(26267.61)
Employees	*177.721*
No. of observations	*80718*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time where t=1994-2003. *(LEV/A)* is the sum of long-term and short-term debt divided by assets. The other measures of leverage are long-term debt over assets *(LTD/A),* short-term debt over assets *(STD/A*). *(Cash Flow/A)* is cash flow divided by assets*, (Log Sales)* is the log of sales and *(Structure)* is the ratio of tangible assets to assets, we use a sales growth measure *(SalesG)* to proxy for growth opportunities and *(Tax/Profit*) is the proportion of tax paid as a percentage of profit.

Table 3.6:SUMMARY STATISTICS(UNQUOTED FIRMS)

	Internally Very Financially constrained *Negative cash flow*	***Possibly not Internally Financially Constrained*** *Medium cash flow*	***Not Internally Financially constrained*** *High cash flow*
	(1)	*(2)*	*(3)*
No. of observations	*8727*	*16283*	*50591*
$(LEV / A)_{it}$	*0.454*	*0.379*	*0.293*
	(0.227)	*(0.218)*	*(0.183)*
$(LTD / A)_{it}$	*0.187*	*0.165*	*0.137*
	(0.200)	*(0.179)*	*(0.145)*
$(STD / A)_{it}$	*0.330*	*0.246*	*0.171*
	(0.258)	*(0.211)*	*(0.165)*
$(Cash\ Flow / A)_{it}$	*-0.071*	*0.043*	*0.173*
	(0.069)	*(0.029)*	*(0.083)*
$(Profit/A)_{it}$	*-0.100*	*0.004*	*0.091*
	(0.065)	*(0.029)*	*(0.061)*
$(Log\ Sales)_{it}$	*8.914*	*8.949*	*9.019*
	(1.177)	*(1.152)*	*(1.179)*
$(Sales\ Growth)_{it}$	*-0.214*	*-0.061*	*0.043*
	(1.182)	*1.057*	*1.034*
$(Structure)_{it}$	*0.275*	*0.284*	*0.309*
	(0.195)	*(0.195)*	*(0.187)*
$(Tax/Profit)_{it}$	*0.229*	*0.258*	*0.383*
	(0.366)	*(0.677)*	*(0.321)*
$(Real\ Assets)_{it}$	*13791.87*	*13245.22*	*11487.49*
	(28747.11)	*(29954.65)*	*(24085.79)*
Employees	*185*	*164*	*182*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time and t=1994-2003. Descriptive statistics are presented for firm-years that have negative cash flow that is are *Internally Very Financially Constrained* (cash flow<0), firm years that are *Possibly not Internally Financially Constrained* (positive cash flow in the lowest quartile of the distribution of all positive cash flows, classified by industry and year) and firms that are *Not Internally Financially Constrained* (all firms having the cash flow in the top three quartiles of the distribution of all positive cash flows of all firms, classified by industry and year). Also see notes to Table 3.5.

Table 3.7:SUMMARY STATISTICS(UNQUOTED FIRMS)

	Small Firm-years (real assets) ***(1)***	***Medium Firm-years (real assets)*** ***(2)***	***Large Firm-years (real assets)*** ***(3)***
Number of observations	*22552*	*48624*	*22680*
(LEV /A)$_{it}$	*0.293*	*0.314*	*0.390*
	(0.195)	*(0.198)*	*(0.219)*
(LTD/A) $_{it}$	*0.123*	*0.141*	*0.191*
	(0.138)	*(0.151)*	*(0.193)*
(STD/A) $_{it}$	*0.202*	*0.194*	*0.239*
	(0.202)	*(0.188)*	*(0.222)*
(Cash Flow / A)$_{it}$	*0.126*	*0.117*	*0.110*
	(0.126))	*(0.109)*	*(0.109)*
(PROFIT / A)$_{it}$	*0.057*	*0.051*	*0.046*
	(0.099)	*0.082*	*0.083*
(Log Sales) $_{it}$	*7.658*	*8.695*	*10.226*
	(0.546)	*(0.658)*	*(0.908)*
(Sales Growth) $_{it}$	*-0.204*	*-0.000*	*0.054*
	(1.835)	*(0.943)*	*(0.642)*
(Structure/ A)$_{it}$	*0.264*	*0.313*	*0.308*
	(0.184)	*(0.193)*	*(0.191)*
(Tax /profit)$_{it}$	*0.303*	*0.348*	*0.351*
	(0.403)	*(0.413)*	*(0.467)*
(Real Assets) $_{it}$	*1099.182*	*4162.246*	*35930.05*
	(488.162)	*(2463.931)*	*(44977.63)*
Employees	*42*	*91*	*404*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time and t=1994-2003. Descriptive statistics are presented for firm-years that are *SMALL $_{it}$* (real assets in the lowest 25th percentile of the distribution of the real assets, classified by industry and year), firm years that are *MEDIUM $_{it}$* (real assets between the 25th and the 75th percentile of the distribution of the real assets, classified by industry and year) and *LARGE $_{it}$* (all firms having the real assets in the top 25th percentile of the distribution of all assets, classified by industry and year). Also see notes to Table 3.5.

Table 3.8:REGRESSION RESULTS (UNQUOTED FIRMS)
FIRST DIFFERENCE GMM ESTIMATORS

		Robustness Checks
	(1)	*(2)*
$(LEV/A)_{it-1}$	*0.486***	*0.492****
	(0.026)	*(0.026)*
$(Cash\ Flow / A)_{it}$	*-0.259****	
	(0.082)	
$(PROFIT/A)_{it}$		*-0.372****
		(0.113)
$(Log\ Sales)_{it}$	*-0.106****	*-0.104****
	(0.025)	*(0.025)*
$(Sales\ Growth)_{it}$	*-0.018*	*-0.204*
	(0.021)	*(0.022)*
$(Structure)_{it}$	*0.043*	*0.038*
	0.107	*0.106*
$(Tax/Profit)_{it}$	*0.014*	*0.005*
	(0.020)	*(0.020)*
Sample size	*14955*	*15102*
J	*0.934*	*0.944*
m2	*0.237*	*0.403*

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it}$,$(Cash\ Flow /A)_{i}$,$(Log\ Sales)_{it}$,$(Sales\ Growth)_{it}$,$(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to three times. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 3.5. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 3.9:FIRST DIFFERENCE GMM ESTIMATORS: ACCOUNTING FOR INTERNAL FINANCIAL CONSTRAINTS(UNQUOTED FIRMS)

	(cash flow) (1)	***ROBUSTNESS CHECKS (profitability) (2)***
$(LEV/A)_{it-1}*IVFC_{it}$	*0.339****	*0.342****
	(0.075)	*(0.066)*
$(LEV/A)_{it-1}*PNIFC_{it}$	*0.363****	*0.409****
	(0.059)	*(0.056)*
$(LEV/A)_{it-1}*NIFC_{it}$	*0.375****	*0.411****
	(0.041)	*(0.044)*
$(Cash\ Flow/A)_{it}*IVFC_{it}$	*-0.651****	
	(0.237)	
$(Profit/A)_{it}*IVFC_{it}$		*-0.676****
		(0.237)
$(Cash\ Flow/A)_{it}*PNIFC_{it}$	*0.108*	
	(0.384)	
$(Profit/A)_{it}*PNIFC_{it}$		*-1.098*
		(0.953)
$(Cash\ Flow/A)_{it}*NIFC_{it}$	*-0.251****	
	(0.083)	
$(Profit/A)_{it}*NIFC_{it}$		*-0.519****
		(0.125)
$(Log\ Sales)_{it}$	*-0.086****	*-0.094****
	(0.021)	*(0.213)*
$(Sales\ Growth)_{it}$	*0.005*	*0.000*
	(0.014)	*(0.014)*
$(Structure)_{it}$	*0.148***	*0.090*
	0.077	*(0.078)*
$(Tax)_{it}$	*0.013*	*0.008*
	(0.015)	*(0.013)*
Sample size	*14995*	*15102*
m2	*0.365*	*0.862*
J(p-value)	*0.553*	*0.894*

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(LEV/A)_{it-1}*IVFC_{it}$, $(LEV/A)_{it-1}*PNIFC_{it}$, $(LEV/A)_{it}*NIFC_{it-1}$, $(CF/A)_{it}*IVFC_{it}$, $(CF/A)_{it}*PNIFC_{it}$, $(CF/A)_{it}*NIFC_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to five times. In column 2, the instruments used are $(LEV/A)_{it-1}*IVFC_{it}$, $(LEV/A)_{it-1}*PNIFC_{it}$, $(LEV/A)_{it-1}*NIFC_{it-1}$, $(Profit/A)_{it}*IVFC_{it}$, $(Profit/A)_{it}*PNIFC_{it}$, $(Profit/A)_{it}*NIFC_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 3.5 and 3.6.* indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. The F-statistics obtained on the lagged dependent variables in column 1, *(F(3, 4798)= 34.39)* indicate that the coefficients obtained for the *IVFC, PNIFC* and *NIFC* firm-years are statistically different from each other. The F-statistics obtained on the cash flow variable in column 1 interacted with the *IVFC, PNIFC* and *NIFC* firm-years *(F(3, 4798)= 7.28)* again indicate that the coefficients obtained are statistically different from each other.

Table 3.10: FIRST DIFFERENCE GMM ESTIMATORS: ACCOUNTING FOR OVERALL CONSTRAINTS(UNQUOTED FIRMS)		
	(REAL ASSETS)	*ROBUSTNESS CHECKS*
	(1)	*(Quiscore)*
		(2)
$(LEV/A)_{it-1}*FC_{it}$	*0.397****	
	(0.077)	
$(LEV/A)_{it-1}*LLFC_{it}$	*0.386****	
	(0.044)	
$(LEV/A)_{it-1}*NFC_{it}$	*0.459****	
	(0.052)	
$(LEV/A)_{it-1}*RISKY_{it}$		*0.401****
		(0.088)
$(LEV/A)_{it-1}*SAFE_{it}$		*0.399****
		(0.040)
$(LEV/A)_{it-1}*SECURE_{it}$		*0.541****
		(0.100)
$(Cash\ Flow/A)_{it}*FC_{it}$	*-0.274***	
	(0.108)	
$(Cash\ Flow/A)_{it}*RISKY_{it}$		*-0.568***
		(0.314)
$(Cash\ Flow/A)_{it}*LLFC_{it}$	*-0.301****	
	(0.069)	
$(Cash\ Flow/A)_{it}*SAFE_{it}$		*-0.347****
		(0.067)
$(Cash\ Flow/A)_{it}*NFC_{it}$	*-0.393****	
	(0.087)	
$(Cash\ Flow/A)_{it}*SECURE_{it}$		*-0.652****
		(0.134)
$(Log\ Sales)_{it}$	*-0.081****	*-0.065****
	(0.023)	*(0.020)*
$(Sales\ Growth)_{it}$	*-0.005*	*-0.012*
	(0.013)	*(0.013)*
$(Structure)_{it}$	*0.078*	*0.055*
	(0.078)	*(0.079)*
$(Tax)_{it}$	*0.015*	*0.006*
	(0.013)	*(0.013)*
Sample size	*14955*	*14927*
m2	*0.323*	*0.334*
J(p-value)	*0.574*	*0.933*

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(LEV/A)_{it-1}*FC_{it}$, $(LEV/A)_{it-1}*LLFC_{it}$, $(LEV/A)_{i-1t}*NFC_{it}$, $(CF/A)_{it}*FC_{it}$, $(CF/A)_{it}*LLFC_{it}$, $(CF/A)_{it}*NFC_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(STRUC)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Instruments used in column 2 are $(LEV/A)_{it-1}*RISKY_{it}$, $(LEV/A)_{it-1}*SAFE_{it}$, $(LEV/A)_{it-1}*SECURE_{it}$, $(CF/A)_{it}*RISKY_{it}$, $(CF/A)_{it}*SAFE_{it}$, $(CF/A)_{it}*SECURE_{it}$, $(Log\ Sales)_{it}$, $(SalesG)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Time dummies are included in all specifications as regressors and instruments. Also see notes to Tables 3.5 and 3.8. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 3.11:FIRST DIFFERENCE GMM ESTIMATORS: ACCOUNTING FOR INTERNAL FINANCIAL CONSTRAINTS(UNQUOTED FIRMS)

	(cash flow)	***ROBUSTNESS CHECKS***
	(1)	***(profitability)***
		(2)
$(LEV/A)_{it-1}*NEGCF_{it}$	*0.411****	*0.434****
	(0.103)	*(0.085)*
$(LEV/A)_{it-1}*POSITIVECF_{it}$	*0.442****	*0.457****
	(0.051)	*(0.051)*
$(Cash\ Flow/A)_{it}*NEGCF_{it}$	*-0.506****	
	(0.372)	
$(Profit/A)_{it}*NEGCF_{it}$		*-0.760****
		(0.331)
$(Cash\ Flow/A)_{it}*POSITIVECF_{it}$	*-0.226*	
	(0.083)	
$(Profit/A)_{it}*POSITIVECF_{it}$		*-0.361****
		(0.125)
$(Log\ Sakes)_{it}$	*-0.078****	*-0.086****
	(0.032)	*(0.031)*
$(Sales\ Growth)_{it}$	*-0.013*	*-0.023*
	(0.019)	*(0.019)*
$(Structure)_{it}$	*0.146***	*0.093*
	(0.104)	*(0.102)*
$(Tax)_{it}$	*0.019*	*0.020*
	(0.018)	*(0.020)*
Sample size	*15185*	*15335*
m2	*0.499*	*0.849*
J(p-value)	*0.696*	*0.935*

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(LEV/A)_{it-1}*NEGCF_{it}$, $(LEV/A)_{it-1}*POSITIVECF_{it}$, $(Cash\ Flow/A)_{it}*NEGCF_{it}$, $(Cash\ Flow/A)_{it}*POSITIVECF_{it}$, $(Log\ Sales)_{it}$, $(Sales\ Growth)_{it}$, $(STRUC)_{it}$ and $(TAX)_{it}$ all lagged two to five times. Instruments used in column 2 are $(LEV/A)_{it}$, $(Profit/A)_{it}*NEGCF_{it}$, $(Profit/A)_{it}*POSITIVECF_{it}$, $(Log\ Sales)_{it}$, $(Sales\ Growth)_{it}$, $(Structure)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Time dummies are included in all specifications as regressors and instruments.* indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 3.A: DETERMINANTS OF CAPITAL STRUCTURE

DETERMINANTS	EXPECTED SIGNS	EMPIRICAL EVIDENCE
Liquidity (profitability and non-debt tax shield)	*-ve (POT)*	*Rajan and Zingales (1995), Shyam-Sunder and Myers (1999), Miguel and Pindado (2001), Fama and French (2002), Benito (2003)*
	+ve (TOT)	
Size	*-ve (POT)*	*Titman and Wessels (1988)*
	+ve (TOT)	*Rajan and Zingales (1995), Fama and French (2002), Frank and Goyal (2002) Benito (2003)*
Growth Opportunities	*+ve (POT)*	*Benito (2003)*
	-ve (TOT and complex POT)	*Fama and French (2002)*
Investment	*+ve (POT and TOT)*	*Benito (2003)*
Tax	*+ve (TOT)*	*Bradley et al (1984)*

CHAPTER 4

REVIEW OF LITERATURE

CHINA

4.0 INTRODUCTION

Most research on capital structure and financing decisions of firms have mainly focussed on large firms in western developed countries such as the UK and the US. Consequently there is a gap in this literature where some aspects of capital structure decisions have not been addressed. One of these is the capital structure decisions of small and medium-sized enterprises (SMEs) in developed countries, which was studied in the previous chapter. The second aspect is the capital structure of firms in developing countries or more specifically in transition economies, which has not been very prominent in this literature.

China is regarded as the largest developing and transitional economy in the world. It has one of the highest growth rates in the world. Most of this growth comes from the private sector despite the relative underdevelopment of the Chinese financial and legal system. The literature has recognised that a well developed financial system is necessary for growth. Despite the underdeveloped financial and legal system, the private sector is the catalyst of China's growth. We believe that by studying the capital structure of Chinese firms we will be able, to a certain extent, to explain this phenomenal growth.

Sources of external finance are limited in economies in transition. Firms in these economies can be heavily dependent on financing sources such as bank credit. Factors that affect the capital structure of firms in developed countries might not have the same effect on the capital structure of firms in transition economies. Due to the availability of good quality financial data, China is the ideal case to study these issues. In this chapter, we provide a historical account of the Chinese reforms and focus mainly on the reforms undertaken in the financial sector.

The chapter is organised as follows: in sections 4.1 and 4.2 we discuss the transition and reform process in China. Next, in section 4.3, we discuss finance and growth in the Chinese context. We then provide a detailed description of the Chinese financial system where we focus mainly on the banking sector and the stock market.

In section 4.5 we discuss the importance of foreign direct investment as this is the factor that has received a lot of attention especially in the Chinese case.

4.1 WHAT HAPPENS DURING TRANSITION?

The People's Republic of China is the largest developing and transitional economy in the world. China is administratively divided into 23 provinces, 5 autonomous regions, 4 centrally administrative municipalities and 2 special administrative regions. The currency used is the *Yuan*. China's transition from a planned economy to a market economy began at the end of 1978. The reform has been characterised as piecemeal, partial and even experimental as opposed to the big bang approach taken by Eastern European countries.

The traditional planned Chinese economy was characterised by a distorted macro policy characterised by artificially low interest rates and overvalued exchange rates. There were some serious problems with the system as capital was limited and the market interest rate was too high; foreign exchange was scarce and expensive because exportable goods were limited and primarily consisted of low-priced agricultural products; the economic surplus was small and scattered due to the nature of a poor agrarian economy (Lin, Cai and Li, 1996). The macropolicies created a total imbalance in the economy. Suppression of competition was prevalent and profits could not be used as a measure of the efficiency. Managers had no autonomy as all decisions were made by an administrative allocation system. Profit remittances by state enterprises were the norm.

In December 1978, the party leaders decided to undertake a program of gradual but fundamental reform of the economic system. First, they understood that being a centrally planned economy was not really working. Economic growth was stagnating and this had caused China to fall far behind not only the industrialized nations of the West but also their rivals, the new industrial powers of Asia: Japan, the Republic of Korea, Singapore, Taiwan, and Hong Kong. In the late 1970s, while Japan and Hong Kong could boast of rivaling European countries in modern technology, China was in a completely different situation. Second, the Chinese had to make do with barely sufficient food supplies, rationed clothing, inadequate housing, and a service sector that was inadequate and inefficient. Third, on the international platform China had no say in any matter.

4.2 REFORM PROCESS IN CHINA

Deng Xiaoping thoroughly changed Mao's course for China with a new catch-word, "reform," and a new aphorism, "To get rich is glorious."(Li, 2001)

China's reform process has been highly successful. When the reform began in 1978, it clearly had the "mandate" of the Chinese people. Turning away from an emphasis on revolutionary campaigns against "class enemies" of the Mao era, Deng and his associates stressed economic development and social stability (Li, 2001). Moving from a planned economy to a more market-oriented one created an economic success unparalleled by any countries. Between 1979 and 1997, the growth rate of China's Gross Domestic Product (GDP) was 9.8 percent annually, about three times greater than the world average. During the same period, 170 million people were lifted out of poverty. Chinese citizens' bank savings increased 220-fold, from 21 billion yuan (roughly U.S. $2.5 billion) to 4,628 billion yuan (about $560 billion). Below, we provide a survey of the main stages of this reform process.

The leaders at that time had no intention to leave behind communism, but they wanted to integrate the best features of capitalism and create what would be latter called 'socialism'. The major objective of the reform was to increase the role of the market and reduce state intervention and control. The major goals of the reform process were to increase exports and sort out the ailing industries such as transport, communications, coal, iron, steel, building materials, and electric power. Another objective was also to reduce investment in the heavy industry and increase investment in the light industry.

4.2.1 The Period of Readjustment, 1979-81

Private entrepreneurship and free market activities were legalized and encouraged in the 1980s, although the central authorities continuously had to fight the efforts of local government agencies to impose excessive taxes on independent merchants. First, agricultural production was targeted with a series of reforms. Farmers were encouraged to establish free markets. Some families were allowed to produce and sell at a profit. In industry, the main policy innovations increased the autonomy of enterprise managers, reduced emphasis on planned quotas, allowed enterprises to produce goods outside the plan for sale on the market, and permitted enterprises to

experiment with the use of bonuses to reward higher productivity. Some enterprises were allowed to pay a tax on their profits and retain the balance for reinvestment and distribution to workers as bonuses.

The establishment of collectively owned enterprises and private enterprise was actively encouraged to create employment which was a first since the Cultural Revolution. Enterprises were also allowed to engage in foreign trade and engage in direct negotiations with foreign firms. On the legal side, a wide range of cooperation, trading, and credit arrangements with foreign firms were legalized so that China could enter the mainstream of international trade.

To encourage foreign direct investment (FDI) four coastal economic zones were set up in 1979 where the FDI would receive special treatment. Three of the four zones--the cities of Shenzhen, Zhuhai, and Shantou--were located in Guangdong Province, close to Hong Kong. The fourth, Xiamen, in Fujian Province, was directly across the strait from Taiwan.

4.2.2 Reform and Opening, Beginning in 1982

Managers could hire and fire workers (although this still caused problems with bureaucrats and party cadres.) By 1985, most firms were allowed to pay taxes and retain the rest of their profits. This period also marked the shift from government budget allocations to interest bearing loans (which would later lead to the big problem of Non Performing Loans) but anyhow at least this was the first step towards a more market administered mechanism of credit allocation.

This period also marked the emergence of foreign trade. The value of trade (exports plus imports) rose steadily from 15% in 1980 to 21% in 1984 and to 35% in 1986. Under Deng Xiaoping foreign trade was regarded as an important source of investment funds and modern technology. Joint venture with foreign investors was made legal and even fully foreign owned businesses were possible.

In April 1984, more economic development zones were set up in the fourteen largest coastal cities - including Dalian, Tianjin, Shanghai, and Guangzhou-all of which were major commercial and industrial centers. These zones were to create productive exchanges between foreign firms with advanced technology and major Chinese economic networks. Additionally, domestic commerce also was stimulated by the reform policies, which were aimed to encourage a more market-based allocation of goods and services. (Source: *U.S. Library of Congress)*

4.2.3 Last two decades of reform

The reforms in the late 1980s and the early 1990s further focused on creating a pricing system and decreasing the role of the state in resource allocations. In the labour market especially, significant changes have occurred in the past 2 decades, including yielding more discretion to enterprises for wage-setting and permitting the retention of profits (Yueh, 2004). By the late 1990s, recruitment quotas for state enterprises were abolished and firms were largely allowed determine their own employment. Additionally, the 1990s was largely dominated by FDI. In 1992, the Chinese government decided to significantly liberalise its FDI regime. The government removed a number of sectoral and regional restrictions on FDI. The reforms of the late 1990s also focused on closing unprofitable enterprises and dealing with the insolvency in the banking system (which is discussed in more details below).

4.2.4 Future Steps

Obviously, the reform process is far from complete. More needs to be done at the governmental level: increase the transparency and consistency in the policy-making; reduce administrative interference in concrete matters; exercise correct public management in the economy and in society and reduce the burden that State-owned enterprises impose on the economy. Reforms in the financial sector is now of prime importance[44]. The financial system and security market system have shortcomings that result in inefficient allocation of finance resources, high percentage of bad debts, poor supervision of finance industry and high financial risk. The legal system has to be further reformed as legal systems protecting private assets are still incomplete, related tax policies, financial policies and investment service systems are still poor. Finally, the distribution system of social income is not reasonable while social security system is backward, endowment insurance, employment insurance and medical insurance not yet complete.

4.3 FINANCE AND GROWTH

Levine (2002) lists a number of functional reasons to link finance with improved economic performance. Financial systems facilitate the trading of risk, allocate capital, monitor managers, mobilise savings and ease the exchange of goods, services

[44] This is elaborated in the next section.

and financial contracts. Developed financial intermediaries facilitate the mobilisation of domestic capital. The legal based view proposed by LaPorta, Lopez-de-Silanes, Sheifer and Vishny (1999), predicts that the overall financial development defined by the legal system is what actually matters for growth.

Finance is defined as a set of contracts and these contracts are defined and made effective by legal rights and enforcement mechanisms. A well-functioning legal system facilitates the operation of both markets and intermediaries. Levine (2002), further argues that the quality of financial services as determined by the legal system improves the efficient allocation of resources and economic growth.

This view has been further exploited in the law, institutions, finance and growth literature. However, Allen, Qian and Qian (2004) demonstrate how China is a counter-example to the belief that law, institutions and finance matter for economic growth. Despite its poor legal and financial systems, China has one of the fastest growing economies in the world.

Country-level studies consistently show that less secure property rights mean lower aggregate investment and slower economic growth. Johnson, McMillan and Woodruff (2002), study if in addition to external finance, secure property rights are necessary for entrepreneurs to invest. They use monthly data from survey sources in 1997 from post-communist countries like Poland, Romania, Russia, Slovakia and Ukraine. They find that in countries like Russia and Ukraine, where property rights are least secure, entrepreneurs are reluctant to reinvest their profits. In Poland, on the other hand, property rights are more secure which explain the high rates of reinvestment of retained earnings.

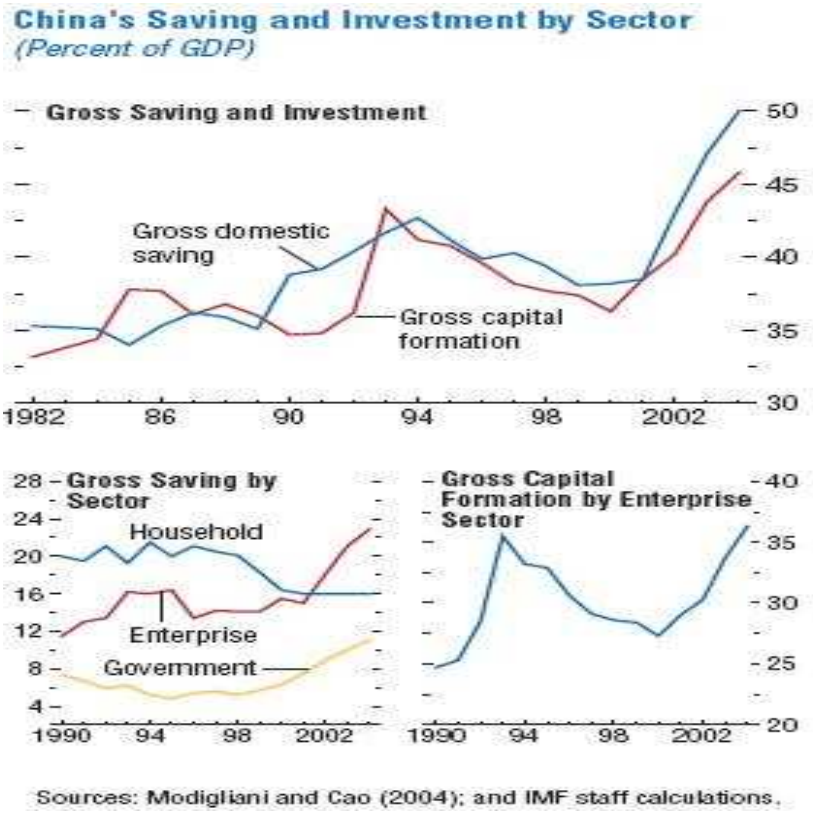
The main sources of finance in China are government grants and bank loans. Other sources of finance include foreign investment, issuing domestic stock or domestic debt, borrowing from other companies, investment by other enterprises and retained funds. Retained funds comprise retained earnings, depreciation, major repair funds and 'other enterprise' retained funds (Cull and Xu, 2005).

"A penny saved may be a penny earned, but in China a penny saved is usually invested in an infrastructure project or an increase in manufacturing capacity." (IMF,2006) . The gross domestic savings rate in China has averaged 40% in the 1990's while recently it has risen to around 50%. Part of this saving has been invested abroad (mainly in US Treasury bonds) thereby funding the US current account deficit and keeping US interest rates low. The majority of this saving has in

fact been invested in the Chinese economy which has increased gross capital formation to around 45% of GDP that has led to a growth rate of around 9.5%.

The following chart taken from the IMF's World Economic Outlook shows that Chinese firms have a high savings rate. This saving is mainly in the form of retained earnings. Additionally, the government is also a net saver. Due to this high savings from the household, government and firms, China has been able to sustain a high rate of investment.

FIGURE 4.1



4.4 FINANCIAL SYSTEM IN CHINA

Pre-reform period, Chinese firms were state-owned and received all financing from government bureaux. The interdependence between state and enterprises created a soft budget constraint for firms. Constraints on state-owned firm spending were not totally binding because the state could readily reallocate funds to cover additional expenditures. The state used its network of administrative bureaux to control resource flows throughout the economy. It could thus redistribute funds from profitable firms to those that were not performing well. China's market-oriented reforms were accelerated after the communist party reached a consensus in 1992 where it decided to

establish a “socialist market economic system” as the main goal of the reform (Lu and Yu, 1998).

4.4.1 THE BANKING SECTOR

In the pre-reform period, all Chinese firms were state-owned and received all financing from government bureaux. All loans to firms were authorized and approved by the State Council. Financial markets were non-existent and banks existed only as state agencies responsible for enacting and enforcing government monetary policy. In the late 1970’s, Deng Xiaoping opened China to the world. Chinese banks have been almost entirely responsible since then to channel the high savings of the people towards productive activities and have therefore played a major role in the high growth achieved by the economy.

In 1978, Chinese policy makers started to implement extensive economic and industrial reforms which included the reform the domestic banking system. In 1978, the People's Bank of China (PBC) was separated from the Ministry of Finance which was a first step towards setting up a free banking system. Furthermore, in 1981 the China Investment Bank (CIB) was established to channel World Bank loans to China.

In 1983, the State Council granted the PBC the authority of a central bank who in turn transferred its commercial operations to four specialized banks: the Agricultural Bank of China (ABC) for the rural sector; the Industrial and Commercial Bank of China (ICBC) for the industrial sector, the People's Construction Bank of China (PCBC) for long-term investment, and the Bank of China (BOC) for foreign exchange. Affiliated with the ABC are rural credit cooperatives whose main lending is to rural households' farming and township-village enterprises

Two additional universal banks were established in 1988: the Bank of Communications (BOCOM) and CITIC Industrial Bank. By 1990, the six banks had vast national networks, with more than 120,000 branches and more than 1.3 million employees. In addition, rural and urban credit cooperatives had 60,000 branches and more than half a million employees (China State Statistical Bureau, 1992).

The PBC still remains an important player. More significantly, major saving sources have been shifted from the government to households and enterprises. A remarkable phenomenon of the years of economic reform is the sustained and rapid increase of household financial savings. China's national savings increased from 30% of GNP in

1980 to around 35% in 1991 and 120% in 1999. The China Construction Bank[45] (CCB) is in fact more valuable than either Barclays, American Express or Deutsche Bank.

The Chinese economy is dominated by bank-based financing, which accounts for more than 75% of all financial assets. The retail banks are the source of most corporate finance, though in practice, although they do not really have any say in the governance procedures of the firm.

The banking sector in China is characterised by a high number of non-performing loans (NPLs). In the mid 1990's although SOEs accounted for 1/3 of GDP, they accounted for 2/3 of total domestic loans (Lu and Yu, 1998). In 2001, NPLs amounted to ¼ of bank assets (Lu, 2006). Until 1994, Chinese banks were obliged to make policy loans (that were granted based on political considerations or other policies). In 2005, the figure of bad debts was estimated to be at around 20-25% of all loans.

As the government decided to develop the banking system what ultimately happened was that the burden of financing unprofitable state-enterprises moved from the state-budget to the state-owned banks. The state intervention in the banking business at various levels adversely affected the autonomy of the SOBs and resulted in low quality loans to unprofitable projects and firms. The government is not the only one to blame for this. It seems that banks simply do not know how to price risk or spot a dodgy borrower (The Economist, 2005)

Until 1994, (State Owned Banks) SOBs were obliged to provide policy loans to (State Owned Enterprises) SOEs. Using its influence on the SOBs, the state pressed them to grant credit and to bail out the SOEs. Due to the fact that China wanted to accede to the WTO[46] to secure its export markets, one of the conditions imposed on China was that it had to open its banking sector to foreign competition. Obviously, this was a serious issue considering the disastrous situation in which the banking sector was. The Chinese government reacted by injecting a huge amount of funds to recapitalise the major SOBs. Since 1998, Beijing has injected more than $260 billion into its banks via straight handouts and by allowing the 4 biggest banks

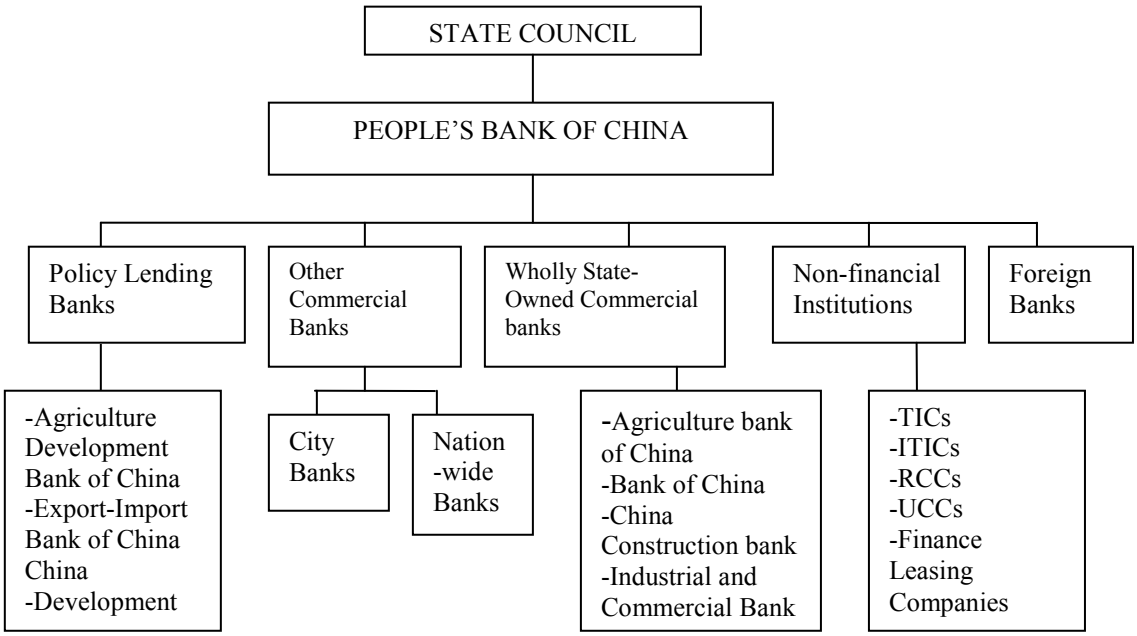
[45] The CCB raised $8 billion from foreign investors for 12% of its shares.
[46] Without WTO membership, for instance, the continuity of China's normal trading relationship with the US was subject to annual reviews by the congress. Hence, China's export trade was vulnerable to the whims of the American domestic politics.

to shift bad loans to separate state-backed companies. Most of the bad loans of the SOBs were written off and debt-for-equity swaps were conducted.

China has benefited from rapid financial deepening. The ratio of savings to GDP increased from 26% in 1985 to 120% in 1999. Domestic credit has increased from 94.7% of GDP to132.7% of GDP in 2000. However, in spite of all this, the Chinese financial system suffers from deep rooted structural problems.

Figure 4.2 below shows the structure of the Chinese financial sector. After the state council, the People's Bank of China is at the head of the banking system and it controls the policy lending banks, commercial banks, state-owned commercial banks, non-financial institutions and foreign banks. These banks in turn control several branches.

Figure 4.2 STRUCTURE OF THE CHINESE FINANCIAL SECTOR



Source: Shirai (2002)

China's financial system is relatively underdeveloped and inefficient. Despite the very high savings rate, financial resources are not channelled effectively towards productive investment. Only the state-owned enterprises find accessing bank finance easy while non-state enterprises cannot access the domestic bank credit and have to rely more on internal finance or the informal credit market.

The Chinese government knows that it has to sort out the banking system to secure the country's future. Currently China needs $5 to produce $1 of output, a ratio far worse than western countries and even India (The Economist, 2005). Investment is at 54% of GDP, higher than the savings rate and this is clearly unsustainable. Positive steps have been taken towards sorting out the banking system. In 2003, the China Banking Regulatory Commission (CBRC) was created that now holds the role of the central regulator. Banks will have to abide by the Basel I regulations by 2007, otherwise they will face sanctions. Most of the commercial banks have introduced better governance, shareholding and incentive structures and have added independent directors to their board (The Economist, 2005).

However, to reform its banks properly, China must allow foreign takeovers and its banks must be allowed to merge and fail- something that the government has been unwilling to do so far. Even if foreign ownership limits are increased, it is unlikely that the government would be willing to give up control of the major banks. Re-organisation of the remainder of the banking system is still needed and would be best accompanied by a growing marketisation of the banking sector. Almost 30% of the banking sector remains to be recapitalized (OECD, 2005).

4.4.2 STOCK MARKET

China began to introduce the shareholding system on a pilot basis in the 1980s as part of its efforts to reform state-owned enterprises. The Shanghai Stock Exchange was founded in 1990 and then the Shenzhen Stock Exchange in 1991. They have been growing very fast since their inception in 1990 but compared to the banking sector, they are still very small. Many state-owned enterprises that had adopted the shareholding system have gone public with some of their shares acquired by private capital. In 2001, the total number of listed companies was 1160. Of the total shares outstanding 46.2% were state-owned shares and 36.6% were tradable shares.

Shares of listed Chinese firms can be broadly classified in two main groups. These are non-tradable shares and tradable shares. There are three main types of shares traded on the 2 exchanges: state shares, legal person shares and other minority shares. These types of shares are discussed in details below.

(i) NON-TRADABLE SHARES

a) State Shares

State shares designate the holdings in the SOEs by the central government, local governments or solely government-owned enterprises. These shares are obtained by the state institutions in exchange of the capital contribution made by the state. State shares are not normally tradeable although they are transferable under the approval of the China Securities Commission (CSRC). SOEs have to issue shares to the state to preserve the socialist structure of the economy and thus state shares represent a quite substantial amount at around 30% of total shares on average (Sun and Tong, 2003).

b) Legal Person Shares

Legal person shares are shares owned by domestic institutions. A legal person share in China is defined as non-individual legal entity or institution. Legal persons are usually business agencies or enterprises of local governments that help to start-up the public company or provide the resources needed towards the start-up expenses of the company. These include stock companies, non-bank financial institutions and SOEs that have at least one non-state owner. Legal person shares are non-tradable but they are transferable to domestic institutions, once again upon approval from the CSRC. According to Sun and Tong (2003), legal persons can be quite effective in monitoring the activities of firms as they are normally large block holders in one or very few companies.

c) Other Minority Shares

A subgroup in this category is employee shares. Employee shares are offered to workers and managers of a PLC, usually at a substantial discount. After a holding period of up to 6 or 12 months, the company may file with the CSRC to allow its employees to sell the shares in the open market. However, the directors, supervisors and the general managers may not transfer such shares during their term time in office. Employee shares account for less than 2% of the total shares and purely as an incentive scheme rather than providing ownership control of any kind.

(ii) TRADABLE SHARES

Around 25% or so stake in the listing firm is sold to individuals and institutions and listed on an exchange. Individual shares can be classified into three categories:

(a) A-shares–shares that are freely traded by mainland individuals

A shares are similar to ordinary equity shares except that they are exclusively available to Chinese citizens and domestic institutions. They are mostly held and traded by individuals. A-shares are required to be at least 25% of total outstanding shares when the company makes its initial public offering.

(b) B-shares-shares traded by foreign individuals and institutions and domestic individuals in China.

B-shares are issued and traded in the two Chinese stock exchanges. B shares are quoted and traded in either US dollars on the SHSE or Hong Kong dollars on the SZSE. B shares can only be subscribed for, owned by, and traded amongst foreigners and people of ethnic Chinese origin (people from Hong Kong, Macau and Taiwan.) In 2001, the B share market was also opened to local Chinese investors who held foreign currency accounts with brokerage firms. On average, foreign shares account for less than 2.5% of the total shares of all companies (Sun and Tong, 2003).

(c) H/N shares-shares listed abroad

China's stock market has been primarily used to provide large state firms undergoing restructuring with capital and new shareholders. Some 90% of the listed firms are former SOEs. [47] When the government embarked on restructuring of its SOEs, by the end of 2002, tens of thousand of SOEs had been incorporated and were operating with board of directors, shareholder meetings and budgetary autonomy from their local government (Deutsche Bank, 2004). The best of these SOEs- 1,200 in total were allowed to issue and list shares publicly.

Sun and Tong (2003) study the performance changes of 634 state-owned (SOEs) listed on the 2 exchanges upon share issuing privatisation (SIP) in the period 1994-1998. An important component of the economic restructuring process is the reform of state-owned enterprises (SOEs). This reform has brought down the SOE

[47] By 2002, only 67 private firms had succeeded in winning a listing in their own right. Even these private firms have to issue non-tradable shares to their founding owners.

share in China's gross domestic product from 77.6% to less than 30% during this period. Share issue privatisation (SIP) in the 1990's became a very important strategy to vitalise the highly inefficient state-owned enterprises. Even then privatisation was only partial, as the state still remained the largest single block holder in most SOEs. There is not even a single SOE that has been completely privatised. The value of the shares held by the government still amounts to around 17% of GDP.

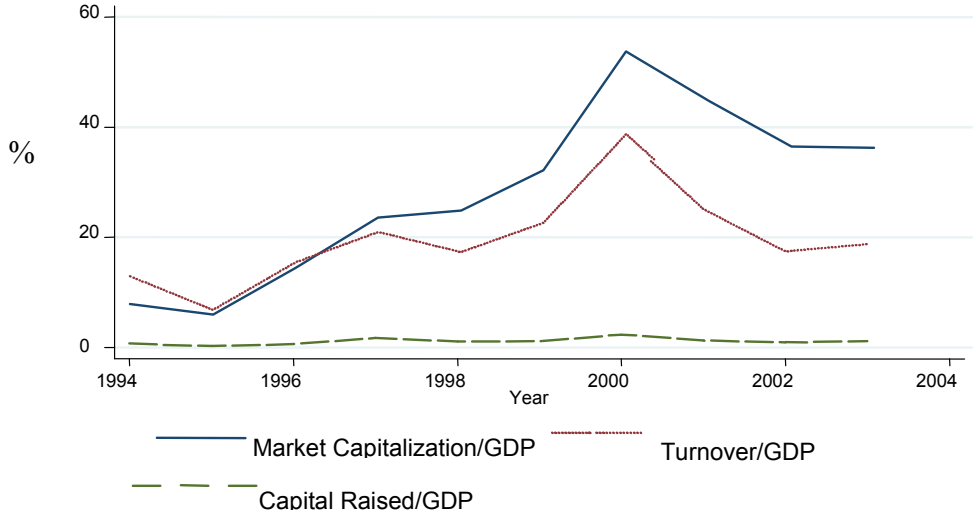
4.4.3 MORE REFORMS ON THE STOCK MARKET FRONT

A number of reforms have been undertaken to free up the financial sector, however, more reforms need to be undertaken to avoid the problem of non-performing loans from arising again. Banks need to be made more efficient, financial markets need to be further developed and deepened that would provide firms with alternative sources of funds and provide households with alternative investment opportunities (Prasad and Rajan, 2006). Interest liberalization and exchange rate flexibility is also an important ingredient in this reform process.

Retail banks are the source of most corporate finance, though in practice, they do not play any role in firm governance especially as banks are not allowed to hold equity in non-financial operations (Deutsche Bank, 2004). Similarly, the stock exchanges are unable to act as a market for corporate control as the bulk of issued shares have restrictive covenants that limit their transfer (OECD, 2005). The government seems to be moving towards the liberalisation of the market as it has decided to ease restrictions on the sale of state-owned shares in quoted companies.

Undoubtedly, the equity market has to be further developed as the market value of freely tradable shares represented just 9% of GDP in 2004. Nearly all the quoted companies are state-controlled (OECD, 2005) while outstanding corporate bonds were equivalent to 1% of GDP in 2003. Moves have been made by the government to remove restrictions on the sale of state-owned shares in quoted companies. The pricing of initial public offers is on a more market driven basis. However, the listing of state-owned enterprises is still determined by the State Council. For quoted state-controlled companies, which earn returns on assets comparable with those of listed companies worldwide, the government has announced that there will be a progressive lifting of the non-transferability of state and local government owned shares, an initiative that could ease mergers and acquisitions (OECD, 2005).

Figure 4.3: STOCK MARKET DEVELOPMENT IN CHINA



Source: China Statistical Yearbook (various issues)

The graph above shows different measures of stock market development in China. The first measure of stock market development that we consider is the Market Capitalisation ratio calculated as the Market capitalisation divided by GDP. The second measure that we use is the Turnover ratio which is the value of shares traded divided by GDP. The third measure is the amount of capital raised on the stock market through stock issues. As can be seen from the graph above, the stock market is relatively under-developed. Market capitalisation and Value Traded are both below 50% of the GDP indicating that the stock market is quite shallow. The peak in 2001 in both Market Capitalisation and Value Traded could be probably be explained by the fact that China joined the WTO in 2001.

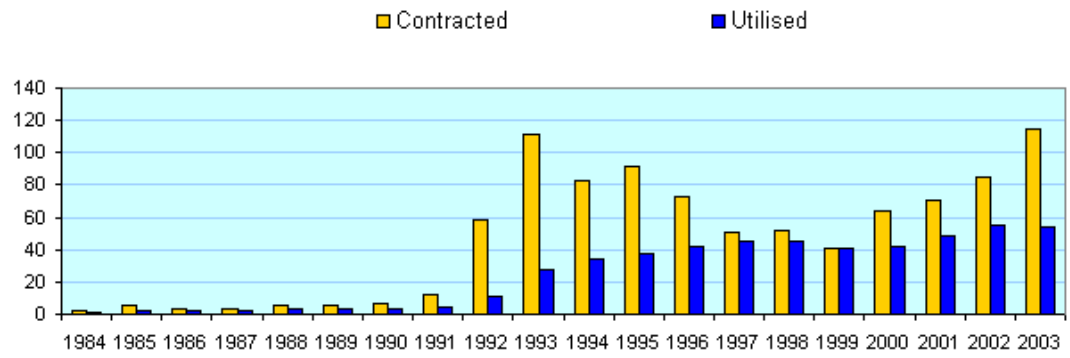
4.5 FOREIGN DIRECT INVESTMENT IN CHINA

During the Mao period (1949-1976), China spurned foreign investment and paid back all its foreign loans (mostly to the Soviet Union) by 1965. After taking over economic policy at the end of 1978, Deng Xiaoping opened up China to foreign trade and investment and in the early 1980s the first Special Economic Zones were set up to absorb direct investment from Hong Kong and elsewhere. In China, foreign equity capital inflows are classified as FDI only if they lead to a foreign equity stake at or

above 25% (Huang, 2003). Thus, the Chinese set a more stringent threshold for FDI and for corporate controls.

China has been the largest recipient of Foreign Direct Investment (FDI) among developing countries in the 1990's. The literature has recognised that there are several important channels through which inward FDI benefits innovation activity in domestic firms in the host country. There are several ways in which FDI is beneficial to the host economy. Local firms learn about products and technologies used by foreign investors. Also, spillovers can arise when workers move from the foreign-owned companies to the domestic owned ones, thereby bringing their knowledge with them. Additionally, domestic firms can be inspired by the foreign firms to develop new products and processes. The diagram below illustrates the amount of FDI entering China. Because not all FDI is actually utilised, we also show the amount of FDI actually utilised.

Figure 4.4 FDI IN CHINA



Source: Ministry of Commerce of the People's Republic of China.

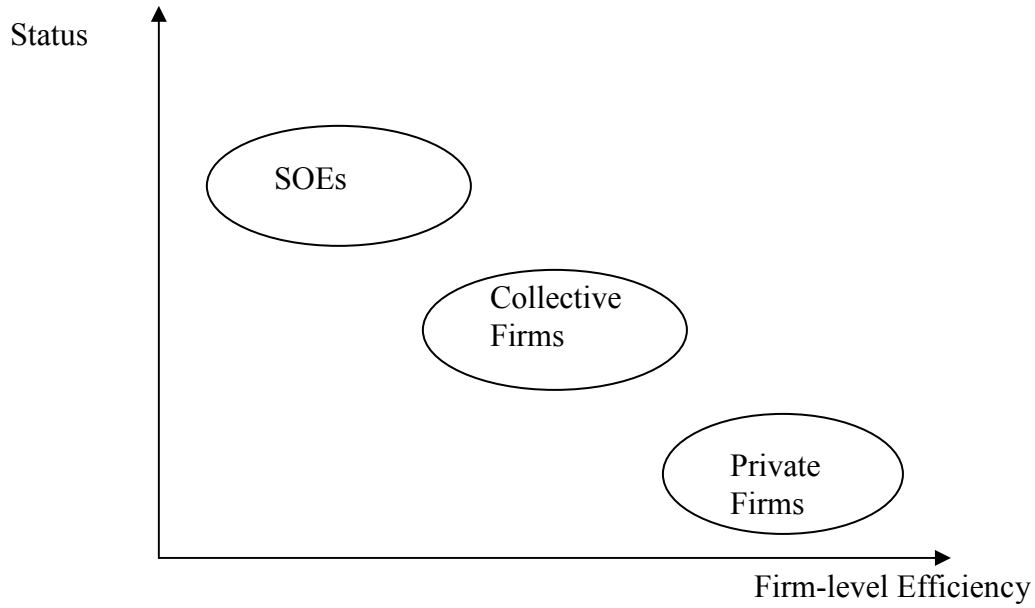
During the 1980s, FDI inflows grew steadily but remained relatively low, confined largely to joint ventures with Chinese state-owned enterprises. After the Beijing Massacre in 1989, western and Japanese companies withheld investment in China, but the momentum was maintained, partly by a new influx of capital from Taiwan. From 1979 to 2001, China absorbed a total of $346.2 billion in FDI. Most of the FDI is a significant source of investment financing in China.

Deng Xiaoping toured Guangdong and Shanghai in early 1992, encouraging a further and much more massive wave of foreign direct investment, increasingly in the form of wholly-owned subsidiaries of foreign companies, which contributed towards acceleration in GDP growth and inflation. In 1997-98, FDI inflows peaked at over US$45bn a year. As China acceded to the World Trade Organisation (WTO) there was another peak in FDI in December 2001, promoting China to top position as an FDI destination in 2003. In the early 1990s, contracted FDI exceeded actually used FDI by a large margin. This gap narrowed in the second half of the decade as the authorities became more realistic in registering inflows (IMF, World Economic Outlook).

However, as proposed by Havrylchyk and Poncet (2006), the large inflow of FDI is not only the consequence of good policies, but also results from certain distortions in the Chinese banking market and in state investment policies. Huang (2003) proposes that FDI resulted as a consequence of institutional imperfections in the Chinese economy. China's domestic and financial institutions have largely favoured SOEs to the detriment of private firms. The latter found getting access to external debt quite difficult and therefore turned to FDI. FDI financed efficient private entrepreneurs and alleviated China's inefficient political pecking order of firms. It provided a privatisation function that would otherwise have been impossible.

Huang (2003) proposes that SOEs are at the top end of the political pecking order. SOEs hence benefit from easier access to bank credit, foreign exchange, business opportunities, political support and legal protection. Therefore, the firms that rely more on FDI are the private firms. Figure 4.5 below illustrates this "Political Pecking Order." Private firms are at the end of the political pecking order as they do not have political connections and therefore they find it very difficult to obtain external finance. However, an alternative view is proposed by Cull and Xu (2005) who find evidence that banks are more likely to lend to profitable private firms despite all the incentive problems that these banks face.

Figure 4.5 Political Pecking Order of Firms



Source: Huang (2003)

4.6 FINANCING DECISIONS OF FIRMS IN CHINA

In this section we provide a survey of studies that have investigated the capital structure decisions of firms in transition economies. The literature in this field is quite sparse as data availability is a serious issue. Consequently not much is known about the financing behaviour of firms in transition economies, especially China.

Booth et al (2001) examine the financial structures of firms in a sample of 10 developing countries to determine if corporate financial decisions vary between developed and developing countries. Developing countries operate in different institutional environment than that of developing countries. Booth et al (2001) use data on 10 developing countries namely India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea. Data is used over the 1980-1990 period from the 100 largest companies in each country where possible. The findings by Booth et al (2001) suggest that variables that explain capital structure of firms in the US and European countries, are also able to explain capital structures in the developing countries mentioned above.

4.6.1 TRANSITION

Keister (2002) proposes that during economic transition, firms must dramatically reduce their financial dependence on the state and begin to borrow from nonstate capital sources. Some basics of firm behaviour indeed apply to firms in China, for instance retained earnings do affect a firm's borrowing. Some studies have found that the informal credit market plays a very significant role in explaining the growth of private firms. According to Chow and Fung (2000), entrepreneurs in China get initial capital mainly from three sources: personal savings, loans from friends or relatives and personal loans from other people. Blanchard (1997) finds that financial institutions in the formal banking system also participate in the underground loan market as the black market interest rates are quite high.

Cull and Xu (2003) investigate the sources of financing of Chinese firms over the 1980-1994 period. The sources of finance include retained earnings, bank finance and government transfers. They also study the relationship between profitability and bank loans. Bank loans have increasingly been used as a substitute for state loans especially as most banks were state-owned and the banks had give out lots of policy loans.

The economic conditions in economies in transition are significantly different from those of more developed market-oriented economies. Finance is very important for firms and western theorists have proposed a number of theories to explain the capital structure of firms. However, these theories might or might not be relevant in the Chinese context. For instance, as proposed by Chow and Fung (2000), internal finance has a more pronounced role to play in determining the level of investment in an economy like China than other developed economies.

4.7 REVIEW OF LITERATURE

According to Chow and Fung (2000), while accessing external finance, small Chinese firms rely more heavily on bank loans than their larger counterparts in any economy in transition. They set out to demonstrate the relationship between firm size and investment financing in the Chinese economy. They focus on small manufacturing firms in Shanghai over the 1989-1992 period. Their empirical results are quite interesting as they suggest that the firms in their sample are actually less liquidity constrained than their larger counterparts in financing their fixed investment. The primary reason for this is the fact that small Chinese firms are the ones that are the

fastest growing, efficient and more successful. These firms that belong to the non-state sectors can rely on the informal credit market although they are excluded from the state banking system.

The International Financial Corporation (IFC) finds that firms in China tend to rely mainly on internal sources of financing. These include retained earnings and principal-owner financing which are used both for start-up capital and subsequent investments. The results obtained by Aziz and Duenwald (2002) suggest that the level of financial development has not played a key role in contributing to growth within China. Rather, bank loans appear to have been channelled to provinces with heavy concentration of state-owned enterprises. Consequently, firms in other provinces had to rely more on retained earnings rather than bank loans. It was these provinces which received fewer bank loans that actually achieved the higher growth rates. Therefore, Aziz and Duenwald (2002) put forward the argument that financial system development might not have played a very significant role in promoting the growth of the Chinese economy.

Keister (2002) uses survey data of 769 formerly state-owned firms over the 1980-1989 period to study the 'financial trajectory' of Chinese firms in the post-reform period. She finds that in the first decade of reform, the higher the retained earnings the larger the sum of funds borrowed externally from all sources. The reason for this is that internal funds like retained earnings were regarded as state assets and managers were restricted in what they could do with the retained earnings.

Managers wanted to gain independence from the state and thus avoided using retained earnings. Instead, they used the existing retained earnings to attract external funding which they could use in any way they wanted. Hence, Keister (2002) proposes that the capital structure of Chinese firms might better be explained by a financial trajectory. Firms which pre-reform period relied entirely on the state started to move to non-state sources of finance, mainly borrowing from banks. Following this, they moved to non-bank sources of finance.

Chen (2003) uses data on 88 listed Chinese companies over the 1995-2000 period. He finds that a major difference between the capital choices of listed Chinese firms as compared to that of firms in developed economies is that listed Chinese firms prefer short-term finance and have substantially lower amounts of long-term debt. This finding suggests that there is a limit to which capital structure theories explain the capital structure of firms in China. Some factors that influence capital structure of

firms in the western world do influence the capital structure of firms in China while the rest are not relevant in the Chinese context.

Chen (2004) also examines whether the Trade-off or Pecking Order Theory might be able to explain the financing choices of Chinese firms. He finds that none of these theories come close to explaining the capital structure of these firms. Instead he proposes that Chinese firms seem to follow a 'new pecking order,' in that firms prefer retained profit then equity and finally debt. The reason why managers prefer equity to debt is that equity is less binding than debt.

Allen, Qian and Qian (2004) demonstrate that China is a significant counterexample to the findings of the existing literature on law, institutions, finance and growth considering the fact that it is one of the fastest growing economies in the world. They study firms that belong to the three different sectors: the state sector, the listed sector (publicly traded firms) and all other firms (privately owned firms). Data used for the listed sector consists of 1100 firms listed on the SHZE and SZSE. For the private sector, the data used is from a survey of 17 entrepreuneurs and executives in the Zhejiang and Jiangsu provinces, 2 of the most developed regions in China.

Allen et al (2004), find that most of the bank credit is issued to firms that belong to the state and listed sectors. However, they find that poor financial and legal framework restricts their growth while private firms grow much faster than these two other sectors. Hence, Allen et al (2004), find that it is likely that there exist alternative financing channels and corporate governance mechanisms that instead of relying on say, the legal framework, rely more on reputation and relationships. The role played by reputation and relationships ensures that these privately held firms have access to finance that in turn explains the higher growth rates as compared to the state or the listed sector.

Guenip (2005) examines the extent to which Chinese banks extend loans to firms on the basis of commercial criteria. Because bank level data is not available, he studies 371 firms listed on the Shenzhen stock exchanges to see what are the factors that affect the amount of leverage used by a firm. By doing this, he is able to infer what factors banks use to give out loans. He finds that growth and size are positively related to the amount of leverage that a firm has. This indicates that firms in China do consider commercial criteria when determining who gets loans. However, he also finds that the amount of collateral used by a firm is not important for loan extension which would indicate that banks do not consider the amount of collateral that a firm

can provide as being important. He explains this by the fact that due to its legal framework collateral is hardly executable in China. Hence, mixed evidence is found about the soundness of loan extension in China.

Kam, Citron and Muradoglu (2005), examine the causes of financial distress in the case of China. They examine a sample of 100 distressed firms listed on the Shanghai and Shenzhen stock exchanges. Firms are classified as financially distressed if they are unable to cover their interest expenses, that is they have a negative interest coverage ratio or they are unable to pay off their debts. They also use the classification scheme used by the exchanges where firms that have negative profits in 2 consecutive years are classified as "special treatment" (ST). They find that prior to distress these firms have high leverage and they significantly reduce their capital expenditure. The existence of soft budget constraints has often been used in the literature as an excuse that Chinese firms operate in a protected environment. However, Kam, Citron and Muradoglu (2005) find that these so-called soft budget constraints do not save these firms as being distressed. Poor firm operating performance is the main cause that they believe causes financial distress.

Huang and Song (2005) use data on 1200 listed Chinese firms over the 1994-2003 period. They try to study if financial leverage decisions made in Chinese-listed firms are different from firms in other economies. They find that similar to other countries, firm size and the asset structure of Chinese firms are positively related to leverage, while there is a negative relationship between leverage and variables like profitability, non-debt tax shields and growth opportunities. Their findings are in essence similar to those of Chen (2003), as they find that Chinese firms seem to have much lower long-term debt as compared to firms in other countries.

All these studies suggest that although the legal and financial system in China is relatively underdeveloped, this has not restricted the access of funds to Chinese firms. Even if most of the bank credit is directed towards state-owned or formerly state-owned firms, privately owned firms have relied mostly on the informal credit market to obtain funds. Regarding the capital structure of Chinese firms, most studies have found that similarities can be drawn between Chinese firms and firms in other developed and developing countries.

In the next chapter, we investigate the various sources of financing of listed Chinese firms. We use good quality financial data and focus on the factors that influence the leverage decisions of firms.

CHAPTER 5

WHAT DETERMINES THE LEVERAGE DECISIONS OF CHINESE FIRMS?

5.0 **INTRODUCTION**

Most research on capital structure and financing decisions of firms has mainly focussed on large firms in western developed countries such as the UK and the US. Two important studies in this area are Rajan and Zingales (1995) (henceforth RZ) and Booth et al (2001). RZ (1995) study the leverage decisions of G7 countries while Booth et al (2001) study the leverage decisions of firms in 10 developing countries[48]. Our study adds to the literature on leverage as we consider the case of China, which is the largest developing and transition economy in the world[49].

Sources of external finance are limited in economies in transition. Firms in these countries are very dependent on financing sources such as bank credit. Obviously, factors that affect the leverage decisions of firms in developed countries might not have the same effect on the leverage decisions of firms in transition economies. Using good quality financial data, we study the leverage decisions of Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges. The stock and bond market in China are still relatively under-developed and a number of restrictions have been imposed on listed firms that do not really allow them to use the stock market as a means of raising finance. Hence most of the listed firms are still very much debt dependent.

The main issue we investigate in this paper is whether the leverage decisions of listed firms in China are significantly different from those made by firms in other parts of the world. Listed manufacturing firms in China have quite low overall leverage at around 22% of assets compared to Anglo-American firms and firms in Continental Europe and Japan (RZ, 1995). The leverage of listed Chinese firms is also quite low even when compared to firms in the sample of developing countries

[48] The G7 countries include United States, Germany, Canada, Italy, France, Japan and the United Kingdom. The sample of developing countries include India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea.

[49] China has one of the highest growth rates in the world and most of this growth is believed to be coming from the manufacturing sector. The manufacturing sector now ranks 4th in the world after the US, Japan and Germany. China has a 50% share of the world-wide camera market, a 30% share for air conditioners, a 25% share for washing machines and a 20% share for refrigerators (People Daily,2002).

used by Booth et al (2001)[50]. However, Chinese firms in our sample seem to use disproportionately more short-term debt than long-term debt, possibly due to the relative under-development of the bond market. Poor property rights and the relatively weak legal system[51] in China possibly explains this behaviour and also suggests that even listed firms that should suffer the least from information asymmetry greatly suffer from it.

This study uses a relatively new database which is the China Stock Market and Accounting Research Database (CSMAR). Using data on listed manufacturing firms, we find that some factors that affect the leverage decisions of firms in the rest of the world (such as profitability and size) also affect the leverage decisions of listed Chinese firms. However, we also find that other factors that influence leverage decisions in other countries (such as collateral and growth opportunities) do not affect the leverage decisions of these firms.

We innovate on existing research by studying whether the leverage decisions of Chinese firms could be affected by China specific variables such as the location of a firm. Moreover in the context of China, we investigate whether regions with different amounts of FDI and the amount of subsidies that firms receive from the state might affect the leverage of firms in our sample. Further, we investigate if WTO accession has had any effect on the leverage decisions of firms. Overall, we find that some firm characteristics such as profitability and size affect the leverage decisions of these firms, while other characteristics such as collateral and growth opportunities do not.

Additionally, we find no important differences in the financing of listed firms across eastern (coastal), central regions and western regions. However, we find evidence that the leverage of firms located in high FDI recipient provinces and who receive more subsidies from the state is not influenced by their profitability. Finally, when we consider whether WTO accession affects the leverage of firms we find no strong evidence to support this claim. However, these results should be interpreted cautiously as we are here focussing solely on the behaviour of listed manufacturing firms which are a tiny sample out of the population of Chinese firms who are likely to be more dynamic than the firms we have considered in our study.

[50] See Table 5.A in Appendix 5.10 for a survey of leverage ratios across a sample of countries.
[51] Although the legal framework in China is quite developed, enforcement mechanisms are poor which makes the legal system inefficient.

The rest of the paper is organised as follows: in section 5.1, we discuss some theoretical considerations and set the background of our research. In section 5.2, we present our data and in section 5.3 we discuss why regional variation might be an important issue. Following this, in section 5.4 we develop six main testable hypotheses. In section 5.5, we consider an empirical specification, following which we present our summary statistics in section 5.6. The regression results are discussed in section 5.7 after which we give attention to the results obtained when we consider regional variation in section 5.8. Section 5.9 concludes.

5.1THEORETICAL CONSIDERATIONS AND RESEARCH BACKGROUND

5.1.1 CAPITAL STRUCTURE THEORIES

If capital markets were perfect, then there would be no difference between internal and external funds (Modigliani and Miller, 1958). However, capital markets are far from perfect. Internal and external finance are not perfect substitutes as asymmetric information creates a wedge between the cost of internal and external funds. Consequently, external funds are more expensive. Reason why, firms spend much time and resources on deciding what source of finance to use as this has important implications for the firm. Recent studies on capital structure decisions of firms have concentrated primarily on contrasting the two main theories of capital structure namely the Trade-off Theory (henceforth TOT) and the Pecking Order Theory (henceforth POT).

According to the TOT, an optimal capital structure is achieved by "trading-off" the costs and benefits of leverage (Berens and Cuny 1995, Fama and French 2002, Shyam-Sunder and Myers 1999). In the trade-off model, companies equate the costs and benefits of leverage and choose a leverage level that optimises the value of the firm. The TOT also assumes the existence of a target leverage level and proposes that there is a positive relationship between leverage and internal funds. Firms that have high internal funds would normally pay high taxes. To avoid this, firms might take leverage in their capital structure to benefit from the interest tax shield that debt provides[52]. This is referred to as a tax shield as it reduces profits of the firm, given that interest has to be paid.

[52] Interest payments are usually tax deductible, and therefore taking debt enables firms to benefit from interest tax shield.

The POT, first proposed by Myers (1984) and Myers and Majluf (1984) prescribes a strict ordering or hierarchy of finance: firms use internal finance first, then debt and only when such options are exhausted, equity finance is used. The POT proposes a negative relationship between leverage and internal funds. If firms follow the financial hierarchy as proposed by the POT then they will only have recourse to debt when there is a shortfall in internal funds. When internal funds increase, firms would reduce the amount of leverage in their capital structure.

In this paper, we do not intend to investigate which theory of capital structure better explains the financial behaviour of Chinese firms, but rather if factors that affect the capital structure of firms in other parts of the world affect the leverage decisions of listed Chinese firms at all. We mainly limit our analysis to studying what determines the overall leverage of listed Chinese manufacturing firms.

5.1.2 **BACKGROUND OF RESEARCH**

RZ (1995) study the leverage decisions of G7 countries during the year 1991. They identify four key independent variables to analyse the determinants of capital structures across the G-7 countries which include profitability, the logarithm of sales that controls for size, tangibility of assets and the market-to-book ratio of the firm. Following in their steps, Booth et al (2001) assess the extent to which capital structure theories are portable across countries with different institutional structures by studying the capital structure choices of firms in 10 developing countries. They provide evidence that these decisions are affected by the same variables as in the developed countries. The factors that affect the capital structure of firms in most countries are profitability, size, growth opportunities, asset structure and tax. They conclude that factors that affect the capital structures of firms in the US and European countries also affect the capital structures of firms in developing countries, although the direction of causality might be different in different countries.

There is a gap in this literature where some aspects of capital structure decisions have not been addressed. This includes the capital structure decisions of firms in transition economies. China is regarded as the largest developing and transition economy in the world. It has one of the highest growth rates worldwide. The literature has recognised that a well developed financial system is necessary for growth; however the Chinese case contradicts this. We believe that by studying the capital structure of Chinese firms we will be able, to a certain extent, to investigate the

financial behaviour of these firms and compare to what extent they are similar to firms in other parts of the world.

Keister (2002) proposes that during economic transition, firms must dramatically reduce their financial dependence on the state and begin to borrow from non-state capital sources. Some basics of firm behaviour indeed apply to firms in China, for instance retained earnings do affect a firm's borrowing as shown in the studies by Chen (2003) and Huang and Song (2005), the two studies that are related to our study.

Chen (2003) uses data on 88 listed Chinese companies over the 1995-2000 period. He finds that a major difference between the capital choices of listed Chinese firms as compared to that of firms in developed economies is that listed Chinese firms prefer short-term finance and have substantially lower amounts of long-term debt. This finding suggests that there is a limit to which capital structure theories explain the capital structure of firms in China. Some factors that influence capital structure of firms in the western world do influence the capital structure of firms in China while the rest are not relevant in the Chinese context.

Huang and Song (2005) use data on 1200 listed Chinese firms over the 1994-2003 period. They study if leverage decisions made in Chinese-listed firms are different from firms in other economies. They find that similar to other countries, firm size and the asset structure of Chinese firms are positively related to leverage, while there is a negative relationship between leverage and variables like profitability, non-debt tax shields and growth opportunities. Their findings are in essence similar to those of Chen (2003), as they find that Chinese firms seem to have much lower long-term debt as compared to firms in other countries.

Another study by Gennip (2005) is indirectly related to the issues examined in this paper. He examines the extent to which Chinese banks extend loans to firms on the basis of commercial criteria. He studies 371 firms listed on the Shenzhen Stock Exchange to see what factors affect the amount of leverage used by Chinese firms. By doing this, he is able to infer what factors banks use to give out loans. He finds that growth and size are positively related to the amount of leverage that a firm has. This indicates that to a certain extent, firms in China do consider commercial criteria while determining who gets loans. However, he also finds that the amount of collateral used by a firm is not important for loan extension which would indicate that banks do not consider the amount of collateral that a firm can provide as being

important. He explains this by the fact that due to its legal framework collateral is hardly executable in China. Hence, mixed evidence is found about the soundness of loan extension in China.

These studies suggest that although the legal and financial system in China is relatively underdeveloped, this has not restricted the access of funds to Chinese firms. Even if most of the bank credit is directed towards state-owned or formerly state-owned firms, privately owned firms have relied mostly on the informal credit market to obtain funds. Regarding the capital structure of Chinese firms, most studies have found that similarities can be drawn between Chinese firms and firms in other developed and developing countries.

In this paper, we mainly examine the factors that affect the leverage decisions of firms in China. This is interesting as property rights are not well- defined and the financial system is not very efficient in China. The bond market is relatively under-developed and while these firms are listed firms they cannot really issue new shares to raise capital. Although these firms are very much dependent on leverage, we expect that Chinese firms would suffer more from (external) financial constraints as they would find it difficult to obtain external funding. Hence, they would probably have less debt in their capital structure. Furthermore, this would directly address the issue if financial system development is important for growth.

Compared to other papers, we study the leverage decisions of firms across regions characterised by differences in FDI and state intervention (measured by subsidies). The Chinese economy is characterised by a high level of state intervention. Most of the firms in our sample started out as State Owned Enterprises (SOEs). Although state intervention has been greatly reduced since China undertook banking reforms in the early 1990s, it is clearly not completely out of the picture. Using the amount of subsidies that firms receive from the state, we study how state intervention in the form of subsidies affects the leverage decisions of firms. We also study leverage decisions across time when we consider WTO accession. All these give a broader picture of leverage decisions of listed Chinese manufacturing firms.

5.2 **DATA**

The paper uses a relatively new database which is the China Stock Market and Accounting Research Database (CSMAR) that is developed and maintained jointly by the Centre for China Financial Research at the University of Hong Kong and the

Shenzhen GTA Information Technology Co. The CSMAR-A Database has collected the data available in all the annual reports of A-share companies listed on the Shanghai and Shenzhen Stock Exchanges since 1990. No other existing financial database on China listed companies is as comprehensive. The data is collected from a number of first- hand sources such as Securities Times, Shanghai Securities daily and China Securities Daily. It contains the financial data (including the balance sheet, statement of profit and profit distribution, statement of changes in financial position, cash flow statement and asset impairment provision statement (since 2001) of all companies listed on both exchanges.

Unlike previous studies, we focus on firms in the manufacturing sector for many reasons. Klapper, Sarria-Allende and Sulla (2002) find that a characteristic common to all transition economies is the concentration of firms in the industrial/manufacturing sector. Moreover, most of the listed firms in China operate in the protected sectors and account for around 40% of the total of listed firms. Manufacturing firms operate mainly in the non-protected sector[53] and therefore financial decisions of these firms are most likely not to be interfered with by the state. In the case of China, most of the growth comes from the manufacturing sector and it will undoubtedly be interesting to study the financing behaviour of these firms.

Between 1978 and 1991, the State tried to improve SOE performance through measures such as reducing government intervention, providing management with greater autonomy and inducing SOEs to operate on a more commercial basis (Shirai, 2002). However, when these measures failed to improve SOE performance, the State decided to reform property rights namely by converting largest SOEs into limited and joint stock companies.

However, this privatisation process did not really take off as listed firms have by and large remained state-owned as the state still owns the majority of shares in these firms. Hence, listed firms in China are quite unique. As documented by Green (2004), 95% of China's 1,278 listed firms in 2003 began their lives as traditional SOEs and many spent only a few months as limited companies before being listed. These SOEs were among the best performing ones in the country and through a listing were allowed to issue and list shares publicly mostly in Shanghai and Shenzhen. However the state has remained in control of most of these firms by retaining the

[53] Firms that operate in the protected sectors include petrochemicals and energy and raw materials.

majority of shares in these firms. Similarly, Allen et al (2004), find that most of the bank credit is issued to firms that belong to the state and listed sectors. Consequently, listed Chinese firms can be said to be under 'disguised' state-ownership, as the state still holds huge amounts of shares in these firms.

5.3 **SAMPLE SEPARATION CRITERIA**

We use four different criteria to separate firms in our sample consisting of listed manufacturing firms. The first two are based on regional variation as we classify firms based on their geographical location and the amount of FDI that the provinces in which they are found receive. The FDI data is obtained from the China Statistical Yearbooks and is provincial level FDI. The third criterion that we use is based on the amount of "help" that firms receive from the state. We use a crude proxy for state intervention by taking into account the amount of subsidies that firms in our sample receive from the state by using firm-level data on subsidies. The fourth one is based on a time dimension where we consider whether joining WTO has had any effect on the leverage decisions of firms.

Recent studies have documented growing regional imbalance in China in terms of labour migration and growth (Xu, 2000). Huang and Song (2005) state that China has huge development gaps in different provinces, autonomous regions and municipalities. Companies head-quartered in different regions might therefore have different levels of leverage. Another study by Liu and Li (2006), find that the use of financial resources also varies across the different regions in China. As far as we know the impact of regional variation on leverage decisions has not been investigated before.

Regional divisions in China can be made using different criteria. A broad geographical grouping is the division between Eastern, Central and Western regions. China consists of different provinces where each province can operate as an independent state. Hence it is quite interesting to study if financing patterns vary across regions. The Eastern region (the coastal provinces) for instance, due to its advantageous geographical positioning attracts much more productive financial resources. Firms in the eastern (coastal) provinces might find it easier to get access to funds while firms located in the central and western provinces might find that lenders are not willing to lend to them because of where they are located. Liu and Li (2006) for instance find that domestic bank loans are important to coastal provinces while

state appropriation and self-raised funds are important to inner provinces. First, we group the firms in our sample in 3 different regions[54] namely the Eastern region, Central region and Western region.

The second geographical grouping that we use is according to the level of FDI that different provinces receive. Unfortunately, we do not have firm level data on FDI so we use a proxy for this. We use provincial level annual FDI obtained from the China Statistical Yearbooks to distinguish among provinces that receive high FDI relative to GDP and those that receive low FDI relative to GDP. We construct a dummy variable that indicates if a particular province in a particular year was a high FDI or low FDI province. Using the percentile methodology, we use a cut-off point of 75%, hence all provinces that are in the bottom 3 quartiles of the distribution of FDI/GDP of all provinces are classified as low FDI while all provinces that are in the top quartile of the distribution of FDI/GDP of all provinces are classified as high FDI. We therefore allow provinces to switch between a high FDI province category to a low FDI province category.

Figure 5.1 in Appendix 5.10 shows the FDI to GDP ratio for firms in the year 1995 across provinces, while Figure 5.2 shows how the use of FDI has evolved over the years and across provinces. It suggests that although the use of FDI has become more widespread (inward movement of FDI to interior of China), the proportion of FDI relative to GDP used has actually fallen. We then merge the dummy variable indicating 'high FDI' or 'low FDI' from the provincial level annual FDI data obtained from the China Statistical Yearbooks with the CSMAR data.

The third criterion that we use is the amount of subsidies that firms receive. Although government intervention is said to have been greatly reduced since China undertook its reforms, there is a subsidy variable in our dataset that suggests that state intervention is not zero[55]. This subsidy variable is described as "various subsidies received by a company such as subsidy for loss due to government policies and refund of value-added tax." When scaled by assets, the amount of subsidies is quite

[54] Eastern region: Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Hainan;
Central region: Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan;
Western region: Inner Mongolia, Guangxi, Sichuan, Chongqing, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Tibet.

[55] China applies a series of measures that allow for refunds, reductions, or exemptions from taxes and other payments owed to the government. These appear designed to subsidize exports of manufactured goods or to support the purchase of domestic over imported equipment and certain other manufacturing inputs.

insignificant; however, when scaled by net profit, the amount of subsidies received is up to 10%.

Using the percentile methodology again, we rank the subsidies/profit received by firms by year and by industry. All firm-years that are in the bottom 3 quartiles of the distribution of subsidy/profit of all firm-years are classified as low subsidy while all firm-years that are in the top quartile of the distribution are classified as high subsidy. We therefore allow firms to switch between being a 'low subsidy' firm-year category to a 'high subsidy' firm-year category. Subsidies could also be an industry specific variable. In particular, some industries could be benefiting from higher subsidies from the state, however as shown in the summary statistics in Table 5.B, Appendix 5.10, there does not seem to be an industry influence on the amount of subsidies received.

Figure 5.3 in Appendix 5.10 shows the evolution of the subsidies variable across the time period considered. The subsidies variable is positive in all years and peaked in 1999 after which it dropped sharply and then rose again. This behaviour could possibly be related to China joining the WTO in 2001. China had to comply with some regulations before joining the WTO and one of them included that it would not provide subsidies to its firms that would thereby allow them to compete unfairly against firms in other parts of the world. However, it is clear from the diagram above that subsidies are still being used. The trend of the subsidies variable scaled by profit exhibits an upward trend until 1999 and drops sharply just before 2001, the year in which China joined the WTO. After 2001, subsidies are on the rise again indicating that even among listed firms state intervention still exists.

The fourth criterion that we use incorporates a time dimension. China joined the WTO in 2001. This has obviously been an important event for China. To investigate if this has had any effect on the leverage decisions of firms, we split our sample into pre-WTO and post-WTO. Pre-WTO group consists of those firm-years preceding 2001, while the post-WTO group consists of those firm-years after and including 2001. By splitting the sample in this way we are able to study if accession to WTO has had any effect on the leverage decisions of Chinese firms. We therefore generate two dummy variables. Pre-WTO is a dummy variable that is equal to one if year is less than 2001 and zero otherwise. Post-WTO is a dummy variable that equals to one if year is greater or equal to 2001 and zero otherwise. This enables us to

examine whether leverage decisions of firms have changed before and after China joined the WTO.

5.4 **TESTABLE HYPOTHESES**

Firms in China operate in a unique financial environment. The country has undertaken extensive economic restructuring since the late 1970s. Many State Owned Enterprises (SOEs) have been privatised and steps have been taken to reform the highly inefficient banking sector and deal with the problems of Non Performing Loans (NPLs) (Lu, 2006). Shirai (2002) finds that Chinese listed firms tend to depend more heavily on debt rather than other sources of finance, for instance equity. However, the firms hardly issue corporate bonds and mostly borrow short-term. Thus, among external sources, they rely more on short-term debt than long-term debt indicating that their maturity mismatch is substantial. Their ratio of equity to total liabilities has hardly changed suggesting that the financing behaviour of these firms has remained quite static. Despite being listed firms, they have not really turned to equity financing as a significant source of financing.

As mentioned earlier, we do not intend to investigate which theory of capital structure better explains the financial behaviour of Chinese firms but rather if factors that affect the capital structure of firms in other parts of the world affect the decisions of listed Chinese firms at all. If despite the extensive reforms undertaken, factors that affect the financing decisions of firms in other parts of the world do not affect the financing decisions of firms in China this implies that the reforms have not been successful. State intervention still exists and firms still benefit from preferential treatment. If the financing decisions of listed Chinese firms are affected by factors like profitability, size, asset structure and growth opportunities, then this implies that reforms in the financial sector have been successful and firms operate in a more competitive environment.

Hence the first hypothesis we test is:

H1: Factors that affect the financing of firms in other parts of the world also affect the financing of listed manufacturing firms in China.

Barclay and Smith (1995) find that firms with higher information asymmetries issue shorter-term debt and also tend to roll over debt. Many studies that have investigated the financing patterns of listed Chinese firms have found that these firms tend to use short-term debt disproportionately more than long-term debt. This leads to

what can be referred to as maturity mismatching as short-term debt is possibly being used to finance long-term investments. The capital structure literature has also found that factors that affect long-term debt are quite different from factors that affect short-term debt. Profitability for instance has been found to be an important factor that influences the amount of short-term debt (but not long-term debt) of firms in many countries (Benito, 2003). Similarly, the amount of collateral that a firm can provide has also been found to be positively related to the amount of long-term debt that firms have as banks are more willing to lend to firms that have more collateral.

Therefore the second hypothesis we test here is:

H2: Listed manufacturing firms in China suffer from maturity mismatching.

The other issue we investigate is whether regional variation matters. China is a very large country and comprises of many provinces. The east coast provinces for instance are more developed and the central provinces are in the middle while the western provinces are less developed. Some provinces behave like small independent states (similar to the US). It is a fact that the western provinces face geographic disadvantages and they also have poor infrastructure. Since the beginning of the reform period in the late 1970's, policy preference has been geared towards the east which has benefited from more international trade and foreign direct investment, the main forces behind the regional disparity. The reason for this can be cheaper labour costs, better infrastructural facilities, close relations with overseas Chinese but most importantly favourable geographic location.

Since listed firms are by nature large and well-known firms (ie they would suffer less from asymmetric information problems), we do not expect the financing patterns of firms to differ much across regions. However, if regional variation is important and firms that are located within a region behave differently from firms in other regions this implies that location plays an important role in financing of firms in China. The third hypothesis we test is:

H3: Regional variation does not matter for listed manufacturing firms in China.

We exploit the geographical elements in our dataset by further investigating the leverage decisions of firms across regions that receive a high level of FDI and a low level of FDI. FDI has been a very important source of financing for Chinese firms since the government allowed FDI to enter the country. Unfortunately we do not have firm level data on FDI and we do not know how much the firms are actually utilizing FDI as a source of finance. To proxy for the use of FDI, we use provincial

level annual data on FDI from the China statistical yearbooks. We match these data with our firm level data so that we know whether our firms are located in high FDI provinces or low FDI provinces. As expected, most of the provinces that receive high FDI are located on the coastal regions (FT, 2005) and include amongst others Beijing, Guangdong, Guangzhou, Fujiang, Hainan, Jiangsu, Shangdong, Shanghai and Tianjin.

Firms that are located into High FDI provinces have an extra source of finance (Huang, 2003) while firms located in Low FDI provinces have to rely only on restricted sources. We hypothesize that the leverage of firms located in High FDI provinces would be less sensitive to their profitability while the leverage decisions of firms that are located in low FDI provinces would be more sensitive to their profitability. There could be several reasons for this. For instance, firms in high FDI provinces might be less debt dependent or by virtue of where they are located, lenders might be more willing to lend to them irrespective of their profitability. Our fourth hypothesis is therefore:

H4: The leverage decisions of firms located in High FDI provinces are not affected by their profitability.

The next hypothesis that we test is whether the amount of subsidies received by firms affect the leverage decisions of firms. We try to include this variable in our regression specification but it is insignificant in most cases. We therefore use the level of subsidies received as an exogenous variable to separate our sample of firms as subsidies could possibly affect the leverage decisions of firms through their effect on profits. We expect that the leverage of firms that receive a high level of subsidies would not be affected by their profitability.

H5: Profitability is irrelevant in the leverage decisions of firms that receive more subsidies.

China joined the WTO in 2001. This has been a major event as acceding to WTO implied that China had now secured its exports markets. Its exports were no longer subject to the vagaries of US politics. Hence, there might have been a pre and post WTO effect on the leverage decisions. For instance, firms might have increased their leverage to meet growing demands after China joined WTO or they could on the other hand have used less debt so that they have spare debt capacity. Either way, we can say that accession to WTO could possibly have an effect on the leverage decisions of Chinese firms in our sample. Therefore the sixth and final hypothesis we test is:

H6: There has been a WTO effect on the leverage decisions of Chinese firms.

5.5 **EMPIRICAL SPECIFICATION**

We use a similar empirical specification as that used by RZ (1995)[56].

$$(Leverage/Assets)_{it} = \lambda_0 + \lambda_1 (Leverage/Assets)_{it-1} + \lambda_2 (Return\ on\ Assets)_{it} + \lambda_3 (Log\ Sales)_{it} + \lambda_4 (Tangible\ assets)_{it} + \lambda_5 (Sales\ Growth)_{it} + v_i + v_t + \varepsilon_{it} \quad (5.2)$$

Return on Assets is proxied by profitability. *Log Sales* is the log of real sales used as a proxy of size. *Tangible assets* is used as a measure of collateral and proxied for by the ratio of net fixed assets to total assets. Unfortunately, the sub-sample of data that we have does not contain the market price of shares and therefore we cannot calculate Tobin's Q as a measure of growth opportunities. We therefore have to rely on a *Sales Growth* measure to capture growth opportunities.

We estimate equation 6.2 using the first-difference Generalised Method of Moments (GMM) estimator, (Arellano and Bond, 1991) which takes into account both firm-specific heterogeneity and potential endogeneity of regressors. Our instrument set includes $(Leverage)_{it-1}$, $(Return\ on\ Assets)_{it}$, $(Log\ Sales)_{it}$, $(Tangible\ assets)_{it}$ and $(Sales\ Growth)_{it}$ which are lagged 2 to 5 times. All observations below or higher than the 1st and 99th percentiles are deleted to avoid problems with outliers.

We use the Sargan test and the m2 to evaluate if our model is correctly specified. The J statistic is the Sargan/Hansen test for overidentifying restrictions. Under the null of instrument validity, the J statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of instruments less the number of parameters. If the model used is correctly specified and the instruments are adequate, the variables in the instrument set should not be correlated with the idiosyncratic component of the error term ε_{it}. On the other hand, the m2 test, which tests for second-order serial correlation, is asymptotically distributed as standard normal under the null of second-order serial correlation[57]. This test provides a further check on the specification of the model and on the validity of variables dated t-2 as instruments.

[56] We try to include a tax variable in our specification as used by Booth et al (2003), however, the coefficient is insignificant in most cases so we drop this variable.

[57] If the p-values for the Sargan and the m2 test are both greater than 0.05, then the instruments are acceptable.

5.6 **SUMMARY STATISTICS**

The summary statistics in column 1 of Table 5.1 give the summary statistics across the full sample. It indicates that listed manufacturing firms in China have overall leverage at around 22% of assets[58]. Similar to the findings of Chen (2004), Huang and Song (2005) and Gennip (2005), we find that most of the leverage of Chinese firms consists of short-term debt while long-term debt is very minimal at less than 5% of assets (see Figure 5.4 in Appendix 5.10). This has 2 possible implications. Either firms are unwilling to borrow long-term or banks are unwilling to lend long-term. The summary statistics further indicate that the listed manufacturing firms we consider here have quite low profitability at around 3% of assets. The financial performance of firms is captured by the Return on Assets (ROA) and Return on Equity variables (ROE). As shown in Figure 5.5 Appendix 5.10, these firms have not been performing quite well.

Next we report the statistics on the regression variables across the 3 regions that we consider in this study. The summary statistics reported in columns *(2), (3)* and *(4)* of Table 5.1 suggest that there are no big differences in the financing patterns and firm characteristics across the regions. Firms in all three regions have similar levels of overall leverage and short-term and long-term debt. There is not much difference in firm size, the amount of collateral that can be provided by the firms or growth opportunities across the regions.

We also report summary statistics of firms located in High FDI and Low FDI regions in columns *(5)* and *(6)* of Table 5.1. Unlike what we would normally expect, firms located in high FDI region and Low FDI region have similar leverage (23% and 21% respectively). We also report summary statistics of firms according to the level of subsidy that they receive which acts as a crude measure of state intervention in columns *(7)* and *(8)*. Firms that receive high level of subsidies have overall leverage of 23% which is higher than the leverage of firms that receive low subsidies at 21% which could possibly indicate that lenders are willing to lend to firms if they receive some form of 'help' from the state.

A noticeable feature worth noting about high subsidy/high state intervention firms is that they have higher growth opportunities. This could reflect the fact that firms that have high growth opportunities receive subsidies from the state because the

[58] See Table 5.A in Appendix 5.10 for a survey of the leverage ratios across developed and developing countries as taken from the studies by RZ (1995) and Booth et al (2001).

state wants to further encourage these firms or it could on the other hand imply that firms which receive more subsidies have more funds and so they have more growth opportunities. We do not find significant changes in firm leverage before or after China joined the WTO in columns *(9)* and *(10)* of Table 5.1. All these suggest that listed Chinese firms have not experienced significant changes in leverage across geographical locations and across time. However, these issues are investigated in further detail using more involved econometric techniques in the next section.

5.7 REGRESSION RESULTS

Table 5.2 presents the regression results for the full sample of firms. Column (1) gives the results using the Ordinary Least Squares (OLS) method. In column (2) we again use the OLS method but we include industry dummies as leverage could potentially be influenced by the industry to which the firm belongs[59]. The results suggest that profitability negatively influences the leverage of listed Chinese manufacturing firms. However, the OLS method ignores both firm-specific heterogeneity and potential endogeneity of regressors.

In column *(3)* of Table 5.2 we use the Within Groups estimator (Fixed Effects) that takes account firm-specific heterogeneity. The results suggest that profitability and size (measured by log of real sales) are the major determinants of leverage of these firms. However, the Within Groups estimator ignores the potential endogeneity of regressors, for example, size affects the profitability of firms and vice versa. We therefore use the Arellano and Bond (1991) Generalised Method of Moments (GMM) estimator in column *(3)* that takes into account both firm specific heterogeneity and potential endogeneity of our regressors.

The benchmark case is that if the coefficient of the lagged dependent variable (0.402) obtained using the GMM estimator lies between the coefficient obtained under the OLS (0.837) and Fixed Effects estimator (0.348), then the first-difference GMM estimator is the best one to use. The results obtained using the first-difference GMM estimator in column *(4)* further indicate that the financial policies of listed Chinese firms are not very different from firms in other parts of the world and give some support to the findings of RZ (1995) and Booth et al (2001). The lagged dependent variable is positive and significant (0.402) indicating that if a firm has high

[59] Note that we cannot include industry dummies in the Fixed Effects and GMM estimations.

leverage at time t-1 then the firm is also likely to have high leverage at time t. From this point onwards we limit our estimation methodology to the GMM estimator.

Like previous studies that have used data on listed firms in China, we find a negative and significant relationship between leverage and profitability of Chinese firms as indicated by the negative and significant coefficient of -0.425, which indicates that Chinese firms do rely on internal finance. As these firms experience an improvement in their profitability, they tend to reduce the amount of leverage in their capital structure. These findings are, to some extent, in accordance to the results obtained by Chen (2004) and Huang and Song (2005) and confirm the finding that Chinese firms tend to follow some form of Pecking Order in their financing, that is they always prefer to use internal finance first, then debt[60].

We find a positive and significant relationship between leverage and the size of the firm (0.023) indicating that leverage increases with size and vice versa. This result could possibly indicate that larger listed Chinese firms get easier access to debt financing. As stated by Green (2004) most of the external finance of firms comes from bank finance as the bond market is relatively under-developed. Tangibility measured by the asset structure (collateral) does not have any effect on the leverage of Chinese firms. This is not surprising as collateral in China is hardly executable and therefore not an important determinant of whether or not a firm can have access to leverage (Gennip, 2005). Another explanation for this could also be the fact that these ex-SOEs have special relationships with banks and therefore collateral is not really important. A third possible explanation could be the fact that since we consider only manufacturing firms they can possibly have assets that are "specialised" and cannot really serve as collateral (see Schaller, 1993 and Guariglia, 2006).

Growth opportunities are insignificant and suggest that they are not important determinants of leverage. One explanation as to why growth opportunities are insignificant could be the fact that the sales growth variable is an imperfect measure. However since we consider manufacturing firms sales would be a good proxy for growth opportunities of these firms. But the sales of these firms have been quite stagnant. This could therefore explain why growth opportunities are not significant. Hence we cannot accept our first hypothesis (*H1*) that factors that affect the financing of firms in other parts of the world also affect the financing of listed manufacturing

[60] It should be noted that in Chen (2004) the pecking order is internal finance, then equity and finally debt.

firms in China, but we cannot reject this hypothesis either. Some factors like profitability and size are significant while other factors like collateral and growth opportunities are not significant.[61]

Next, we examine the debt maturity structure of the firms in our sample as these firms seem to use disproportionately more short-term debt than long-term debt. Prior studies have found that firm characteristics such as size and the amount of collateral are likely to influence the amount of long-term debt that firms use. However, column *(5)* of Table 5.2 shows that none of the firm characteristics except profitability influence the amount of long-term debt that listed manufacturing firms use. Similarly, in column *(6)*, we find that except the profitability and size of the firm, none of the firm characteristics influence the amount of short-term debt in the capital structure of these firms.

We normally expect profitability (internal finance) to have a negative relationship with the amount of short-term debt that a firm uses. Clearly, short-term debt is a substitute for internal finance as shown by the negative coefficient on the profitability variable (-0.317). However, it worth noting that the lagged debt variable is positive and significant both when short-term debt and long-term debt is the explanatory variable indicating that previous period debt strongly determines debt levels in the current period.

As proposed by Barclay and Smith (1995), firms with higher informational asymmetries use debt with shorter maturities. The fact that the financial structure of these Chinese firms is excessively tilted towards short-term debt indicates that these firms suffer from quite serious problems of information asymmetry. The increased use of short-term debt by Chinese firms possibly indicates that lenders are only willing to lend short-term as this allows them to better monitor the firms and reduce misbehaviour (Demirguc-Kunt and Maksimovic, 1999). Obviously this is quite alarming as being listed these firms should be the ones to suffer the least from informational asymmetry problems. However, as proposed by La Porta et al, (2000), when the legal system is inefficient, asymmetric information is more pervasive and problems of moral hazard and adverse selection are more current. On the other hand

[61] To check for the robustness of our results, we use another measure of profitability, that is distributable profit. Distributable profit is profit left after all taxes and payments have been made and what is actually left to distribute to shareholders. The results (not reported), are mostly similar to the results obtained above. Also see Table 5.A in Appendix 5.10 for a comparison with different studies.

this behaviour might reflect the preferred financial strategy of listed Chinese firms in China.

On the supply side, the results above indicate that banks are not very confident about lending to these firms. Obviously, these firms seem quite static as their profitability has remained quite stagnant. The question then arises as to why banks lend to these firms at all. This would obviously be explained by the fact that being ex-SOEs, these listed firms still benefit from some form of special relationship with banks. Hence we accept our second hypothesis (*H2*) that listed manufacturing firms in China suffer from maturity mismatching.

5.8 REGRESSION RESULTS ACROSS VARIOUS GROUPS

The GMM regression results when we consider regional variation are shown in Table 5.3. First, we group our firms in geographical groups: Eastern, Central and Western China and use them as interaction dummies, where they are interacted with all the regressors.

The results that we obtain shown in column *(1)* of Table 5.3, indicate that there is not much difference in the leverage decisions of firms. It is worth noting that the lagged dependent variable is always positive and significant indicating that lagged leverage is an important determinant of leverage decisions. A firm that has high leverage is likely to have high leverage in the next period for Eastern and Central provinces. However, the lagged debt variable for firms located in the western region is insignificant, implying that there is no relationship between debt levels at time t and time t-1 for these firms. They might have high debt in one period and low debt in the next. This peculiar behaviour could possibly indicate that firms in Western region might benefit from special treatment as they are located in the most disadvantageous region in China. In the early 2000s for instance the Chinese government started implementing the Western Development Strategy Plan whose aim was to develop the west.

The profitability variable is negative and significant for all regions. The size, structure and sales growth variables are mostly insignificant across all regions. We test for the statistical differences in the coefficients and find that at least for the lagged debt and profitability variables the coefficients obtained are statistically different from

each other[62]. All the other coefficients on the variables are not really statistically different from each other. For instance, the firms in our sample are all listed firms and do not vary much in size, the amount of collateral that they can offer or their growth opportunities[63]. In column *(2)* of Table 5.3 we use long-term debt as the dependent variable while in column *(3)* we use short-term debt as the dependent variable. Compared to the results in column *(1)*, the results in column *(3)* show that leverage measured by short-term debt is robust to the results obtained previously, when an overall measure of leverage was used as the dependent variable.

To check for the robustness of our results, we perform a series of checks. In column *(4)* of Table 5.3, we use an alternative measure of profit, where we use distributable profit instead of net profit as our profitability measure. In column *(5)*, we use an alternative measure of asset structure that takes into account total fixed assets instead of net fixed assets as our collateral measure. The results indicate that our results are robust and that profitability and size are the main determinants of leverage across listed Chinese manufacturing firms.

Further exploiting regional variation, we consider firms located in regions that receive high FDI and low FDI. In 2004 for instance, China attracted US $60.6 billion in foreign direct investment, but more than ¾ of this investment were channelled into the coastal region (Business Times, 2004), because of this we believe that it would be interesting to split the sample into High FDI and Low FDI regions. However, it should be noted that the amount of shares held by overseas shareholders barely amounts to 2-3% of assets (Shirai, 2002). As explained earlier, due to lack of firm-level FDI data, we use provincial level FDI data. As shown in Figures 5.1 and 5.2 in Appendix 5.10, FDI patterns have changed over time, so a province that was high FDI could switch to being low FDI over time and vice versa. Hence we do not accept or reject our third hypothesis *H3*. Leverage decisions of firms are quite similar across regions except in the western region.

The results when FDI is taken into account are shown in Table 5.4. Once again the lagged dependent variable is positive and significant. The coefficient on the profitability variable although negative is insignificant for firms located in high FDI

[62] The F-statistic obtained when we test for the equality of the coefficients is 13.23 for lagged debt and 5.20 for the profitability variable suggesting that these variables when interacted with region dummies are statistically different from each other.

[63] When the state first listed the firms, the best performing ones from each province were selected to be quoted so it is not surprising that the leverage of firms do not differ much across regions.

province-years suggesting that there is no relationship between leverage and profitability for firms located in high FDI province-years. This would possibly suggest that these firms are less debt dependent by virtue of where they are located or they might be more reliant on FDI than debt[64]. Firms that are located in low FDI province-years exhibit a negative relationship between leverage and profitability, suggesting that these firms behave more like firms in other parts of the world and are likely to be more debt dependent. Other explanatory variables like size, collateral and growth when interacted with the high FDI and low FDI dummies do not really give any significant results. Hence we accept our hypothesis H4 that the leverage decisions of firms located in High FDI provinces are not affected by their profitability.

Next we examine the effect that state intervention has on the leverage decisions of firms using firm-level data on subsidies. As mentioned before we take into account the amount of subsidies that firms receive to proxy for state intervention. The results obtained indicate that for firm-years that receive high subsidy, profitability is not a significant variable that affects the amount of leverage in a firm. There is evidence therefore that firms that receive more subsidies benefit from special treatment as their leverage decisions are not affected by their profitability, while the leverage decisions of firms that receive less subsidies are more dependent on their profitability levels. We therefore accept the hypothesis H5, that there exists state intervention in the form of subsidies and this influences leverage decisions of firms.

The results above indicate that firm-years that are located in high FDI provinces (using provincial level FDI) and receive high subsidies (using firm-level subsidies), that is, experience quite high state intervention do not operate according to firm fundamentals. Therefore this suggests that firm-years located in low FDI provinces and firm-years receiving low subsidies behave more like firms in other parts of the world as their leverage decisions are affected by their profitability.

China joining the WTO in 2001 has been a major event. The country's accession to WTO meant that Chinese firms now had secure export markets and this likely reduced the amount of uncertainty faced by these firms. Therefore, there is a possibility that this has had an effect on the leverage decisions of Chinese firms. However the results obtained in Table 5 indicate that at least on the leverage front,

[64] Unfortunately we do not have firm level FDI so we cannot examine this issue further.

there does not seem to have been a WTO effect on the leverage decisions of listed Chinese firms.

As shown in Table 5.5, the pre-WTO and post-WTO results are not very different. The only significant result is the profitability variable that is negative and significant only after 2001, which possibly indicates that firms are now more likely to be operating according to their economic fundamentals. Pre-WTO firms might be benefiting from soft budget constraints that could explain why profitability is insignificant in their leverage decisions. However, all the other variables such as size, collateral and growth opportunities are insignificant both pre-WTO and post-WTO suggesting that nothing much has changed[65]. Hence we reject hypothesis H6 and conclude that there has not been a strong WTO effect on the leverage decisions of firms.

5.9 **CONCLUSION**

In this paper, we have investigated what affects the leverage decisions of listed manufacturing firms in China. We find that although Chinese listed firms have quite low leverage, most of their debt is short-term, suggesting that maturity matching might be a problem, and that banks prefer to lend short-term, which points towards a risk averse behaviour of the latter. Our results suggest that despite declining profitability, our listed Chinese firms are still able to service debt. This could possibly explain why banks are still willing to lend to them or points towards the fact that despite substantial financial reforms, Chinese firms still benefit from soft budget constraints.

Next, we investigate if financing behaviour differs across regions as markets in China are usually cited as being fragmented. Huge development gaps exist between the Eastern and Western regions and this could possibly affect the financing patterns across regions. We do not find evidence to support this claim, as firms operating in different regions appear to have similar levels of leverage. However, these results should be interpreted cautiously as we are here focussing solely on the behaviour of listed manufacturing firms which are typically large firms and are a tiny sample out of the population of Chinese firms who are likely to be more dynamic than the firms we have considered in our study.

[65] This could also be because WTO accession would only impact export-oriented firms. However, we do not have information about whether our sample of firms export or not.

Next, we explore regional heterogeneity by considering firms located in High and Low FDI recipient provinces. The results we obtain suggest that the leverage decisions of firms located in High FDI provinces are not influenced by their profitability, while profitability is an important determinant of the leverage decisions of firms located in low FDI provinces. We also find evidence suggesting that the level of subsidies obtained influences the leverage decisions of firms. Finally, we explore the time dimension in our dataset by considering whether joining WTO in 2001 has had any effect on the leverage decisions of the firms in our sample. We do not find any significant differences in the financing patterns of firms before or after this event.

In conclusion, our results suggest that the single main determinant of leverage decisions of Chinese firms is the profitability of these firms. Profitability is significant across the full sample and even when the sample is split according to the various geographical attributes. It is also significant when the sample is split in the year 2001. Profitability is only insignificant for high FDI regions and high subsidy firm-years. Unlike other factors such as size or collateral that are significant in only a few cases, profitability is mostly negative and significant, suggesting that Chinese firms do operate according to a pecking order and that their preferred source of finance is internal finance. In this respect, Chinese listed firms are therefore not very different from their western counterparts after all.

5.10 DATA APPENDIX

STRUCTURE OF UNBALANCED PANEL

Number of years of observation	Frequency	Percent	Cumulative
1	73	1.52	1.52
2	88	1.83	3.35
3	153	3.19	6.54
4	400	8.33	14.87
5	700	14.58	29.45
6	558	11.62	41.07
7	651	13.56	54.62
8	536	11.16	65.79
9	468	9.75	75.53
10	240	5	80.53
11	495	10.31	90.84
12	348	7.25	98.08
13	78	1.62	99.71
14	14	0.29	100
Total	4,802	100	

Leverage *(LEV)*
Calculated as the sum of short-term and long-term debt scaled by assets.

Short-term debt *(STD)*
Borrowing with a maturity of less than one year (including one year) and not yet repaid scaled by assets.
Index Number of Data Field: A210101

Long-term Debt *(LTD)*
Debt that the company borrows from banks or other financial institutions, with a maturity of over one year (not including one year) scaled by assets.
Index Number of Data Field: A220101

Net Profit (*PROFITABILITY)*
The net profit realized by a company scaled by assets.
Index Number of Data Field: B150101

Return on Assets *(ROA)*
Calculated as Net Profit/Assets

Revenue from Main Operations *(Sales)*
Log of the real revenues generated by the main operating activities of a company. Sales growth (*Sales Growth*) is calculated as the change in log of real sales using the above measure.
Index Number of Data Field: B110101

Net Fixed Assets (*STRUC*)
Calculated as the difference between Fixed Assets and Accumulated depreciation scaled by assets.
Index Number of Data field: A130127

Fixed Assets: The original cost of a company's various fixed assets, including the cost of fixed assets under finance lease.
Index Number of Data field: A130101

Accumulated Depreciation: The accumulated depreciation of various fixed assets of a company including that of fixed asset acquired under finance lease.
Index Number of Data field: A130113

Subsidies (*SUBSIDY*): Various subsidies received by a company such as subsidy for loss due to government policies, and refund of value-added tax.
Index Number of Data field: B130402

Return on Equity *(ROE),* calculated as distributable profit divided by Shareholder's Equity. Distributable profit is defined as the portion on a company's profit available for distribution. Shareholder's Equity is the total capital invested by shareholders into a company in accordance with the memorandum and articles of the company
Index Number of Data field: B220101
Index Number of Data field: B130402

TABLE 5.1: SUMMARY STATISTICS

	(1) Full Sample	*(2) Eastern Region*	*(3) Central Region*	*(4) Western Region*	*(5) High FDI*	*(6) Low FDI*	*(7) High State Intv.*	*(8) Low State Intv.*	*(9) Pre WTO*	*(10) Post WTO*
No. of observations	*3253*	*1776*	*773*	*688*	*1245*	*2008*	*953*	*2003*	*1488*	*1765*
$(LEV / A)_{it}$	*0.216*	*0.218*	*0.204*	*0.221*	*0.229*	*0.207*	*0.229*	*0.209*	*0.210*	*0.221*
	(0.126)	*(0.129)*	*(0.123)*	*(0.122)*	*(0.131)*	*(0.122)*	*(0.121)*	*(0.128)*	*(0.119)*	*(0.132)*
$(LTD / A)_{it}$	*0.049*	*0.044*	*0.058*	*0.051*	*0.042*	*0.053*	*0.054*	*0.047*	*0.049*	*0.049*
	(0.064)	*(0.060)*	*(0.068)*	*(0.068)*	*(0.060)*	*(0.067)*	*(0.067)*	*(0.063)*	*(0.061)*	*(0.066)*
$(STD / A)_{it}$	*0.167*	*0.174*	*0.146*	*0.171*	*0.186*	*0.154*	*0.175*	*0.163*	*0.160*	*0.172*
	(0.110)	*(0.115)*	*(0.099)*	*(0.107)*	*(0.118)*	*(0.103)*	*(0.107)*	*(0.111)*	*(0.102)*	*(0.117)*
$(PROFIT/A)_{it}$	*0.031*	*0.033*	*0.030*	*0.027*	*0.031*	*0.032*	*0.038*	*0.028*	*0.043*	*0.022*
	(0.052)	*(0.050)*	*(0.054)*	*(0.056)*	*(0.053)*	*(0.052)*	*(0.031)*	*(0.059)*	*(0.049)*	*(0.053)*
$(LNSR)_{it}$	*13.300*	*13.407*	*13.247*	*13.087*	*13.331*	*13.281*	*13.208*	*13.338*	*13.050*	*13.500*
	(1.115)	*(1.187)*	*(0.965)*	*(1.051)*	*(1.213)*	*(1.051)*	*(1.086)*	*(1.124)*	*(1.124)*	*(1.065)*
$(STRUC/A)_{it}$	*0.292*	*0.291*	*0.303*	*0.283*	*0.277*	*0.301*	*0.282*	*0.297*	*0.274*	*0.308*
	(0.128)	*(0.133)*	*(0.119)*	*(0.124)*	*(0.130)*	*(0.126)*	*(0.115)*	*(0.133)*	*(0.119)*	*(0.133)*
$(SalesG)_{it}$	*0.147*	*0149*	*0.121*	*0.173*	*0.141*	*0.151*	*0.182*	*0.134*	*0.229*	*0.103*
	(0.470)	*(0.471)*	*(0.437)*	*(0.501)*	*(0.509)*	*(0.444)*	*(0.461)*	*(0.473)*	*(0.573)*	*(0.397)*
$(Subsidy)_{it}$	*0.076*	*0.084*	*0.057*	*0.079*	*0.078*	*0.076*	*0.235*	*0.010*	*0.073*	*0.079*
	(0.226)	*(0.246)*	*(0.170)*	*(0.228)*	*(0.233)*	*(0.222)*	*(0.362)*	*(0.059)*	*(0.202)*	*(0.244)*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time where t=1995-2004. *(LEV/A)* is the sum of long-term and short-term debt divided by assets. The other measures of leverage are long-term debt over assets *(LTD/A),* short-term debt over assets *(STD/A*). *(PROFIT/A)* is profitability divided by assets*, (LNSR)* is the log of sales and *(STRUC/A)* is the ratio of tangible assets to assets, we use a sales growth measure *(SalesG)* to proxy for growth opportunities. *(Subsidy)* is the subsidies received by the firm scaled by net profit. Column (1) gives the summary statistics for the full sample. Columns (2), (3) and (4) reports the summary statistics according to the regions where the firms are located. Columns (5) and (6) report summary statistics according to the level of FDI received by firms in different regions. Columns (7) and (8) take into account the level of state intervention by accounting for the level of subsidies received by firms. Finally, columns (9) and (10) we take into account firm-years before and after 2001, the year in which China joined the WTO.

TABLE 5.2:REGRESSION RESULTS:FULL SAMPLE

	OLS	*OLS*	*Fixed Effects*	*GMM*	*GMM Dep var LTD*	*GMM Dep Var STD*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
$(LEV/A)_{it-1}$	*0.837****	*0.824****	*0.348****	*0.402****	*0.423****	*0.414****
	(0.012)	*(0.013)*	*(0.023)*	*(0.075)*	*(0.080)*	*(0.075)*
$(PROFIT/A)_{it}$	*-0.285****	*-0.317****	*-0.367****	*-0.425****	*-0.165****	*-0.317****
	(0.039)	*(0.040)*	*(0.043)*	*(0.118)*	*(0.089)*	*(0.131)*
$(LNSR)_{it}$	*-0.002*	*-0.001*	*0.006***	*0.023***	*0.013*	*0.039****
	(0.001)	*(0.001)*	*(0.004)*	*(0.014)*	*(0.017)*	*(0.018)*
$(STRUC/A)_{it}$	*0.015*	*-0.010*	*0.018*	*-0.022*	*-0.060*	*-0.000*
	(0.012)	*(0.012)*	*(0.022)*	*(0.080)*	*(0.057)*	*(0.075)*
$(SalesG)_{it}$	*0.014****	*0.014****	*0.003*	*-0.007*	*-0.003*	*-0.016*
	(0.004)	*(0.004)*	*(0.004)*	*(0.010)*	*(0.010)*	*(0.012)*
R-squared	*0.710*	*0.720*				
Sample size	*2354*	*2354*	*2354*	*1549*	*1549*	*1549*
rho			*0.648*			
J				*0.096*	*0.438*	*0.163*
m2				*0.237*	*0.596*	*0.406*
Industry Dummies	*-*	*yes*	*-*	*-*	*-*	*-*
Time Dummies	*Yes*	*yes*	*yes*	*yes*	*yes*	*yes*

Notes: Columns (1) and (2) reports results using the OLS method. In column (3), we use the Fixed Effects method while in column (4), (5) and (6) we use the First Difference GMM method. We report asymptotic standard errors in parentheses. ρ presents the portion of total error variance accounted for by unobserved heterogeneity. Under the null of no serial correlation ρ, is asymptotically distributed as *N(0, 1)*. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it}$, $(LTD/A)_{it-1}$, $(STD/A)_{it-1}$, $(PROFIT/A)_i$, $(LNSR)_{it}$, $(STRUC/A)_{it}$ and $(SalesG)_{it}$ and all lagged two to five times. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 5.1. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5.3: REGIONAL VARIATION

	1	*2*	*3*	*4*	*5*	*6*
		DEP VAR LTD	*DEP VAR STD*	*ROBUST NESS CHECKS*	*ROBUST NESS CHECKS*	*YEAR> 1999*
$(LEV/A)_{it-1}$*EASTERN	0.411***	0.803***	0.366***	0.524***	0.613***	0.407***
	(0.097)	(0.170)	(0.104)	(0.112)	(0.132)	(0.118)
$(LEV/A)_{it-1}$*CENTRAL	0.573***	0.045	0.587**	0.649***	0.619***	0.507***
	(0.137)	(0.175)	(0.170)	(0.181)	(0.182)	(0.167)
$(LEV/A)_{it-1}$*WESTERN	0.117	0.232	0.143	-0.074	0.128	0.120
	(0.112)	(0.145)	(0.183)	(0.154)	(0.162)	(0.158)
$(PROF/A)_{it}$*EASTERN	-0.345**	-0.078	-0.313**	-0.330***	-0.200	-0.303**
	(0.140)	(0.107)	(0.164)	(0.189)	(0.284)	(0.151)
$(PROF/A_{it}$*CENTRAL	-0.532**	-0.225	-0.381	-0.623	-0.699	-0.528**
	(0.214)	(0.166)	(0.255)	(0.303)	(0.445)	(0.218)
$(PROF/A_{it}$*WESTERN	-0.654*	0.041	-0.688**	-1.044***	-0.828***	-0.691**
	(0.322)	(0.232)	(0.325)	(0.391)	(0.461)	(0.383)
$(LNSR)_{it}$* EASTERN	0.007	0.009	0.039***	0.037***	0.071***	-0.000
	(0.014)	(0.018)	(0.019)	(0.020)	(0.032)	(0.021)
$(LNSR)_{it}$* CENTRAL	0.020	0.003	0.046***	0.050**	0.076	0.063*
	(0.021)	(0.021)	(0.024)	(0.027)	(0.048)	(0.040)
$(LNSR)_{it}$* WESTERN	0.037***	0.013	0.046***	0.066***	0.076***	0.050*
	(0.018)	(0.016)	(0.022)	(0.022)	(0.031)	(0.032)
$(STRUC/A)_{it}$* EASTERN	-0.106	-0.122	-0.109	-0.139	-0.122	-0.045
	(0.103)	(0.092)	(0.127)	(0.135)	(0.262)	(0.130)
$(STRUC/A)_{it}$* CENTRAL	0.071	0.095	0.107	0.201	0.052	0.064
	(0.143)	(0.125)	(0.157)	(0.242)	(0.352)	(0.159)
$(STRUC/A)_{it}$* WESTERN	-0.012	-0.003	0.080	0.168	0.111	-0.062
	(0.115)	(0.114)	(0.135)	(0.179)	(0.233)	(0.116)
$(SalesG)_{it}$ * EASTERN	-0.001	0.001	-0.014	-0.009	-0.010	0.006
	(0.010)	(0.010)	(0.012)	(0.013)	(0.020)	(0.016)
$(SalesG)_{it}$ * CENTRAL	-0.004	-0.002	-0.012	-0.022	-0.021	-0.009**
	(0.017)	(0.016)	(0.018)	(0.021)	(0.030)	(0.028)
$(SalesG)_{it}$ *WESTERN	-0.027	-0.012	-0.021	-0.032**	-0.041***	-0.034
	(0.014)	(0.010)	(0.014)	(0.016)	(0.022)	(0.024)
Sample size	1566	1566	1566	1566	1523	1327
J (Sargan)	0.148	0.613	0.352	0.067	0.073	0.053
m2	0.480	0.574	0.348	0.481	0.588	0.446

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it}$ $(PROFIT/A)_i$,$(LNSR)_{it}$, $(STRUC/A)_{it}$ and all $(SalesG)_{it}$, lagged two to three times and interacted with the region dummies: Eastern, Central and Western. Time dummies are included in all specifications as regressors and instruments. In column (1), we use the total debt measure as the dependent variable. In column (2) we use long-term debt as the dependent variable while in column (3) we use short-term debt as the dependent variable. In columns (4) and (5), we check for the robustness of our results by considering an alternate measure of asset structure and profitability. Finally in column (6), we use data as from the year 2000 as this was the year where accounting reforms were undertaken and the reporting systems of firms were becoming more standardized. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see notes to Tables 5.1 and 5.2.

Table 5.4:FIRST DIFFERENCE GMM ESTIMATORS

	1		*2*
$(LEV/A)_{it-1}$* HIGHFDI	0.467***	$(LEV/A)_{it-1}$* HIGH SUBSIDY	0.529***
	(0.125)		(0.127)
$(LEV/A)_{it-1}$*LOW FDI	0.257***	$(LEV/A)_{it-1}$* LOW SUBSIDY	0.368***
	(0.117)		(0.084)
$(PROF/A)_{it}$ * HIGHFDI	-0.032	$(PROF/A)_{it}$*HIGH SUBSIDY	-0.765
	(0.188)		(0.525)
$(PROF/A)_{it}$*LOW FDI	-0.715***	$(PROF/A)_{it}$*LOW SUBSIDY	-0.606***
	(0.224)		(0.146)
$(LNSR)_{it}$* HIGHFDI	-0.001	$(LNSR)_{it}$* HIGH SUBSIDY	0.051***
	(0.020)		(0.019)
$(LNSR)_{it}$* LOW FDI	0.008	$(LNSR)_{it}$* LOW SUBSIDY	0.059***
	(0.021)		(0.020)
$(STRUC/A)_{it}$* HIGHFDI	-0.266**	$(STRUC/A)_{it}$* HIGH SUBSIDY	0.205**
	(0.041)		(0.155)
$(STRUC/A)_{it}$* LOW FDI	0.180	$(STRUC/A)_{it}$* LOW SUBSIDY	-0.086
	(0.128)		0.092
$SalesG_{it}$ * HIGHFDI	0.021	$SalesG_{it}$ * HIGH SUBSIDY	-0.003
	(0.015)		(0.022)
$SalesG_{it}$ * LOW FDI	0.024	$SalesG_{it}$ * LOW SUBSIDY	-0.032**
	(0.017)		(0.016)
Sample size	1566	Sample size	1549
J	0.536	J	0.215
m2	0.318	m2	0.288

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it}$ $(PROFIT/A)_{i}$,$(LNSR)_{it}$, $(STRUC/A)_{it}$ and $(SalesG)_{it}$ all lagged two to three times and interacted with dummies: High FDI, Low FDI or High Subsidy and Low Subsidy. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 5.2 and 5.3. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5.5:FIRST DIFFERENCE GMM ESTIMATORS	
$(LEV/A)_{it-1}$* PREWTO	0.344***
	(0.084)
$(LEV/A)_{it-1}$* POSTWTO	0.290***
	(0.106)
$(PROF/A)_{it}$ * PREWTO	-0.241
	(0.197)
$(PROF/A)_{it}$*POSTWTO	-0.528***
	(0.162)
$(LNSR)_{it}$* PREWTO	0.011
	(0.021)
$(LNSR)_{it}$* POSTWTO	0.022
	(0.021)
$(STRUC/A)_{it}$* PREWTO	-0.029
	(0.087)
$(STRUC/A)_{it}$* POSTWTO	0.005
	0.101
$SalesG_{it}$ * PREWTO	-0.002
	(0.015)
$SalesG_{it}$ * POSTWTO	0.025
	(0.022)
Sample size	1566
J	0.098
m2	0.220

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(LEV/A)_{it}$ $(PROFIT/A)_{i}$,$(LNSR)_{it}$, $(STRUC/A)_{it}$ and all $(SalesG)_{it}$, lagged two to three times and interacted with dummies: Pre WTO and post WTO. Pre WTO is a time dummy equal to 1 for all years prior to 2001 while post WTO is a dummy equal to 1 for all years after and including 2001 to account for WTO accession. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 5.2 and 5.3. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

TABLE 5.A:CROSS COUNTRY LEVERAGE RATIOS				
	Number of firms	*Time Period*	*Total Debt Ratio*[66]	*Long-term Debt Ratio*
Developed Countries				
United States	*2580*	*1991*	*27*	*37*
Japan	*514*	*1991*	*35*	*53*
Germany	*191*	*1991*	*16*	*38*
France	*225*	*1991*	*25*	*48*
Italy	*118*	*1991*	*27*	*47*
United Kingdom	*608*	*1991*	*18*	*28*
Canada	*318*	*1991*	*32*	*39*
Developing Countries[67]				
Brazil	*49*	*1985-1991*	*30.3*	*9.7*
Mexico	*99*	*1984-1990*	*34.7*	*13.8*
India	*99*	*1980-1990*	*67.1*	*34.0*
South Korea	*93*	*1980-1990*	*73.4*	*49.4*
Jordan	*38*	*1983-1990*	*47.0*	*11.5*
Malaysia	*96*	*1983-1990*	*41.8*	*13.1*
Pakistan	*96*	*1980-1987*	*65.6*	*26.0*
Thailand	*64*	*1983-1990*	*49.4*	*N/A*
Turkey	*45*	*1983-1990*	*59.1*	*24.2*
Zimbabwe	*48*	*1980-1988*	*41.5*	*13.0*
China	***815***	***1995-2004***	***22***	***4.90***

Sources: Rajan and Zingales (1995), Booth et al (2001)

[66] Leverage ratios are calculated as total debt/assets for the G7 countries and for China.
[67] Unfortunately, the leverage ratios for the developing countries are only available as total liabilities divided by total liabilities plus net worth.

TABLE 5.B: SUMMARY STATISTICS ACROSS INDUSTRIES

	Electronics	*Food*	*Machinery*	*Medicine*	*Metal*	*Paper*	*Petrol*	*Textile*	*Wood*	*Other*
No. of observations	*177*	*258*	*901*	*297*	*525*	*104*	*613*	*299*	*10*	*69*
$(LEV / A)_{it}$	*0.203*	*0.191*	*0.193*	*0.214*	*0.290*	*0.233*	*0.233*	*0.217*	*0.191*	*0.226*
	(0.132)	*(0.134)*	*(0.119)*	*(0.117)*	*(0.115)*	*(0.131)*	*(0.131)*	*(0.130)*	*(0.146)*	*(0.139)*
$(LTD / A)_{it}$	*0.042*	*0.030*	*0.034*	*0.0366*	*0.084*	*0.069*	*0.069*	*0.036*	*0.032*	*0.039*
	(0.065)	*(0.048)*	*(0.047)*	*(0.049)*	*(0.085)*	*(0.076)*	*(0.076)*	*(0.050)*	*(0.025)*	*(0.058)*
$(STD / A)_{it}$	*0.161*	*0.160*	*0.159*	*0.177*	*0.205*	*0.163*	*0.163*	*0.181*	*0.159*	*0.186*
	(0.117)	*(0.121)*	*(0.110)*	*(0.109)*	*(0.107)*	*(0.107)*	*(0.107)*	*(0.114)*	*(0.128)*	*(0.130)*
$(PROFIT/A)_{it}$	*0.026*	*0.035*	*0.027*	*0.040*	*0.028*	*0.029*	*0.029*	*0.030*	*0.046*	*0.039*
	(0.055)	*(0.053)*	*(0.060)*	*(0.046)*	*(0.049)*	*(0.050)*	*(0.050)*	*(0.056)*	*(0.042)*	*(0.037)*
$(LNSR)_{it}$	*13.415*	*13.469*	*13.267*	*13.685*	*13.150*	*13.145*	*13.145*	*13.073*	*12.782*	*12.880*
	(1.403)	*(1.031)*	*(1.147)*	*(1.048)*	*(0.833)*	*(0.947)*	*(0.947)*	*(1.055)*	*(0.610)*	*(0.778)*
$(STRUC/A)_{it}$	*0.253*	*0.287*	*0.237*	*0.258*	*0.316*	*0.362*	*0.362*	*0.285*	*0.296*	*0.282*
	(0.128)	*(0.121)*	*(0.095)*	*(0.103)*	*(0.143)*	*(0.130)*	*(0.130)*	*(0.118)*	*(0.076)*	*(0.146)*
$(SalesG)_{it}$	*0.119*	*0.111*	*0.158*	*0.174*	*0.197*	*0.141*	*0.141*	*0.127*	*-0.035*	*0.069*
	(0.496)	*(0.412)*	*(0.489)*	*(0.375)*	*(0.537)*	*(0.477)*	*(0.477)*	*(0.425)*	*(0.589)*	*(0.386)*
$(Subsidy)_{it}$	*0.074*	*0.089*	*0.076*	*0.055*	*0.072*	*0.079*	*0.079*	*0.088*	*0.058*	*0.104*
	(0.235)	*(0.287)*	*(0.235)*	*(0.156)*	*(0.150)*	*(0.213)*	*(0.213)*	*(0.235)*	*(0.074)*	*(0.302)*

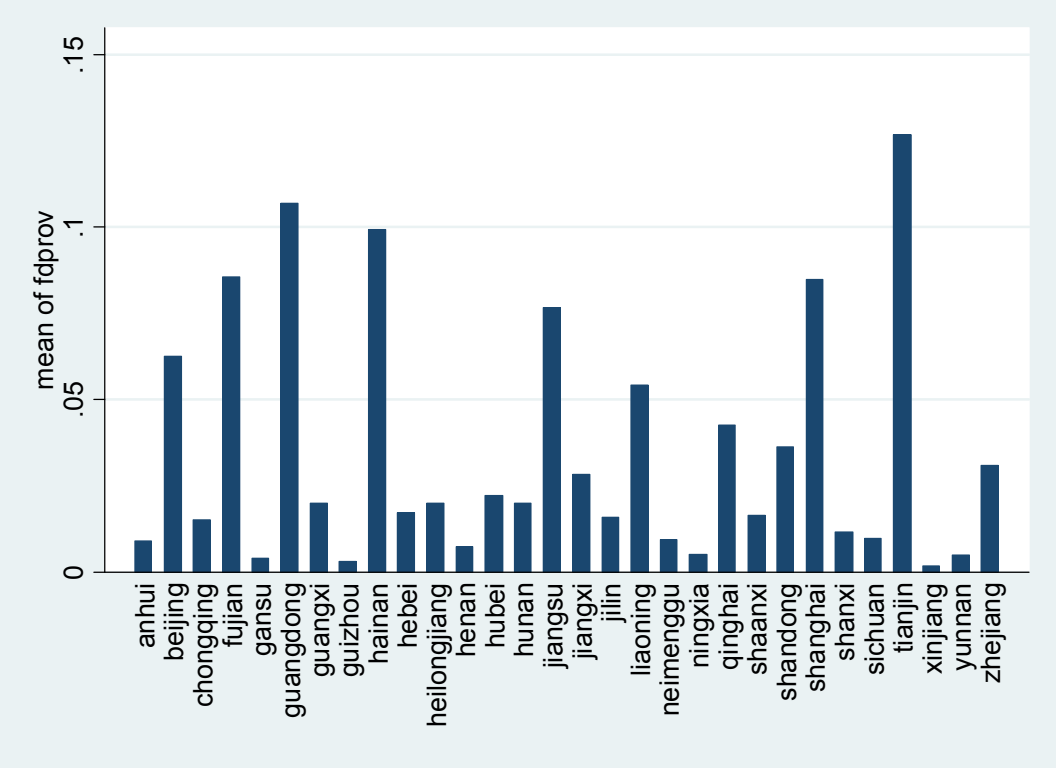
Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time where t=1995-2004. *(LEV/A)* is the sum of long-term and short-term debt divided by assets. The other measures of leverage are long-term debt over assets *(LTD/A),* short-term debt over assets *(STD/A*). *(PROFIT/A)* is profitability divided by assets*, (LNSR)* is the log of sales and *(STRUC/A)* is the ratio of tangible assets to assets, we use a sales growth measure *(SalesG)* to proxy for growth opportunities. *(Subsidy)* is the subsidies received by the firm scaled by net profit.

TABLE 5.C				
	Chen (2003)	Huang and Song (2005)	Gennip (2005)	This study (2006)
Dataset	Dow-China 88 Index 88 firms (1995-2000)	CSMAR	Shenzhen Stock Exchange 371 firms (1993-2003)	CSMAR (Manufacturing only)
Methodology	Pooled OLS Fixed Effects Random Effects	OLS, Tobit	GMM	GMM
Profitability	negative	negative	Negative	negative
Growth	positive	negative	Positive	n.s
Size	n.s	positive	Positive	positive
Asset structure	positive	positive	n.s	n.s
Tax	--	positive	--	--

The table above compares our results with the results obtained in previous studies. We find that overall our results are robust to what has been obtained previously in this literature. From here, we innovate on existing research in many ways by taking account of FDI, subsidies and many other factors.

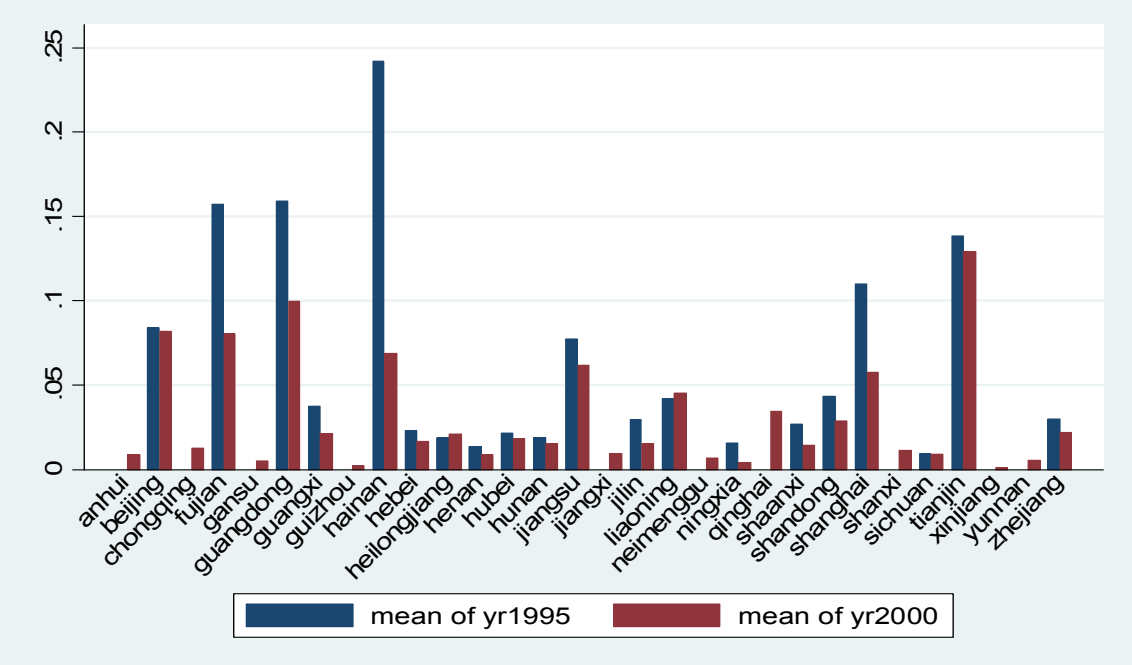
FOREIGN DIRECT INVESTMENT IN CHINA

Figure 5.1



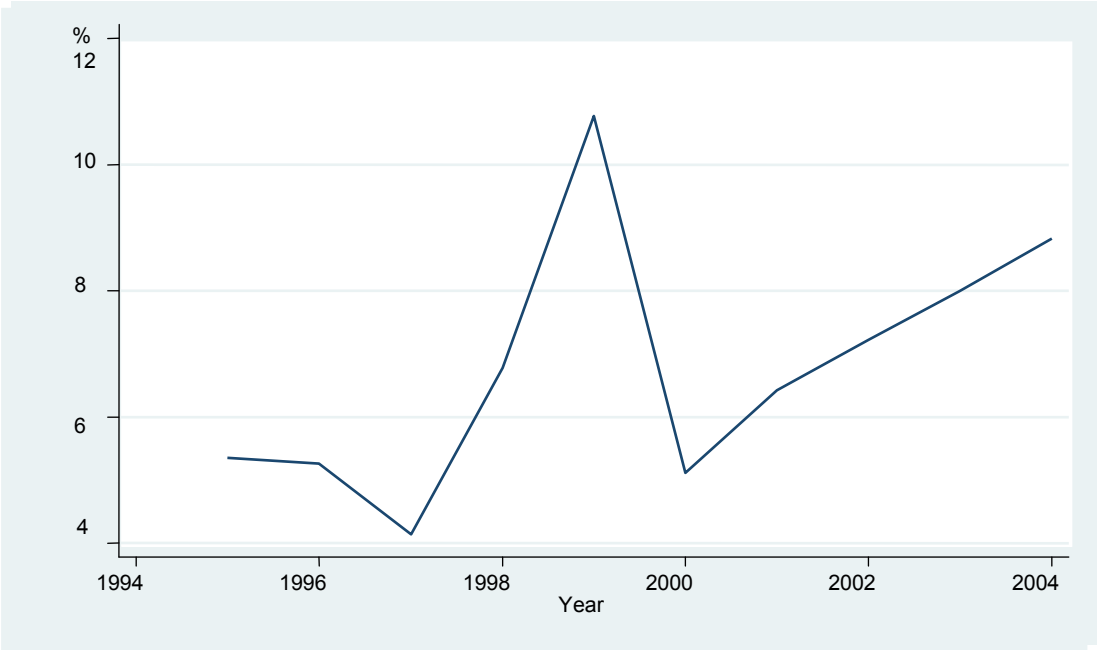
FDPROV: Mean of FDI/GDP for different provinces over 1995-2003

Figure 5.2



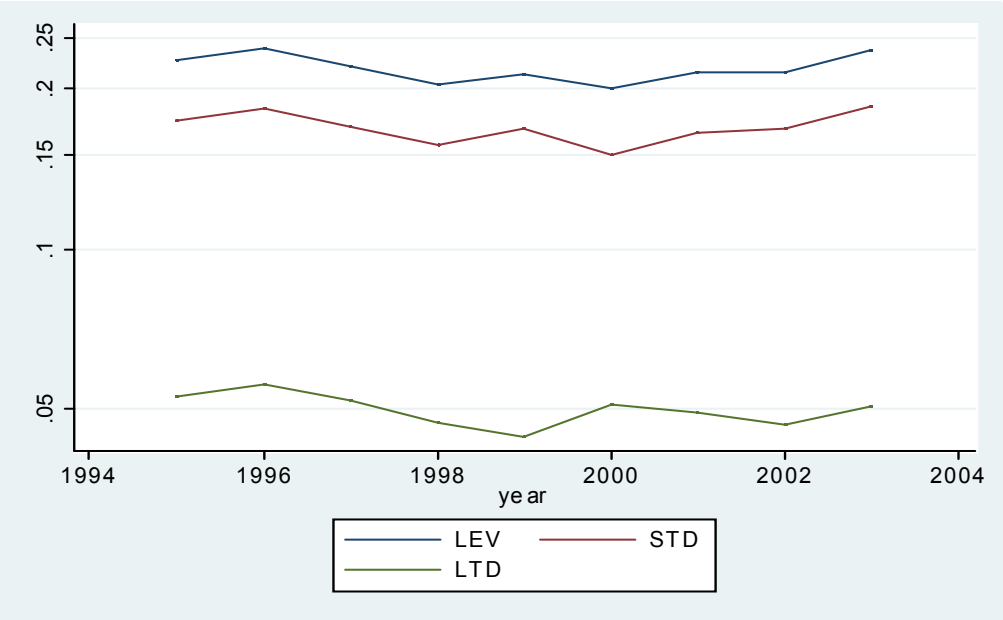
The above diagram shows that provinces that in 1995 did not receive FDI have started receiving FDI in 2000, indicating a movement of FDI towards the interior of China.

Figure 5.3
SUBSIDIES as a % of NET PROFIT



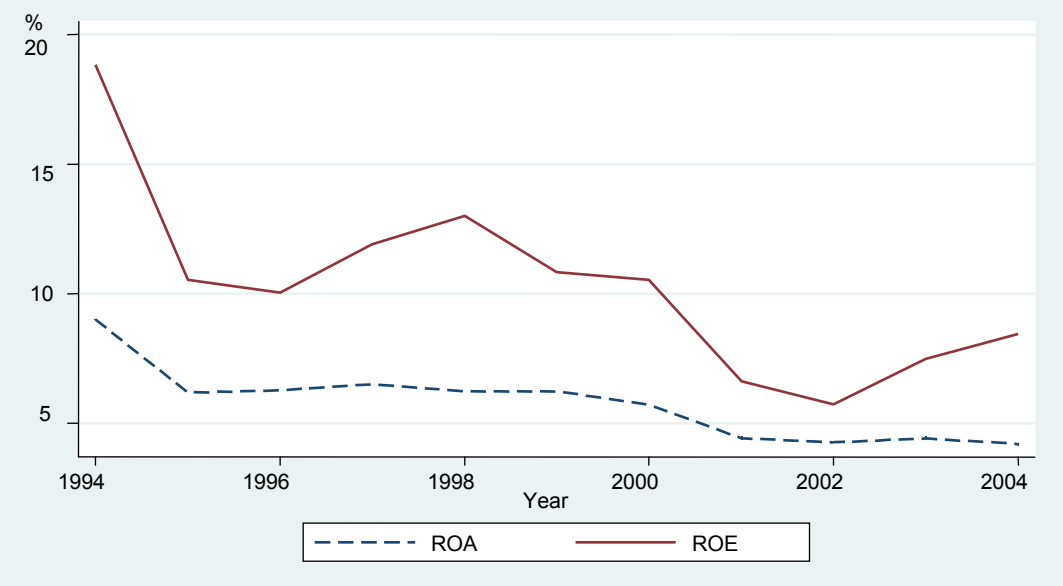
The figure above shows how subsidies scaled by net profit behaved over the period. As can be seen it is positive in all years and peaked in 1999. This behaviour could possibly be related to China joining the WTO in 2001. China had to comply with some regulations before joining the WTO and one of them included that it would not provide subsidies to its firms that would thereby allow them to compete unfairly against firms in other parts of the world. The trend of the subsidies variable scaled by profit exhibits an upward trend until 1999 and drops sharply just before 2000, just before China joined the WTO. After 2001 (once China joined WTO), subsidies are on the rise again indicating that even among listed firms state intervention still exists. It is clear from the diagram above that subsidies are still being used.

Figure 5.4: BEHAVIOUR OF LEVERAGE



The graph above shows that leverage (LEV) of Chinese firms (scaled by assets) consists mainly of short-term debt (STD-debt with a maturity of less than 1 year), while long-term debt (LTD-debt with a maturity of more than 1 year) is quite low.

Figure 5.5: FINANCIAL PERFORMANCE OF CHINESE LISTED FIRMS



The above diagram shows that the Return on Assets (ROA) and Return on Equity (ROE) of firms have been declining over the years suggesting that firms in our sample have not been performing quite well.

Figure 5.6

Source: Fan, 1995.

CHAPTER 6

WHAT DETERMINES THE CASH HOLDING DECISIONS OF CHINESE FIRMS?

6.0 INTRODUCTION

In this chapter we investigate the cash holdings of listed Chinese manufacturing firms. Chinese firms are among the biggest savers in the Chinese economy and it is interesting to study the factors that lead these firms to hold vast amounts of cash. The main motivation of this study comes from Almeida, Campello and Weisbach (2004) (henceforth ACW, 2004). They find that unconstrained US firms hold 8-9% of their total assets in the form of cash and marketable securities, while constrained firms hold around 15% of their assets in liquid form. Chinese listed firms in our sample hold around 19% of their assets in cash over the 1995-2004 period, which possibly suggests that these firms are financially constrained.

In a Financial Times article (2006), Martin Wolf wrote: "the most vexed issue between the two countries (US and China) is the payments "imbalances". Many in the US complain that China is manipulating its currency to preserve excessive competitiveness…it has a huge current account surplus (see Figure 6.1 in Appendix 6.10)…forecast to be at $184 billion in 2006." However, he explains that China's surplus savings cannot really be attributed to the 'frugality' of Chinese households. Indeed, China's household and government sector are net savers but the massive amount of China's savings comes from the corporate sector (see Figure 6.2 in Appendix 6.10). The listed manufacturing firms that we consider also seem to be accumulating vast amounts of cash. However, this is strange as the Chinese firms in our sample are not performing particularly well. China's corporations are generating vast savings and the main issue we investigate in this paper are the reasons for doing so.

As far as we know no other study has investigated the cash policies of Chinese firms. There have been a number of studies based on the US and the UK. Using good quality financial data, we first investigate what are the factors that affect the cash holdings of Chinese firms and then examine the reasons why Chinese firms have

accumulated large reserves of cash. We assume that like debt policies, cash policies might also be determined by a target. For instance, just like firms have an optimal debt ratio, they might similarly have an optimal cash ratio. They might accumulate cash over a certain period of time and use up their cash thereafter. We therefore include a dynamic element in our analysis of cash policies of Chinese firms. Also unlike previous studies that have used OLS or fixed effects, we use the Arellano and Bond (1991) GMM estimator which enables us to take into account firm-specific heterogeneity and the potential endogeneity of explanatory variables.

We next differentiate firms into more or less likely to face financial constraints based on size and profitability. Specifically, we classify firms as *small* and *large* according to the distribution of their real assets and *low profit* and *high profit* according to their level of profitability. Small firms are likely to be informationally opaque, suffer from short track record and are more likely to face financial constraints in their access to external finance. Larger firms on the other hand would be less likely to face financial constraints. Similarly, low profit firms would probably have greater difficulty to get access to external funds while high profit firms would not encounter these problems. We find that cash holding decisions are similar across the two groups of firms.

Acceding to WTO seems to have been a major event in the Chinese calendar. This event could possibly have affected the cash holding behaviour of Chinese firms. We take into account the WTO event by considering firm cash holding behaviour before and after WTO accession. Pre-WTO firms accumulated quite large amounts of cash reserves, which were not linked to any of our control variables. However, post WTO firms seem to be saving out of profits. Overall, the results we obtain suggest that the main variables that affect cash holdings are changes in net working capital (NWC) and changes in leverage indicating that both of these variables are substitutes to cash holdings.

The chapter is organised as follows: In section 6.1 we review the theoretical literature. Section 6.2 reviews the empirical literature while section 6.3 gives the motivation of our study. In section 6.4, we discuss a theoretical framework proposed by ACW (2004) and Han and Qiu (2007). In section 6.5, we formulate a set of testable hypotheses. In section 6.6, we discuss our panel data regression specification in details. In section 6.7, we elaborate on our dataset and discuss our summary

statistics. In section 6.8 we discuss our regression results. Finally, section 6.9 concludes.

6.1 **REVIEW OF LITERATURE**

Earlier studies in the literature have focussed on firms' physical investments and other real expenditures. Studies on capital structure have been based on firms' choices between debt and equity when firms are faced with an internal "financing deficit," whose calculations take cash holdings as exogenous. Capital markets frictions not only affect real variables but more importantly, they affect financial variables. The recent literature has tried to study the impact of constraints on firms' financial policies. In the previous chapters we show that there is a relationship between leverage and cash flow. In this chapter we look at the other side of the coin and study how cash holdings affect the leverage decisions.

Similar to the literature on capital structure, which first started with the assumption of perfect capital markets and later incorporated the idea that capital markets were highly imperfect, the literature on cash holdings too, has followed a similar pattern. If capital markets are perfect, holdings of liquid assets are irrelevant. If a firm experiences a shortfall in liquid assets it can easily raise the required amount at the risk free rate. However, capital markets are imperfect and raising additional funds is costly as the liquidity premium is positive in most cases. Because of this and other reasons discussed below, management likes to hold cash in firms.

Improvements in financial technology have been made and this should mainly reduce holdings of cash. However, the opposite has been observed lately. According to Bates, Kahle and Stulz (2005), US firms have accumulated huge stockpiles of cash and the fall in net debt has been so dramatic that average net debt for these firms has actually been negative. Some examples are firms like Microsoft and Exxon, who have accumulated in excess of $30 billion in cash. The increase in cash holdings have been closely associated with what they call the disappearing "dividends phenomenon".

There are various reasons why management would like to hold on to cash. First managers might be risk averse. They could also hold on to cash to have more flexibility in pursuing their own objectives. Also, managers might want to accumulate cash to avoid making payouts to shareholders and keep funds within the

firm. The question that arises then is why is cash so important? Cash is like free cash flow (Opler, Pinkowitz, Stulz and Williamson, 1998, henceforth OPSW 1998). It allows management to make investments that capital markets might otherwise not be willing to finance.

The following are the main reasons why firms hold cash.

THE TRANSACTION MOTIVE

The transaction motive was first proposed by Baumol (1952) and Miller and Orr (1966). The transaction motive refers to the cost that firms incur when converting a non-cash financial asset into cash and the uses of cash for payments. In the real world, there are costs involved in buying and selling financial and real assets. A firm short of liquid assets has to raise funds in the capital markets, liquidate existing assets, reduce dividends and investment, and renegotiate existing financial contracts or some combination of these actions (OPSW, 1998).

THE PRECAUTIONARY MOTIVE

Firms hold cash to be in a better position to cope with adverse shocks when access to capital markets is costly. The precautionary motive for holding cash is based on the impact of asymmetric information on the ability to raise funds. Even when firms have access to capital markets to raise financing, they may not want to do so at a particular point in time because the securities they are planning to issue are undervalued. In this case, Myers and Majluf (1984) suggest that firms can overcome this problem by building up financial slack, which they define as cash, cash equivalents and unused risk-free borrowing capacity.

THE AGENCY MOTIVE

First proposed by Jensen (1986), the agency motive proposes that entrenched managers would rather hold on to cash when the firm has poor investment opportunities rather than increase the payouts to shareholders. Conflicts of interest might arise between shareholders and managers. Managers may have incentives to hold on to large amounts of cash reserves to pursue their own objectives at the expense of shareholders. They can squander funds by consuming perquisites and/ or making inefficient investment decisions. The reason why managers would want to

hold on to large cash holdings is that they can use the resources when needed instead of having to turn to external finance. External investors can discipline managers by monitoring and therefore preventing managers from doing what they want to do with the funds. To avoid this discipline, managers would like to hold on to large cash reserves.

This agency conflict can be solved through managerial ownership (Ozkan and Ozkan, 2003). Managerial ownership (giving management some fraction of ownership in the firm) can help to align the interests of managers with that of shareholders. When managers own part of the firm, they are less likely to divert resources away from value maximisation as they bear part of the costs of their actions.

TAX MOTIVE

Firms that generate income abroad have incentives to keep that income abroad in order to avoid taxes upon repatriation. Consequently, multinational firms may optimally accumulate cash abroad. The US and many other countries tax the foreign income of their firms, but these taxes can be deferred until earnings are repatriated. As a result, many multinational firms have an incentive to retain earnings abroad and to a large extent these firms hold these funds in cash. Tax incentives can possibly explain why firms might increase foreign cash holdings especially when these holdings are a substitute for domestic cash holdings.

Several factors have been identified in the literature that are believed to affect the level of cash holdings by firms. According to OPSW (1998) a firm's cash holdings would be determined by the marginal benefit and marginal cost of those holdings. Therefore an optimal theory of liquid asset holdings has to address the issue of why it is more efficient for the firm to hold an additional dollar of liquid assets instead of decreasing leverage by some amount or increasing hedging.

Management that maximizes shareholder wealth should set the firm's holdings at a level such that the marginal benefit of cash holdings equals the marginal cost of those holdings. The cost of holding liquid assets include the lower rate of return of these assets because of a liquidity premium and also tax disadvantages. The benefits of holding liquid assets include the fact that the firm saves on transaction costs to raise funds and does not have to liquidate assets to make payments (Transaction Motive). The other benefit is that firms that hold enough liquid assets can use them to

finance its activities and investments if other sources of funding are not available or are excessively costly (Precautionary Motive).

There are two broad explanations for cash holdings which have their root in the capital structure literature. These are the Tradeoff Theory and the Financial Hierarchy Theory.

The Tradeoff Theory

The Tradeoff theory suggests that firms tradeoff the costs and benefits of holding cash to derive optimal cash levels. A value-maximising firm evaluates the marginal cost and marginal benefits of cash holdings to determine the optimal cash ratio.

The Financing Hierarchy Theory

The Financing Hierarchy Theory (OPSW, 1998), proposes the alternative hypothesis that there is no optimal amount of cash. For this to be the case, firms are assumed to be able to issue at low cost to raise cash whenever they experience a shortfall in finance in their financing requirements. The literature on capital structure has recognised that firms might have a target net debt ratio; however, firms might be indifferent whether they have high cash holdings and low debt or low cash holdings and high debt. The financing hierarchy model predicts that firms that have high cash flows would save more cash while firms that invest more would have fewer internal resources and hence would accumulate less cash. Firms that are larger are likely to be successful firms and would hold more cash. Also, firms that pay more dividends should have lower cash.

6.2 REVIEW OF EMPIRICAL LITERATURE

STUDIES BASED ON THE US

Kim, Mauer and Sherman (1998) were the first to empirically examine the determinants of corporate liquidity of US firms. They view cash holdings as investment in liquid assets especially as it reduces firms' dependence on costly external finance. However, this investment in liquid assets is costly as liquid assets earn a low rate of return. Using a panel of 915 US industrial firms during the 1975-1994 period, Kim et al (1998) find that firms tend to have an optimal amount of

liquidity. This liquidity is increasing in the cost of external financing, the variance of future cash flows and the profitability of future investment opportunities. This liquidity is decreasing in the rate of return on current investment opportunities and the size of the firm. Hence, Kim et al (1998) conclude that when faced with asymmetry induced financial constraints firms should stock up on liquid assets to finance future investment opportunities with internal funds.

Opler et al (1998), examine the determinants and implications of cash holdings of cash and marketable securities by listed firms in the US over the 1971-1994 period. They find evidence supportive of the static trade-off model of cash holdings. In particular, firms with strong growth opportunities and riskier cash flows hold relatively high ratios of cash to total non-cash assets. Firms that have the greatest access to the capital market such as large firms and firms with good credit ratings tend to hold less cash. Management tends to accumulate cash if it has the opportunity to do so. Hence, the precautionary motive for holding cash is very strong.

Almeida, Campello and Weisbach (2004) model a firm's demand for liquidity to develop a new test for the effect of financial constraints on corporate policies (the model is studied in more detail in the next chapter). Keynes proposed that the importance of balance sheet liquidity is influenced by the financial constraints faced by firms. Liquidity management is likely to be irrelevant for firms that are unconstrained, that is, who do not face any difficulties in obtaining finance. However, firms that face financing frictions might want to manage their liquidity resources. Firms that expect financing constraints in the future could respond to those constraints by hoarding cash.

Almeida et al (2004) try to investigate this issue by taking into account US firms and classifying them into financially unconstrained and financially constrained firms, using a number of different criteria. They find that while unconstrained firms hold 8-9% of their total assets in the form of cash and marketable securities, constrained firms hold around 15% of their assets in liquid form. They next study the cash flow sensitivities of cash, that is, how cash holdings respond to changes in cash flow at firms facing different degrees of financial constraint. Their results suggest that constrained firms save much more out of their cash flows while unconstrained firms do nothing. They therefore conclude that unconstrained firms have indeterminate cash policies.

Dittmar and Mahrt-Smith (2005) investigate the impact of corporate governance on firm value and particularly examine how managerial entrenchment and lack of shareholder oversight influence both the value and the use of cash resources. Cash holdings represent a large fraction of corporate assets and can easily be spent by management. Governance possibly has an impact on cash policies of firms as indicated by the saying that "left to their own devices, managers will waste corporate resources." Using US data over 1990-2003, Dittmar et al (2005) examine this issue and find that holding large cash reserves is problematic only when firms are poorly governed and/or managers are poorly monitored. Firms that have poor governance are more likely to waste cash resources and thus destroy firm value.

Bates, Kahle and Stulz (2006), examine why US firms hold much more cash than what they used to before. To do this, they use data from the annual industrial files on the WDRS database for the period 1980-2004. Financial firms are excluded because they may carry cash to meet capital requirements rather than for economic reasons. They find that US firms have dramatically increased their average cash ratio between 1980-1994. This increase is concentrated among firms that do not pay regular dividends. The main reason for this increase in cash ratio is that cash flow risk for American firms has increased. They hold much less inventories and capital expenditures and R&D expenditures have increased. Although the derivative market has grown there is still a very important precautionary motive in holding cash for these firms.

Baum, Caglayan, Ozkan and Talavera (2006) investigate the link between the optimal level of non-financial firms' liquids assets and uncertainty. They use a panel of non-financial US firms drawn from the COMPUSTAT quarterly database covering the period 1993-2002. Their results indicate that firms increase their liquidity ratios when the macroeconomic uncertainty or idiosyncratic uncertainty increases. Smaller firms are much more sensitive to both forms of uncertainty and hold much more cash on average than do large firms. Hence they too find evidence in favour of a precautionary motive for holding cash.

Foley, Hartzell, Titman and Twite (2006) examine the issue of why US firms hold so much cash and if this can be explained using a tax-based explanation. They propose that US multinationals could be holding cash in their foreign subsidiaries because of the tax costs associated with repatriating income. They use a sample of US firms over the 1982-2004 period from Compustat and draw data from the Bureau

of Economic Analysis (BEA) annual survey of US Direct Investment Abroad that contain information on domestic and foreign cash holdings. The results obtained suggest that tax incentives increase foreign cash holdings as US firms increasingly see foreign cash holdings as a substitute for domestic cash holdings. Thus repatriation taxes reduce domestic cash holdings.

Harford, Mansi and Maxwell (2006) examine the relationship between corporate governance and firm cash holdings. They study how agency problems affect the propensity to stockpile cash in the US. They find that firms with weak shareholders rights, low insider ownership and higher board independence have smaller cash reserves than those with strong shareholder rights, high ownership and less independent boards. Firms with weaker corporate governance have smaller cash reserves. This could be explained by the fact that firms with poor governance and self interested managers might choose to spend cash quickly rather than gain flexibility through stockpiling it.

STUDIES BASED ON THE UK

Ozkan and Ozkan (2003), investigate the empirical determinants of corporate cash holdings for a sample of UK firms. Using a sample of publicly traded non-financial UK firms over the 1984-1999 period, they find that liquidity exerts a negative influence on cash holdings of firms and the same is true for leverage. The more highly levered a firm, the less cash it will hold. Firms that have more growth opportunities tend to hold more cash. However they do not find evidence that firms with more volatile cash flows hold more cash. Also they do not find any relationship between size and cash holdings.

Ozkan and Ozkan (2003) then focus on how managerial ownership among other corporate governance characteristics might influence the cash holdings of firms. They mainly examine how the board structure and the ultimate controllers of companies influence the cash holdings of firms in the UK. The UK corporate sector is mainly characterised by insufficient external market discipline and the lack of efficient monitoring by financial institutions and company boards. This in turn can provide managers with greater freedom to pursue their own interests that may include holding higher cash balances.

Ozkan and Ozkan (2003) find that managerial ownership plays an important role in determining corporate cash holdings in the UK. They find evidence that the

relationship between managerial ownership and cash holdings is non-monotonic. Cash holdings first decrease with the equity ownership of managers, consistent with the incentive-alignment argument. Companies with managerial ownership between 20% and 30% have the lowest cash holdings. After reaching a minimum, the association between cash and managerial ownership becomes positive providing some support for the entrenchment effect of managerial ownership.

This result is significantly different from the results obtained by OPSW (1998) who find that there is no significant influence of managerial ownership on cash holdings at higher ownership levels, that is, there exists neither alignment nor entrenchment. These results suggest that managerial ownership has different implications in the UK than in the US. It reinforces the impression that the UK corporate sector suffers from lack of external market discipline.

CROSS COUNTRY STUDIES

Dittmar, Mahrt-Smith and Servaes (2003) examine how agency problems namely in the form of shareholder protection rights affect cash holdings of firms. Using data on 11,000 companies in 45 countries, they find that firms in countries where shareholder rights are not well protected hold up to twice as much cash as corporations in countries with good shareholder protection. Shareholders in countries with good protection rights can force managers to dissipate their cash reserves by paying dividends or buying back shares. However, managers in countries with poor protection rights seem to hoard cash possibly because it is easy for managers to use up the cash stocks for their own benefit and reduces the pressure on these managers to 'perform.'

Pinkowitz, Stulz and Williamson (2003) examine if firms in countries with poor protection rights hold more cash. Using a sample of 35 countries and data over the 1988-1999 period, they find that firms in countries with poorer institutions hold more liquid assets (cash) than they would if they were located in the US. They control for GDP per capita, financial development, stock return volatility and inflation among other variables. They find that a firm in a country with the worst institutions has from 5% to 25% more liquid asset holdings in proportion to total assets than a US firm. They conclude that the precautionary motive of holding cash is quite important in explaining why countries with poorer institutions hold more liquid assets.

Chang and Noorbakhsh (2006), examine the impact of globalisation on the cash holdings of firms. The rapid integration of international capital markets has been characterised by an explosion of FDI flows. Chang et al (2006) examine the influence of FDI as an international source of financing in corporate financial decision makings. They introduce the ratio of FDI to GDP in their regressions to capture the effect of globalisation on cash holdings. Using data on 22,000 industries in 48 countries in the year 2000, they find that as the ratio of FDI inflows to GDP increases, firms tend to hold less cash. Hence they conclude that cash holdings and FDI inflows are substitutes. This suggests that inflows of FDI partially substitute for the needed capital that firms traditionally raise in domestic capital markets. They then separate the sample into G7 countries and non-G7 countries. Their findings indicate that FDI inflows seem to act as substitutes for corporate cash holdings in G7 countries while they seem to have a complementary effect in non-G7 countries.

STUDIES BASED ON EUROPEAN COUNTRIES

Pal and Ferrando (2006) examine how financial constraints might influence firms' cash policy in the Euro area. The data they use is on non-financial corporations in the Euro area obtained from the AMADEUS database of Bureau van Dijk. The data covers the 1994-2003 period. They find that growth opportunities captured by sales growth do not affect liquidity demand and various types of investments in tangible, intangible and financial assets are negatively related to cash holdings. Net working capital seems to be a substitute for cash and is negatively related to cash holdings while the cash savings of firms are positively affected by an increase in short-term leverage. Larger firms seem to accumulate larger cash reserves implying that size has a positive influence on cash holdings.

Next, they study if the results change if they separate firms into categories that face various degrees of financial constraints. They distinguish among absolutely constrained, relatively constrained and unconstrained firms. The results they obtain suggest that all firms save cash out of their cash flows in a systematic way since they operate under market imperfections where liquidity is relevant for the intertemporal allocation of capital. What they mean by this is that when firms obtain a loan, they save part of the funds obtained and use it over a certain period of time. Hence fixed costs induce firms to raise external funds infrequently and to use cash holdings as a

buffer. Pal and Ferrando (2006) therefore conclude that regardless of financing constraints, there is an optimal amount of cash holdings.

STUDIES BASED ON JAPAN

An interesting question that arises in this case is that do firms in different institutional context hold different levels of cash? Pinkowitz and Williamson (2001) examine the effect of bank power on cash holdings of firms. Firms in Japan have higher cash holdings than those in the US or Germany. There are possible agency problems associated with a bank centered system that lacks another source of monitoring which is the case in Japan. In the Japanese system, a main bank acts as a monitor and firms are members of large industrial groups (keiretsu) with coordinated cross holdings. Because in Japan banks have close relationships with banks, we would expect that firms would not be required to hold high levels of cash holdings as they can easily have access to bank financing if they experience a shortfall.

Using data on Japanese firms over the period 1974-1995, Pinkowitz and Williamson (2001) find that these firms held quite large amounts of cash. This could be explained by the fact that banks persuaded firms to hold large amounts of cash. As the financial system weakened and firms were no longer accountable to banks, the firms still held on to large amounts of cash for precautionary reasons. Hence the cash holdings of firms did not change much over time but the reasons for holding cash changed over time with the weakening of the financial system.

IMPLICATIONS OF CASH HOLDINGS

US firms seem to have been holding large amounts of cash. We can't help but wonder if these large cash holdings have implications on firm value. To put it more simply, is it the case that these large cash holdings hinder firm performance? Managers tend to destroy value when they spend cash windfalls or large stockpiles of cash. The first study to examine whether shareholders interests are harmed by a policy of retaining large cash reserves is Mikkelson and Partch (2002). They examine whether the persistent large cash reserves of US firms actually hinder the performance of these firms. They study 89 publicly traded US firms that held 25% of their assets in cash and cash equivalents at the end of the years 1986 to 1991. They find that persistent policies of large cash holdings do not harm shareholders interests. High cash holdings of firms support investment and growth. They also find evidence that

high cash firms grow faster, undertake higher levels of investment and have higher ratios of market to book value of assets. Additionally, they do not find evidence that operating performance of firms with persistent large cash reserves suffer from a conservative financial policy.

6.3 MOTIVATION OF STUDY

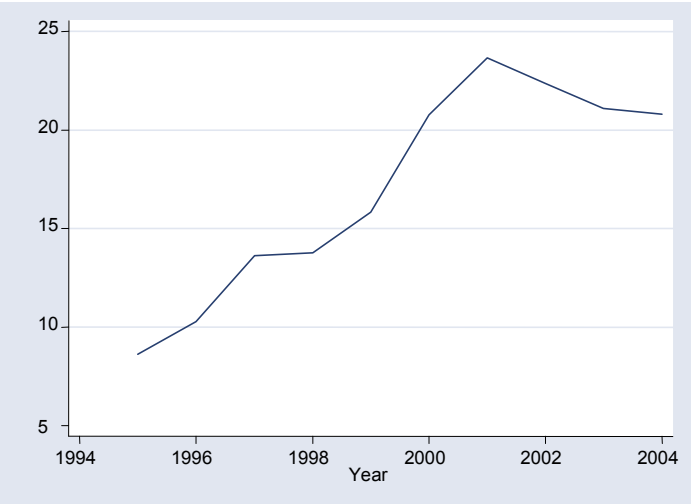
Baum, Caglayan, Ozkan and Talavera (2006) find that firms increase their liquidity ratios when the macroeconomic uncertainty or idiosyncratic uncertainty increases. Smaller firms are much more sensitive to both forms of uncertainty and hold much more cash on average than large firms. Bates, Kahle and Stulz (2006) find that US firms have dramatically increased their average cash holdings over the period 1980-1994. The main reason for this increase in cash holdings is that the cash flow risk for American firms has increased. These firms hold much less inventories but capital expenditures and R&D expenditures have increased. Although the derivative market has grown in the US, these two studies find that there is still a very important precautionary motive in holding cash for these firms. So why do Chinese firms hold cash?

Listed Chinese firms have accumulated quite important amounts of cash since they have been listed. In this chapter, we examine the reasons why they accumulated such large reserves of cash. In the pre-reform period, Chinese firms were state-owned and received all financing from government bureaus. The interdependence between state and enterprises created soft budget constraints for firms. Huang (2003) proposed that SOEs are at the top end of the political pecking order. SOEs hence benefit from easier access to bank credit, foreign exchange, business opportunities, political support and legal protection. Wang and Zhu (2004) state that while public listing in developed countries either turns a privately-held company into a more widely-held public company, public listing in China is largely used to corporatize SOEs. As a consequence of this, the state still holds around 60% of the shares of formerly state owned enterprises that are listed on the Shanghai and Shenzhen Stock Exchanges. Being formerly state-owned enterprises, these firms could possibly still be benefiting from soft budget constraints as explained in Chapter 5.

We examine what has happened to the cash holdings of Chinese firms as from the mid-1990s. The diagram below indicates that the firms in our sample have

accumulated quite large amounts of cash between 1995-2004 and these cash holdings peaked in the year 2000 (the year just before China joined the WTO).

Figure 6.3: Cash Holdings as a percentage of Net Assets

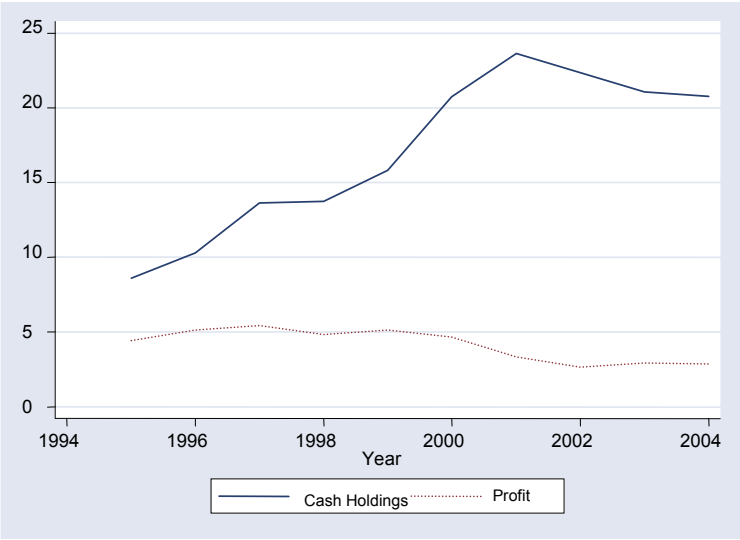


Source: Author's calculations.

An interesting question is why these firms accumulated so much cash? What is the need for these listed companies to accumulate cash if these listed companies face soft budget constraints? They do not really need to do this as being (partially) state-owned they still have a special relationship with banks. If ever they experience a shortfall in cash flow, they can easily obtain the shortfall from state-owned banks.

The Chinese listed firms have not been performing too well. In fact, their financial performance has been deteriorating over the period shown.

Figure 6.4: Relationship between Cash Holdings and Profit



Source: Author's calculations

Despite a deteriorating profitability, as shown in the figure above, these firms have continued to accumulate reserves of cash. This behaviour, we believe could be explained by the WTO agenda. China accepted to join the WTO in 2001 but prior to this it had to satisfy some conditions such as reducing state intervention and opening its banking sector to foreign banks (Lu, 2006). It is clear that once foreign banks entered the Chinese market, domestic banks would face competition from them and would therefore try to improve the portfolio of their borrowers. One way of doing this was to stop lending to unprofitable firms.

Due to the uncertainty that this represented, these firms might have held on to large amounts of cash, and therefore we could say that these large cash holdings were largely for precautionary reasons. From Figure 6.4 it is quite clear that Chinese firms piled on quite important reserves of cash because they were uncertain about what was going to happen post China joining the WTO, especially in terms of their accessibility to loans.

Another feature worth noting is the behaviour of subsidies in Figure 6.5 of Appendix 6.10. The subsidies variable is defined as "various subsidies received by a company such as subsidy for loss due to government policies, and refund of value-added tax." As shown in Figure 6.5, beginning 1998 up till 2000, firms received a dramatic increase in the amount of subsidies from the state. Scaled by assets, these subsidies seem quite minimal; however, when scaled by net profit these subsidies are quite significant. For example in certain years, subsidies have been up to 10% of net profit.

6.4 THEORETICAL MODEL

The model that is described in this section is taken from ACW (2004). This is undoubtedly the first paper that tried to model a firm's cash holdings under financial constraints. ACW (2004) model a firm's demand for liquidity to develop a new test of the effect of financial constraints on corporate policies. Extending the literature on investment-cash flow sensitivity that mainly investigates the effect of financial constraints on the sensitiveness of investment to changes in cash flow, ACW (2004) examine how financial constraints affect the sensitivity of cash to changes in cash flow.

In particular, they try to find how changes in cash holdings respond to changes in cash flow. Their main conclusion is that firms that are financially

constrained save more cash out of their cash flows. These financially constrained firms therefore have positive cash flow sensitivities. On the other hand, unconstrained firms have 'indeterminate' cash flow sensitivity as their cash savings are not systematically related to cash flows. After this, many other studies have attempted to model the cash holdings of firms based on other criteria as discussed in the empirical background section[68]. It should be noted that we do not exactly follow the ACW (2004) model. In fact we make the cash flow a continuous distribution and ignore hedging. Han and Qiu (2007) examine the cash holding decisions of US firms under continuous cash flows and study how changes in the volatility of cash flow affects cash holding decisions.

6.4.1 MODEL OF LIQUIDITY DEMAND

ACW (2004) analyse the corporate demand for liquid assets in an imperfect capital market framework. The firm faces a dynamic problem where it has both present and future investment opportunities. To model financial constraints it is assumed that the firm does not have sufficient internal resources (in this case cash flow) to fund all projects with positive NPV. In many cases firms are restricted in their ability to borrow from external sources, that is, they suffer from external financial constraints as they cannot borrow the amounts that they would have liked to borrow. Therefore to ensure that the firm is able to fund any positive NPV projects that arise, the firm can save cash out of cash flows.

6.4.2 STRUCTURE OF THE MODEL

The model has 3 dates 0, 1 and 2. At time 0, the firm is an ongoing concern whose cash flow from current operations is c_0 . At time 0, the firm has the option to invest in a long-term project that requires I_0 today and pays $G(I_0)$ at time 2. At time 1, the firm expects to have another investment opportunity which requires an investment of I_1 and pays $H(I_1)$ at time 2. The production functions are assumed to have standard properties, that is, they are increasing, concave and continuously differentiable. Since the firm is assumed to be an ongoing concern, it has existing assets that produce a cash flow equal to c_1 at time 1. Cash flow in period 1 is random and follows a

[68] For instance, Han and Qiu (2007) account for the effect of the volatility of cash flow on cash sensitivities.

probability distribution F on $[\underline{c}_1, \bar{c}_1] \subset R_+$. $I_1(c_1)$ is the investment that the firm makes in period 1 that gives cash flow equals to c_1.

The assumptions underlying the model are as follows: the discount factor is 1 and everyone is risk neutral. The cost of investment goods at dates 0 and 1 is 1. Both investments I_0 and I_1 can be liquidated at t=2, generating a payoff equal to $q(I_0+I_1)$ where q is ≤ 1 and I_0 and $I_1 > 0$[69]. The total cash flows from both investments are therefore: $g(I_0) \equiv G(I_0)+qI_0$ and $h(I_1)=H(I_1(c_1))+qI_1(c_1)$.

Cash flow from current operations c_0	Cash flow from current operations c_1	Firm Liquidated
t=0	t=1	t=2
Investment I_0 pays at time 2	Investment I_1 pays at time 2	Payoffs: $G(I_0)$ and $H(I_1)$

ACW (2004) mainly rely on a Hart and Moore (1994) type of framework where only hard/tangible assets can be used as collateral. Therefore, the next assumption, critical towards making the firm financially constrained, is that cash flows $G(I_0)$ and $H(I_1)$ are not verifiable and thus cannot be contracted upon. Hence the firm cannot pledge cash flows as collateral to outside investors but can only borrow against the productive assets using them as collateral. If the firm does not pay back its debt, creditors seize the assets that were used as collateral. The liquidation value of the assets is assumed to be given by $(1-\tau)\, qI$. The parameter $\tau \in (0,1)$ is a function of factors such as the tangibility of a firm's assets and of the legal environment that dictates relations between debtors and creditors. For a high enough τ, firms may pass up positive NPV projects because they experience a lack of external finance. These firms thus become (externally) financially constrained.

In the model above, firms can be financially constrained in two ways. They are internally financially constrained if the size of the cash flows from existing assets is smaller than capital expenditures associated with the new investment opportunities.

[69] The parameter q implies that when an investment is liquidated, the amount obtained is less that the actual value of that investment cost. For the purpose of our analysis we assume that q is liquidation costs. Because these costs have to be paid the actual amount obtained might be less that the value of the investment.

In this case, firms will need to borrow from external sources. However, firms can also be externally financially constrained when they have limitations in their capacity to raise external finance. This can cause them to invest below their first best investment levels. Although the above model is mainly based on collateralized debt being the main source of external finance, ACW (2004) state that its intuition is unchanged even if uncollateralized debt or equity issues are the main sources of external finance. The only requirement is that constrained firms have to pay a premium over and above the fair cost of uncollateralized debt and/or equity. Imperfection and therefore illiquidity is captured by τ.

6.4.3 ANALYSIS

In the ACW (2004) model, there are no new investment opportunities to fund at time 2. The firm is only concerned about whether or not to store cash from time 0 until time 1. The firm's objective is to maximise investment. Let *t* denote the time period where *t* can be 0 1 or 2. *d* denotes dividends, *B* represent borrowing amounts, *I* stands for investment, and *C* denotes the amount of cash the firm chooses to carry forward. τ and q are as defined previously. This problem of the firm is to find optimal investment, leverage and cash holding policies, that is finding $B_0^*, B_1^*, I_0^*, I_1^*, C^*$ that maximise the expected NPV of the investment projects. This is shown below.

$$\max_{I} \ (g(I_0) - I_0 + \mathrm{E}[h(I_1(c_1)) - I_1(c_1) | F] \qquad (6.1)$$

subject to the following constraints:

$$d_0 = c_0 + B_0 - I_0 - C \geq 0 \qquad (6.2)$$

$$d_1 = c_1 + B_1(c_1) - I_1(c_1) + C \geq 0 \qquad (6.3)$$

$$d_2 = g(I_0) + h(I_1(c_1)) - B_0 - B_1(c_1) \qquad (6.4)$$

$$B_0 \leq (1-\tau) q I_0 \qquad (6.5)$$

$$B_1(c_1) \leq (1-\tau) q I_1(c_1) \qquad (6.6)$$

In the first equation, the firm maximises investment given the net returns of project G and the expected net returns from project H, subject to the constraints given by equations *6.2-6.6*. The first two constraints restrict dividends (d) to be non-negative in times 0 and 1. Equation *6.2* for instance shows that dividends paid at time 0 is

equal to the cash flows generated by existing assets in place plus the amount the firm needs to borrow (B_0) to be able to invest amount I_0, minus any cash savings (C_0) that the firm carries forward to period 1. The dividend paid in period 1 given by equation *6.3*, is equal to the cash flow generated by the investment plus any amount borrowed minus the amount invested plus the cash flow saved from the previous period used to overcome the shortfall in cash in period 1.

The dividend constraint for period 2 given by equation *6.4* suggests that dividends in period 2 will be equal to what is obtained after liquidating both investments and repaying all the debt. Therefore, terms B_0 and B_1 are the borrowing amounts, which have to be lower than the collateral value generated by the new investments. Debt obligations are repaid at the time when the assets they help to finance generate cash flows. ACW (2004) also take into account hedging by firms. However, we ignore this so as to keep the model simpler. Another reason for this is that the futures market is likely to be quite underdeveloped in China and it might not be very important to control for hedging.

The firm is financially unconstrained if it is able to invest at the first-best level at times 0 and 1, which are defined as

$$g'(I_0^*) = 1 \qquad (6.7)$$

$$h'(I_1^*(c_1)) = 1 \qquad (6.8)$$

For the firm to be financially unconstrained, its investment policy needs to satisfy all the dividend and borrowing constraints stated previously $(B_0, B_1(c_1), C)$. The condition for the firm to be unconstrained is that there exists a financial policy such that

$$I_0^{FB} \le c_0 + B_0 - C \qquad (6.9)$$

$$I_1^{FB} \le c_1 + B_1(c_1) + C \qquad (6.10)$$

for amounts B_0 and $B_1(c_1)$ that are less than or equal to the collateral value created by the first-best investments.

The exogenous parameters that determine whether a firm is unconstrained are the cash flows from existing assets, the liquidity of a firm's assets and the first-best investment levels. In the ACW (2004) model firms can be unconstrained in two different circumstances. First, having sufficient internal funds, that is, having high enough c_0 and c_1 relative to the sizes of their fist-best level of investment. These firms can be regarded as being "internally" financially unconstrained. Second, having high capacity for external finance, that is, having low τ, these firms can be regarded as being "externally" financially unconstrained.

If the constraints above are not binding, this implies that unconstrained firms have indeterminate cash policies. For instance, if a firm *j* is financially unconstrained, it can replace its financial policy $((B_{0j}, B_{1j}(c_1), C_j)$ with an entirely different financial policy $(\hat{B}_{0j}, \hat{B}_{1j}(c_1), \hat{C}_j)$, with no implications on its value. Hence, an unconstrained firm has no unique optimal cash policy. It can either save excess cash or pay it out in dividends; (ACW (2004), pp 1783). Therefore, there is no systematic relationship between cash holdings and increases in cash flow. Han and Qiu (2007) suggest that this result is in essence similar to what Modigliani and Miller (1958) proposed, that is, when capital markets are perfect, financing decisions are irrelevant. Similarly for unconstrained firms, cash policies are irrelevant and changes in volatility of cash flow would have no effect on the cash holdings of firms.

A firm is financially constrained if its investment policy is distorted from its first-best level because of borrowing constraints. A constrained firm cannot undertake all positive NPV projects. This entails a trade-off. Holding cash entails a cost in terms of forgoing today's investment while the benefit of holding cash is the increase in the firm's ability to finance future investment projects. As suggested by ACW (2004), forgoing a dividend payment in periods 0 and 1 is a zero NPV project. Therefore, it is optimal for a constrained firm not to pay any dividends and exhaust its borrowing capacity in both periods 0 and 1.

Thus the investment levels of constrained firms are given by:

$$I_0 = \frac{(c_0 - C)}{\lambda} \text{ and } I_1(c_1) = \frac{(c_1 + C)}{\lambda} \qquad (6.11)$$

where $\lambda \equiv 1 - q + \tau q$. The constrained firm's optimization problem is to find the cash holdings that maximise

$$g\left(\frac{c_0 - C}{\lambda}\right) - \frac{(c_0 - C)}{\lambda} + \mathrm{E}\left[h\left(\frac{c_1 + C}{\lambda}\right) - \frac{c_1 + C}{\lambda} | F\right] \qquad (6.12)$$

When a solution is interior, the optimal cash holdings $C^*(c_0, F)$ satisfy the following first-order condition:

$$g'\left(\frac{c_0 - C^*(c_0, F)}{\lambda}\right) = \mathrm{E}\left[h'\left(\frac{c_1 + C^*(c_0, F)}{\lambda}\right) | F\right] \qquad (6.13)$$

The above condition can be interpreted as follows: When the firm holds an additional dollar, this increases the marginal return on the investment in period 0, but decreases the expected marginal return on the investment in period 1. Therefore holding cash entails a trade-off, as explained above. The optimal condition is where the marginal return on investment in period 0 equals the marginal return on investment in period 1. By holding more cash the firm is able to relax the constraints on its ability to invest in the future.

To determine how much of its current cash flow a constrained firm will save, we need to calculate the derivative of $\partial C^*/\partial c_0$. This can be defined as the cash flow sensitivity of cash. The cash flow sensitivity of cash in the presence of financial constraints is given by the following:

$$\frac{\partial C^*}{\partial c_0} = \frac{g''(I_0^*)}{g''(I_0^*) + h''(I_1^*(c_1))} \qquad (6.14)$$

As this sensitivity is positive, it indicates that if a financially constrained firm gets a positive cash flow this period, it will optimally allocate the extra cash across time, saving a fraction of those resources to fund future investments.

6.4.4 IMPLICATIONS OF THE MODEL

The main implication of the model is that the cash flow sensitivity of cash $\partial C^*/\partial c_0$ is positive for constrained firms, while it is indeterminate for unconstrained firms. Empirically, this implies that constrained firms increase their cash holdings, that is, add to their liquid assets in response to increases in cash flows. $\partial C/\partial c_0$ is greater than 0 for these firms. Unconstrained firms on the other hand display no such systematic behaviour in liquidity management. $\partial C/\partial c_0$ is not statistically different from zero. In section 6.8, we empirically investigate the issues raised in the theoretical model.

6.5 HYPOTHESES

In this section, we develop three main testable hypotheses that will enable us to better understand the cash saving behaviour of listed Chinese manufacturing firms. First, we study the main determinants of cash holdings of these firms. Then, we take into account factors such as financial constraints and WTO accession.

a) FACTORS AFFECTING CHANGES IN CASH HOLDINGS OF CHINESE FIRMS

Many studies have examined the cash policies of firms in the US and the UK. However, none have studied the cash policies of Chinese firms. If Chinese firms behave like firms in other parts of the world, then factors that affect cash holdings of firms in the US should also affect the cash holdings of firms in China. Hence the first issue we investigate are the factors that might influence the cash holdings of these firms. This is important as it is clear that Chinese firms are the most important savers in the world. Our first hypothesis is therefore:

H1: Factors that affect cash holdings of firms in the US also affect the cash holdings of firms in China.

b) ACCOUNTING FOR FINANCIAL CONSTRAINTS

The next issue we investigate is whether financing constraints affect the cash holdings of listed Chinese manufacturing firms, that is whether the predictions of the ACW (2004) model hold. ACW (2004) find that constrained firms tend to save out of their cash flows leading to a positive relationship between changes in cash holdings and cash flow. Unconstrained firms on the other hand have an indeterminate relationship

between cash holdings and cash flow. To distinguish between constrained and unconstrained firms, we use a classification criterion that has been widely used in the investment-cash flow literature and classify firms according to their size, that is, the level of their real assets. We use the percentile methodology. Those firms that have their real assets in the lowest 25th percentile of the distribution of the real assets of all firms are classified as $SMALL_{it}$ as they are likely to be financially constrained (overall). This is done by industry and by year. All firms having their real assets in the top three quartiles of the distribution of the real assets of all firms are classified as $LARGE_{it}$ (by industry and year) as they are likely not to be financially constrained[70].

The second criterion that we use to account for financial constraints is the level of net profits of the firm. We classify those firms that are in the bottom quartile of the distribution of profits of all firms as *Low Profit*$_{it}$. This is done by industry and by year. Firms that are in the bottom quartile are seen to be financially constrained as they cannot invest at their first-best level and need to have recourse to external funds[71]. All firms having their profits in the top 3 quartiles of the distribution of profits of all firms are classified as *High Profit*$_{it}$ again by industry and by year.

More profitable firms can hold more cash if they choose to do so. Hence *High Profit* firms can have larger cash holdings than smaller firms. However, it might also be the case that larger firms find that they have easy access to debt finance and find no reason to save cash out of cash flows. In this case they would choose to save less cash and would have low cash holdings. Less profitable firms who find it more difficult to have access to external finance would more likely be saving more cash out of cash flows. However, it could also be the case that smaller firms need to allocate the cash flows towards investment (as they are financially constrained) and might not therefore be able to save cash out of cash flows.

We take the stand adopted by ACW (2004) and hypothesize that large/more profitable firms have indeterminate cash policies such that there will be no systematic savings of cash observed. For financially constrained firms, a positive relationship between changes in cash holdings and cash flow should be observed. Hence the hypothesis we test is that larger firms have an indeterminate cash policy as they are not financially constrained. Smaller firms are financially constrained and therefore should have a positive cash sensitivity to cash flow.

[70] We use other cut-off levels to check for robustness, however we do not report these results.
[71] In other words, these firms are regarded as being internally financially constrained.

H2: Larger firms or more profitable firms have an indeterminate cash flow sensitivity of cash while smaller firms or less profitable firms have a positive cash flow sensitivity of cash.

c) BANKING REFORMS AND WTO ACCESSION

Major banking reforms were undertaken in China in 1994 when the central government decided to separate policy banks from commercial banks. The banking reforms comprised important steps such as granting limited licenses to foreign banks, reducing government intervention in credit allocation and loosening interest rate controls (Shirai, 2002). However, until recently most bank credit was still directed to inefficient state enterprises; leaving good private enterprises without access to credit.

A further impetus to the reform in the banking sector came about with the imminent entry of China into the World Trade Organisation (WTO). The behaviour of the listed Chinese manufacturing firms that we consider suggest that there has been a pre and post WTO effect on the behaviour of these firms. In particular, pre-WTO these firms seem to have been accumulating quite large amount of cash while post-WTO this behaviour seems to have eased as shown in Figure 6.1 above. Between 1995 and 2000 these firms accumulated dramatic amounts of cash which peaked in 2001 and started declining thereafter. The reason for this could be that Chinese firms were uncertain as to what was going to happen once China joined the WTO especially regarding their access to bank credit.

One of the conditions imposed on China when it joined the WTO was that it would open its banking sector to foreign banks. Obviously now the state-owned firms would face competition from these banks. It was unclear to Chinese firms if the state-owned banks would still be lending to them and therefore despite their bad performance with declining profitability, they still added to their cash stock. They could also have taken debt and held on to that debt in the form of cash holdings. The behaviour of the subsidies variable (Figure 6.5 in Appendix 6.10) also suggests that even the government was uncertain about the WTO effect, so they increased the subsidies they gave to their listed firms before accession.

Hence we believe that the WTO agenda has had an important effect on the cash holdings of listed Chinese manufacturing firms. To investigate this, we examine whether cash holding decisions pre and post-WTO were different by splitting our sample into pre-WTO and post-WTO. We create two dummy variables. Pre-WTO is

a dummy equal to one if year is less than 2001 and zero otherwise. Post-WTO is a dummy equal to one if year is greater or equal to 2001 and zero otherwise. Therefore, the fourth hypothesis we test is:

H3: Cash Holding decisions of firms were different Pre-WTO and post-WTO.

6.6 PANEL DATA SPECIFICATION

Following OPSW (1999) and Ozkan and Ozkan (2004), we take the unobservable target cash ratio $Cash_{it}^{*}$ of firms as a function of several firm-specific characteristics, x, suggested by theory and a disturbance term ε_{it}. The firm specific characteristics, which might determine the optimal cash ratio of a firm might include for instance the cash flow, leverage, investment, size and other variables that proxy for the liquid assets of the firm.

$$\text{Cash}_{\text{it}}^{*} = \sum_{k=1}^{K} B_k x_{it} + \varepsilon_{it} \qquad (6.15)$$

where firms are represented by subscript $i=1,\ldots\ldots,N$ and time by $t=1\ldots\ldots,T$ and k is supposed to represent the number of explanatory variables that are included in the specification and therefore $k=1,2,3,\ldots$only. Firms adjust their cash holdings in order for their current cash ratio to be close to the target ratio.

The empirical specification to test the cash flow sensitivity of cash is estimated from a specification in which a firm's decision to change its cash holdings is modelled as a function of a number of sources and uses of funds. The reduced form model is adapted from ACW (2004), so that it is more appropriate for the Chinese case. The reduced form equation used to empirically investigate the cash holdings of Chinese firms is as follows:

$$\Delta Cash/Assets_{it} = \rho_0\, \Delta Cash/Assets_{it-1} + \rho_1 Profit_{it} + \rho_2\, \Delta NWC_{it} + \rho_3\, \Delta Leverage_{it} + \rho_4 Investment_{it} + \rho_5\, Log\ Sales_{it} + \rho_6\, Sales\ Growth_{it} + \alpha_i + \alpha_t + \mu_{it} \qquad (6.16)$$

The annual change of a firm's cash to assets ratio that is changes in cash holdings over assets is explained by changes in lagged cash holdings over assets and a function of the firm's profitability (*Profit*), ie, return on assets, changes in Net Working capital (ΔNWC), changes in leverage ($\Delta Leverage$), investment (*Investment*), size proxied by log of sales *(Log Sales*) and growth opportunities as captured by the sales growth variable (*Sales Growth*). These variables are discussed in detail below.

Profitability

The cash flow of firms is an important determinant of their cash holdings as found in a number of studies on the US. In the first instance, we proxy for cash flow by using a profitability measure. This is because the Chinese firms in our sample did not start reporting their cash flows until 1998. Firms with higher profitability would accumulate more cash everything else being equal as found by many studies on the US, where firms have a very strong motive for holding cash for precautionary reasons and thus, accumulate cash whenever they have the opportunity to do so. Figure 6.6 in the Appendix 6.13 shows the relationship between cash holdings and profitability. Until 2001, the listed Chinese manufacturing firms in our sample seem to have been saving cash out of their profits despite declining profitability. However, after 2001, there seems to be a positive relationship between cash holdings and profitability[72].

Net working capital (NWC_{it})

We include changes in net working capital in our regression as working capital can be a substitute for cash or it can compete for the available pool of resources as suggested by Fazzari and Petersen (1993). We calculate this measure as total current assets minus total current liabilities minus cash holdings such that this measure is net of cash holdings. Changes in NWC can be a substitute for cash as cash can be regarded to as being "negative NWC." This idea is similar to that proposed by Mikkelson and Partch (2002), who suggest that cash is negative debt. If net working capital is regarded as a substitute, then we would expect a negative relationship between changes in net working capital and changes in cash holdings. Figure 6.6 in Appendix 6.10 shows the behaviour of NWC over the 1995-2004 period. NWC has declined dramatically over the period. Figure 6.7 shows the relationship between cash holdings and NWC. It can be seen that after 1998, cash holdings have increased in the face of deteriorating NWC suggesting that these two variables are substitutes.

Leverage

Firms can use borrowing as a substitute for holding cash because leverage can act as a proxy for the ability of firms to issue debt. Firms that have high cash levels for

[72] As will be demonstrated later this behaviour can be linked to WTO accession and a change in the financial constraints that firms faced pre and post WTO.

instance are also known to have low leverage (Mikkelson and Partch, 2002). In the real world because of financing frictions, raising external funds is costly. Therefore firms could possibly regard cash and low (or negative) debt as substitutes. We would expect a negative relationship between cash holdings and leverage. Figure 6.4 above showed the relationship between cash holdings and leverage of the firms in our sample. Although leverage has not changed much over the years, cash holdings have increased dramatically.

Investment

We control for investment as it has been suggested in the literature that most of investment is potentially being financed by internal sources of finance (Myers, 1984, 2001). A financially constrained firm that has difficulty getting access to external sources of financing could possibly be using its cash holdings to finance investment. Therefore we expect a negative sign on the INVESTMENT term as cash holdings would fall when firms invest more and cash holdings would increase when firms invest less.

Size

We proxy for firm size using the log of sales (*Log Sales*) as has been used in prior studies (Kim, Mauer and Sherman (1998), Opler et al (1998), Ozkan and Ozkan (2003)). There are economies of scale in holding cash. For instance, it is often quoted in this literature that it is cheaper to hold cash than to send someone to the bank. Hence the larger the firm, the more cash that firm would hold. However, it could also be that larger firms suffer less from asymmetric information and can obtain funds at a relatively cheaper cost as lenders are willing to lend to these firms, in which case larger firms would hold less cash. The evidence put forward in the literature however suggests that larger firms hold more cash.

Sales Growth

Previous literature has found that growth opportunities affect the amount of cash firms hold (ACW, 2004, Ozkan and Ozkan, 2003). Firms with higher growth opportunities normally prefer to hold more cash. A possible explanation for this could be that internal funds like cash are the cheaper sources of funds and thus firms always prefer

to hold cash so that they can finance those growth opportunities when they come along. Another explanation put forward in the literature about cash holdings is that growth opportunities are intangible assets and therefore firms that have high growth opportunities are likely to face more agency costs. Due to this, these firms would resort to internal financing when possible. We capture growth opportunities by a growth in sales measure.

Subsidies

Although government intervention is said to have been greatly reduced since China undertook its reforms, there is a subsidy variable in our dataset that suggests that state intervention is not totally gone[73]. This subsidy variable is described as "various subsidies received by a company such as subsidy for loss due to government policies and refund of value-added tax." We scale the subsidies variable by net profit and find that the amount of subsidies received is up to 10%. These subsidies could be influencing the cash holding decisions of Chinese listed firms as constrained firms might be using their subsidies to finance their operations or simply adding them to their cash holdings. Because of this we include this subsidies measure in our regression specification.

We include another explanatory variable in other specifications:

Risk

Han and Qiu (2007) include a cash flow volatility measure in their study of cash holdings of US firms. They find that uncertainty proxied by a cash flow volatility measure positively influences the cash holdings of constrained US firms while it is insignificant for unconstrained firms. Unfortunately we cannot use a cash flow volatility measure as cash flow exists in our dataset only from 1998 onwards. Hence, as in Comin et al. (2006), Comin and Philippon (2005) and Garcia and Guariglia (2007), our main volatility measure is calculated as the standard deviation of the firm's total real sales growth, measured over a rolling window of 5 years (see Data Appendix for more details on this measure).

[73] China applies a series of measures that allow for refunds, reductions, or exemptions from taxes and other payments owed to the government. These appear designed to subsidize exports of manufactured goods or to support the purchase of domestic over imported equipment and certain other manufacturing inputs.

Since we use panel data, we include both a firm specific and time specific error term. Hence, the error term now consists of three components: v_i is a firm-specific fixed effect that controls for unobserved time-invariant characteristics, ν_t represents a time specific component and reflects aggregate effects common across companies to control for macroeconomic influences, including factors as nominal interest rates and inflation, ε_{it} is an idiosyncratic error term.

We estimate equation *(6.18)* using the first-difference Generalised Method of Moments (GMM) estimator, (Arellano and Bond, 1991) which takes into account both firm-specific heterogeneity and potential endogeneity of regressors. Our instrument set in the baseline specification includes $(Cash_{it})_{it-1}$, $(Profitability)_{it}$, $(\Delta NWC)_{it}$, $(\Delta Leverage)_{it}$, $(Investment)_{it}$, $(Log\ Sales)_{it}$, $(Sales\ Growth)_{it}$ and $(Subsidies)_{it}$ which are lagged 2 to 5 times. In other specifications, we include $(Risk)_{it}$ lagged 2 to 3 times (where possible) in our instrument set.

We use the Sargan test and the m2 to evaluate if our model is correctly specified. The J statistic is the Sargan/Hansen test for overidentifying restrictions. Under the null of instrument validity, the J statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of instruments less the number of parameters. If the model used is correctly specified and the instruments are adequate, the variables in the instrument set should not be correlated with the idiosyncratic component of the error term ε_{it}. On the other hand, the m2 test, which tests for second-order serial correlation, is asymptotically distributed as standard normal under the null of second-order serial correlation[74]. This test provides a further check on the specification of the model and on the validity of variables dated t-2 as instruments.

6.7 **DATA AND SUMMARY STATISTICS**

Unlike previous studies, that have mainly focussed on US firms and firms in the UK, we focus on Chinese firms in the manufacturing sector. The paper uses a relatively new database which is the China Stock Market and Accounting Research Database (CSMAR), developed and maintained jointly by the Centre for China Financial Research at the University of Hong Kong and the Shenzhen GTA Information

[74] If the p-values for the Sargan and the m2 test are both greater than 0.05, then the instruments are acceptable.

Technology Co. The CSMAR-A Database has collected the data available in all the annual reports of A-share companies listed on the Shanghai and Shenzhen Stock Exchanges since 1990. No other existing financial database on China listed companies is as comprehensive. The data is collected from a number of first- hand sources such as Securities Times, Shanghai Securities daily and China Securities Daily. It contains the financial data (including the balance sheet, statement of profit and profit distribution, statement of changes in financial position and cash flow statement) of all companies listed on both exchanges.

Table 6.1 shows that Chinese firms have indeed accumulated quite large amounts of cash. In a period of less than 10 years, their cash holdings have almost doubled (from 10% in 1996 to 20% in 2004). The summary statistics also indicate that until 2001, listed Chinese manufacturing firms have accumulated quite large amounts of cash but after 2001, cash holdings have started to fall. Profitability has deteriorated over the whole period while the negative summary statistics obtained for Net Working Capital indicates that the current liabilities far exceed the current assets (net of cash) of these firms. Leverage is around 22%. The sales growth measure which acts as a proxy for capturing growth opportunities indicates that in 2001, growth opportunities were seriously affected (possibly due to WTO accession).

The risk measure capturing the volatility of sales growth, calculated as the standard deviation of sales growth over a 5 year rolling window, indicates that the volatility of sales growth has steadily declined over the period considered. The subsidies variable defined as "various subsidies received by a company such as subsidy for loss due to government policies and refund of value-added tax" indicates that firms still receive quite substantial amounts of subsidies (compared to their profits) over the period considered.

In Table 6.2, we show the summary statistics using the classification scheme where firms are classified according to financial constraints. We use the distribution of real assets to act as a proxy for financial constraints and similar to previous literature, we assume that larger firms are financially unconstrained while smaller firms are financially constrained. In columns 1 and 2, firms are classified according to distribution of real assets while in columns 3 and 4 firms are classified according to the distribution of profits. In columns 5 and 6, we classify firms as belonging to either Pre-WTO firm-years or Post-WTO firm-years.

As expected (and found by OPSW (1999) and ACW (2004) in the case of US firms), larger listed Chinese manufacturing firms hold less cash (17% of assets) while smaller firms hold a large portion of their assets in cash (25% of assets). This possibly indicates that smaller firms are financially constrained and therefore hold more cash than larger firms. Larger firms are more highly levered indicating that larger firms can get easy access to external finance. The risk and subsidies variables are the same for all sizes if firms.

In columns 3 and 4, we classify firms as *Low Profit*$_{it}$ and *High Profit*$_{it}$ according to their level of profitability. We find that firms that have low profits actually hold less cash, giving evidence that these firms cannot save out of profits. High profit firm-years have better growth opportunities, which is not surprising since growth opportunities are calculated as the growth in sales and profits in turn depend largely on sales (as manufacturing firms are considered here).

Next, in columns 5 and 6, we consider pre-WTO and post-WTO firm-years as we noticed a significant change in the cash holding behaviour of Chinese firms before and after 2001, the year in which China gained access to WTO membership. Pre WTO, the firms are holding more cash (around 22% of assets) while post WTO, the firms are holding less cash (around 15% of assets). As we discussed before, this behaviour of accumulating cash before WTO accession could be associated with the uncertainty that these firms faced during this period.

6.8 REGRESSION RESULTS

Table 6.3 shows our regression results. The lagged change in cash holdings is negative which suggests that firms do have an optimal cash holding target. The results indicate that Chinese firms do not tend to save out of their profits as suggested by the statistically insignificant coefficient on the profitability term. In the ACW (2004) world, this would imply that Chinese firms are financially unconstrained, that is, they have indeterminate cash policies because their cash flows (net profits) do not affect changes in their cash holdings. This could indicate that these listed Chinese firms face soft budget constraints. The presence of these soft budget constraints imply that firms do not have difficulties in finding financing sources especially in the form of funding from the state or local authorities.

On the other hand, we know that listed Chinese firms are possibly financially constrained as these firms operate in a highly imperfect and underdeveloped financial

system. They face severe restrictions on share issues as they have to satisfy a number of criteria before they are allowed to issue any new shares. The insignificant coefficient on the profitability variable is reflected by Figure 6.4 which shows that there is no relationship between cash holdings and profitability over the period. While profits remained stagnant and deteriorated, cash holdings increased significantly indicating that there is no specific relationship between them.

Similar to the results obtained by ACW (2004) and OPSW(1999) we find that listed Chinese firms have a negative relationship between changes in cash holdings and changes in NWC (-0.317), if NWC increases the change in cash holdings is negative as firms hold less cash suggesting that NWC and cash holdings are substitutes. A negative relationship (-0.738) is also observed between the change in cash holdings and changes in leverage suggesting that if the change in leverage increases the change in cash holdings falls. Chinese firms have low profitability and their cash holdings are quite high. One possible reason for them to be able to do so was that they took debt and saved part of that debt. For this to be the case, we should have observed a positive relationship between changes in leverage and changes in cash holdings. However, the negative relationship observed suggests that listed Chinese firms do not use debt to accumulate cash.

The coefficient obtained on the investment term suggests that investment is significant indicating that cash holdings are used for financing investment. The coefficient on size is positive and significant suggesting that size influences cash holdings of firms. The sales growth term suggests that there is a negative relationship between growth opportunities and changes in cash holdings. However the term is insignificant.

We perform a series of robustness checks. In column 2, we include the subsidies variable in our regression specification. The results obtained are robust to the ones obtained previously. The insignificant coefficient on the subsidies variable possibly indicates that subsidies do not affect cash holdings. In Column 3, we include a risk measure to account for any uncertainty that these firms might face over the period considered. Because this risk measure is calculated as the standard deviation of the firm's total real sales growth, measured over a rolling window of 5 years we lose observations for the following years 1995, 1996, 2003, 2004. Including the risk variable changes our results significantly but the risk variable itself is insignificant. A possible explanation for this could be the fact that the sales of these listed firms have

remained quite stable over the period considered in this paper and therefore the firms have not experienced much volatility over this period.

In columns 4, 5 and 6, we use data from the year 2000 onwards. The reason for doing this is Figure 6.3, which indicates that the cash holdings behaviour started to change after the year 2000. Also, after the year 2000, the relationship between cash holdings and profitability seems to have changed as well. In column 4 we use the same specification as in column 1 while in column 5 we use the same specification as in column 2 where we include the subsidy variable in the specification; all data is from 2000 onwards. In column 6, we use the same specification as in column 1 but we use a cash flow measure instead of profits (as used by ACW, 2004). The results for the 3 specifications in columns 4, 5 and 6 are quite robust. However, they also suggest that the determinants of cash flow after the year 2000 are not the same. Especially, changes in leverage no longer affect cash holdings. This can be explained by the fact that post 2001 firms have started to face difficulties in obtaining loans from banks and leverage is therefore irrelevant in their cash holding decisions.

6.8.1 RESULTS: ACCOUNTING FOR FINANCIAL CONSTRAINTS

In Table 6.4, we take into account similar classification scheme used by ACW (2004) and classify firms as financially constrained and unconstrained.

The regression specification used is the one used previously but all the variables are interacted with two dummy variables as shown below:

$$\Delta Cash/Assets_{it} = \beta_{01}\,\Delta Cash/Assets_{it-1}*SMALL_{it} + \beta_{02}\,\Delta Cash/Assets_{it-1}*LARGE_{it} + \beta_{11}Profit_{it}*SMALL_{it} + \beta_{12}Profit_{it}*LARGE_{it} + \beta_{21}\Delta NWC_{it}*SMALL_{it} + \beta_{22}\Delta NWC_{it}*LARGE_{it} + \beta_{31}\Delta Leverage_{it}*SMALL_{it} + \beta_{32}\Delta Leverage_{it}*LARGE_{it} + \beta_{41}Investment_{it}*SMALL_{it} + \beta_{42}Investment_{it}*LARGE_{it} + \beta_{51}\,Log\ Sales_{it}*SMALL_{it} + \beta_{52}\,Log\ Sales_{it}*LARGE_{it} + \beta_{61}\,Sales\ Growth_{it}*SMALL_{it} + \beta_{62}\,Sales_{it}*LARGE_{it} + \beta_{71}Subsidies_{it}*SMALL + \beta_{72}Subsidies_{it}*LARGE + \gamma_i + \gamma_t + \varepsilon_{it} \quad (6.17)$$

We next distinguish between financially constrained and unconstrained firms taking into account the profitability of firms.

$$\Delta Cash/Assets_{it} = \beta_{01}\ \Delta Cash/Assets_{it-1}*LOWPROFIT_{it} + \beta_{02}\Delta Cash/Assets_{it-1}*HIGH PROFIT_{it}+\beta_{11}Profit_{it}*LOWPROFIT_{it}+\beta_{12}Profit_{it}*HIGHPROFIT_{it}+\beta_{21}\Delta NWC_{it}*LOWP ROFIT_{it}+\beta_{22}\Delta NWC_{it}*HIGHPROFIT_{it}+\beta_{31}\Delta Leverage_{it}*LOWPROFIT_{it}+\beta_{32}\Delta Leverage_{it} *HIGHPROFIT_{it}+\beta_{41}Investment_{it}*LOWPROFIT_{it} + \beta_{42}Investment_{it} *HIGHPROFIT_{it}+ \beta_{51}LogSales_{it}*LOWPROFIT_{it}+\beta_{52}LogSales_{it}*HIGHPROFIT_{it}+\beta_{61}SalesGrowth_{it}*LOW PROFIT_{it}+\beta_{62}SalesGrowth_{it}*HIGHPROFIT_{it}+\beta_{71}Subsidies_{it}*HIGHPROFIT +\beta_{72}Subsidies_{it}*LOWPROFIT +\gamma_i + \gamma_t + \varepsilon_{it} \quad (6.18)$$

In column (1) of Table 6.4, we account for financial constraints using the distribution of real assets. As mentioned previously, those firms that have their real assets in the lowest 25th percentile of the distribution of the real assets of all firms are classified as $SMALL_{it}$ ($Dummy1_{it}$) as they are likely to be financially constrained. This is done by industry and by year. All firms having their real assets in the top three quartiles of the distribution of the real assets of all firms are classified as $LARGE_{it}$ $(Dummy2_{it})$ (by industry and year) as they are likely not to be externally financially constrained.

The results indicate that, when firms are classified as being financially unconstrained according to the distribution of their real assets, the factors that affect changes in cash holdings of Chinese firms are changes in working capital, changes in leverage and investment (at least for the large firms). Most of these variables are insignificant for the smaller firms suggesting perhaps that these firms do not operate according to firm fundamentals.

The profitability term is insignificant for both small and large firms. In the ACW (2004) world, this would imply that Chinese firms are unconstrained, that is, they have indeterminate cash policies because their cash flows (net profits) do not affect changes in their cash holdings. However, this explanation is unlikely to make much sense. The reason why all the coefficients could be insignificant could possibly be because we consider listed firms. As shown in the summary statistics, these listed firms are not very different in their levels of profitability or when classified according to the level of real assets. Hence the lack of variation among the firms in our dataset could possibly explain this result. Also as discussed before, Figure 6.4 in Appendix 6.10 clearly shows that there is no relationship between cash holdings and profitability of these firms.

For large firms, changes in NWC are negatively (and significantly) related to changes in cash holdings, again giving evidence that NWC and cash holdings are

substitutes. Changes in leverage are negatively related to changes in cash holdings suggesting that at least large firms do not use leverage to accumulate cash. Investment is negatively related to changes in cash holdings indicating that some investment of both small and large firms is funded internally (ie from cash flows). The size variable is irrelevant possibly because of the lack of variation in characteristics of the firms we consider. Similar results are obtained when we use the distribution of real profits to classify firms as being financially constrained or unconstrained as shown in column 2.

In column 3, we take into account whether there has been a WTO effect on the cash holdings of firms. *Dummy1* stands for pre-WTO while *Dummy2* stands for post-WTO. In this case, the interesting result is that post-WTO firms actually accumulate cash out of profits (0.643) as suggested by the positive and significant coefficient on the profit variable. In an ACW (2004) world this would suggest that firms were financially unconstrained pre-WTO but post-WTO, they are financially constrained. This could well possibly be the case. Pre-WTO, firms could get easy access to loans as banks were always willing to lend to these firms. However, with WTO coming in, domestic banks started to face competition from foreign banks and as domestic banks became unwilling to lend to these firms, firms started to find difficulties to get access to finance and thus became financially constrained.

We next take into account how financial constraints have changed by taking into account both financial constraints and WTO accession. We do this by interacting the profitability variable with both a dummy measuring financial constraints and a dummy indicating WTO accession. Hence the regression specification used is as follows:

$$\Delta Cash/Assets_{it} = \beta_{01}\,\Delta Cash/Assets_{it-1}*PREWTO_{it} + \beta_{02}\,\Delta Cash/Assets_{it-1}*POSTWTO_{it}$$
$$+\beta_{111}Profit_{it}*PREWTO*LOWPROFIT_{it}+\beta_{112}Profit_{it}*PREWTO*HIGHPROFIT_{it}$$
$$+\beta_{121}Profit_{it}*POSTWTO*LOWPROFIT_{it}+\beta_{122}Profit_{it}*PREWTO*HIGHPROFIT_{it}$$
$$+\beta_{21}\Delta NWC_{it}*PREWTO+\beta_{22}\Delta NWC_{it}*POSTWTO+\beta_{31}\Delta Leverage_{it}*PREWTO$$
$$+\beta_{32}\Delta Leverage_{it}*POSTWTO+\beta_{41}Investment_{it}*PREWTO+\beta_{42}Investment_{it}*POSTWTO$$
$$+\beta_{51}Log\ Sales_{it}*PREWTO+\beta_{52}Log\ Sales_{it}*POSTWTO_{t}+\beta_{61}SalesGrowth_{it}*PREWTO$$
$$+\beta_{62}SalesGrowth_{it}*POSTWTO+\beta_{71}Subsidies_{it}*PREWTO\ +\beta_{72}Subsidies_{it}*POSTWTO$$
$$+\gamma_i + \gamma_t + \varepsilon_{it} \quad (6.20)$$

The results indicate that in the pre WTO years profitability did not influence the change in cash holdings for both low profit and high profit firms. The respective coefficients of -0.248 and 0.436 obtained on low profit and high profit firm years are not significant. In an ACW (2004) world, this implies that firms were financially unconstrained irrespective of their levels of profitability. Listed Chinese manufacturing firms did not accumulate cash out of their profits. This also reflects the fact that firms were possibly benefiting from soft budget constraints and therefore they did not find it important to save cash out of their profits before China joined the WTO.

However the results obtained are quite different for the post WTO years. The coefficient obtained for both low profit and high profit firm years are positive and significant (0.402 and 0.967 respectively). This indicates that post WTO accession, listed Chinese manufacturing firms are accumulating cash out of their profits. According to ACW (2004) model, this indicates that these firms are now financially constrained. The coefficient for high profit firms is larger as this indicates that financially constrained firms that are more profitable are able to save more cash out of their profits. The results therefore indicate that firms with high profit firms in the post WTO period accumulate more cash out of their profits than low profit firms. The F statistics obtained ($F(2,556)=9.41$) suggest that these two coefficients are significantly different from each other. To check for the robustness of our results, we interact the profitability variable with both a dummy capturing financial constraints through the distribution of real assets and a dummy indicating WTO accession. The results are shown in Table 6.6[75].

6.9 CONCLUSION

In this paper, we study the cash holding decisions of listed Chinese manufacturing firms. The main motivation for this study is the very high savings rate observed among Chinese firms especially in the years preceding China joining the WTO. We start off from the ACW (2004) framework where we assume that constrained firms would save cash out of their cash flows while unconstrained firms would exhibit no such relationship.

[75] The results are mostly robust. However, the results indicate that larger firms in the PREWTO period have a positive coefficient on the profitability term. This indicates that these firms were saving cash out of their profits. This contradicts our predictions.

We then examine 3 main hypotheses. First we examine if factors that affect cash holdings in other parts of the world also affect the cash holdings of firms in China. The results we obtain suggest that some of the determinants of cash holdings in other parts of the world (especially the US) also affect the cash holdings of Chinese firms. Second we distinguish among financially constrained and unconstrained firms using a number of criteria. The results suggest that Chinese firms do not save out of their profits. We explain this result through the lack of variation in firm characteristics of listed Chinese firms. Third, we investigate if WTO accession has changed firm behaviour especially in the case of cash savings. We find that firms save out of their profits post-WTO, but it is not clear where the high cash savings in the pre-WTO years were coming from.

Overall the results suggest that the factors that mainly affect changes cash holdings of listed Chinese firms are changes in NWC and changes in leverage. These two variables are negatively related to changes in cash holdings and suggest that firms only increase their cash holdings when NWC decreases or the amount of leverage falls. Obviously there are some limitations in our study which mainly amount to data limitations. First, we do not have a cash flow measure and we mainly rely on net profits to proxy for cash flows. Second, firms in our sample are all large firms and there is not much variation among them. Third, we control for growth opportunities through a sales growth measure, which might not properly capture growth opportunities. Our results should therefore be interpreted cautiously as we are here focussing solely on the behaviour of listed manufacturing firms which are typically large firms and are a tiny sample of the population of Chinese firms. Lastly, we have been able to identify in this study what factors affect the cash holdings of listed Chinese manufacturing firms. Where this cash is being generated from still remains a mystery and could potentially be an area of future research.

6.10 DATA APPENDIX

STRUCTURE OF UNBALANCED PANEL

Number of years of observation	Frequency	Percent	Cumulative
1	73	1.52	1.52
2	88	1.83	3.35
3	153	3.19	6.54
4	400	8.33	14.87
5	700	14.58	29.45
6	558	11.62	41.07
7	651	13.56	54.62
8	536	11.16	65.79
9	468	9.75	75.53
10	240	5	80.53
11	495	10.31	90.84
12	348	7.25	98.08
13	78	1.62	99.71
14	14	0.29	100
Total	4,802	100	

DEFINITION OF VARIABLES

Cash Holdings (*Cash Holdings*)
The company total of cash in hand, bank deposits, overseas deposits, bank draft deposits, credit card deposits, L/Cs etc.
Index Number of Data Field: A110101

Cash Flow (*CF*)
Calculated at the sum of net income plus depreciation plus the amortisation of other long-term assets, intangible assets and long-term prepaid expenses.
Index Number of Data Fields: D610701, D610801, D610851

Leverage *(LEV)*
Calculated as the sum of short-term and long-term debt scaled by assets.

Short-term debt *(STD)*
Borrowing with a maturity of less than one year (including one year) and not yet repaid scaled by assets.
Index Number of Data Field: A210101

Long-term Debt *(LTD)*
Debt that the company borrows from banks or other financial institutions, with a maturity of over one year (not including one year) scaled by assets.
Index Number of Data Field: A220101

Investment *(INV)*
Investment is calculated as the change in tangible assets plus depreciation.

Net Profit (*PROFIT)*
The net profit realized by a company scaled by assets.
Index Number of Data Field: B150101

Net Assets (*Net Assets*)
Calculated as total assets minus cash holdings.
Index Number of Data field: A100000

Net Working Capital *(NWC)*
Calculated as total current assets minus total current liabilities minus cash holdings.
Index Number of Data field: A110000, A210000,A110101

Sales *(Sales)*
Revenue from Main Operations is calculated as the log of the real revenues generated by the main operating activities of a company. Sales growth (*SalesG*) is calculated as the change in log of real sales using the above measure.
Index Number of Data Field: B110101

Subsidies (*SUBSIDY*)
Various subsidies received by a company such as subsidy for loss due to government policies, and refund of value-added tax.
Index Number of Data field: B130402
Investment (*Investment*)
Calculated as the change in tangible assets plus depreciation.

Risk
As in Comin et al. (2006) and Comin and Philippon (2005), our main volatility measure is calculated as the standard deviation of the firm's total real sales growth, measured over a rolling window of 5 years. Specifically, denoting with $Totalvol_{it}$ this standard deviation for firm i at time t; with $srgr_{it}$, the growth rate of the real sales of firm i at time t, and with $_{it}$, the average growth rate between t-2 and t+2, we have:

$$\text{Total Vol}_{it}=\left[\frac{1}{5}\sum_{t-2}^{2}(srgr_{i(t+\tau)}-\mu_{it})^{2}\right]^{1/2}$$

FIGURE 6.1: SAVINGS AND INVESTMENT IN CHINA
(per cent of GDP)

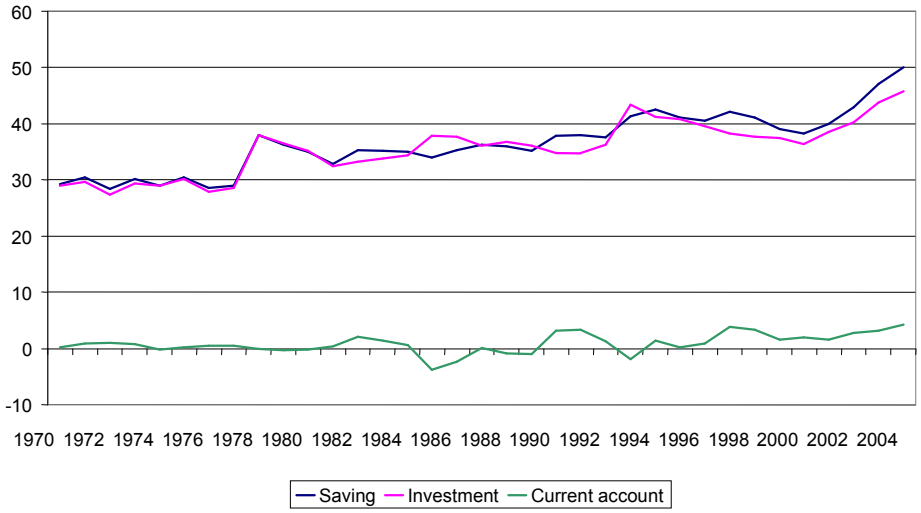
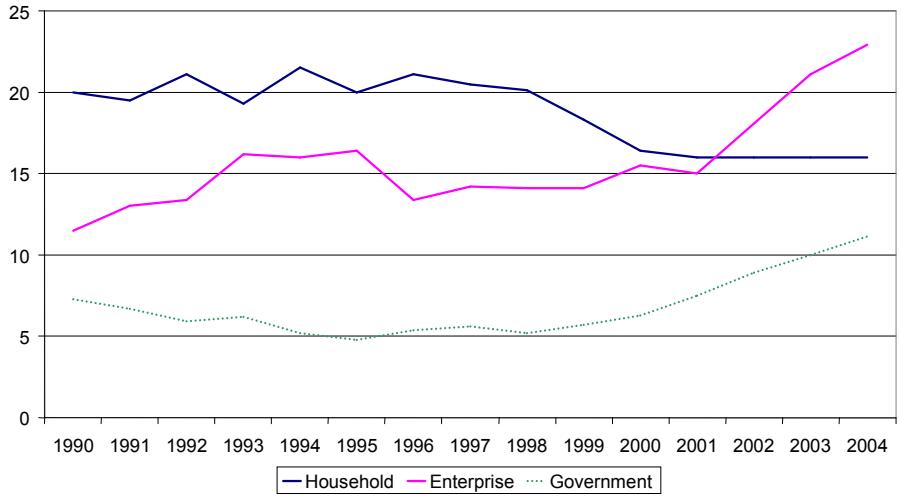
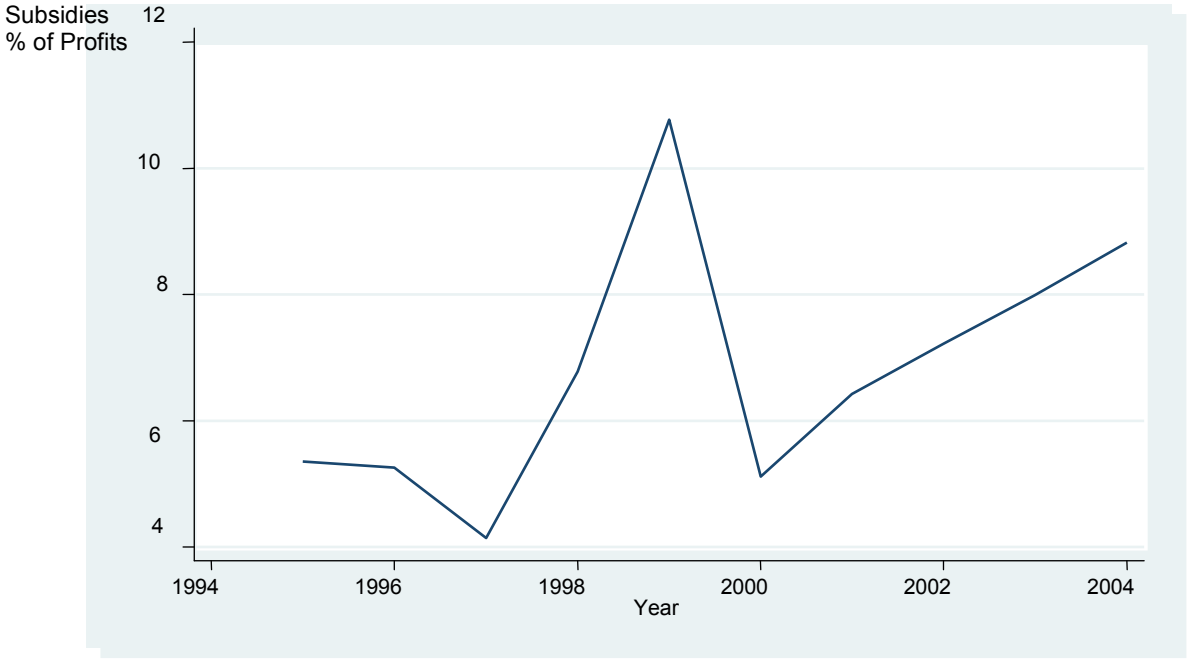


FIGURE 6.2: SOURCES OF CHINESE SAVINGS
(per cent of GDP)



Source: Martin Wolf, Financial Times

Figure 6.5: SUBSIDIES



The figure above shows how subsidies scaled by net profit behaved over the period. As can be seen it is positive in all years and peaked in 1999. This behaviour could possibly be related to China joining the WTO in 2001. China had to comply with some regulations before joining the WTO and one of them included that it would not provide subsidies to its firms that would thereby allow them to compete unfairly against firms in other parts of the world. The trend of the subsidies variable scaled by profit exhibits an upward trend until 1999 and drops sharply just before 2000, that is, just before China joined the WTO. After 2001 (once China joined WTO), subsidies are on the rise again indicating that even among listed firms state intervention still exists. It is clear from the diagram above that subsidies are still being used.

Figure 6.6: NET WORKING CAPITAL as a % of NET ASSETS

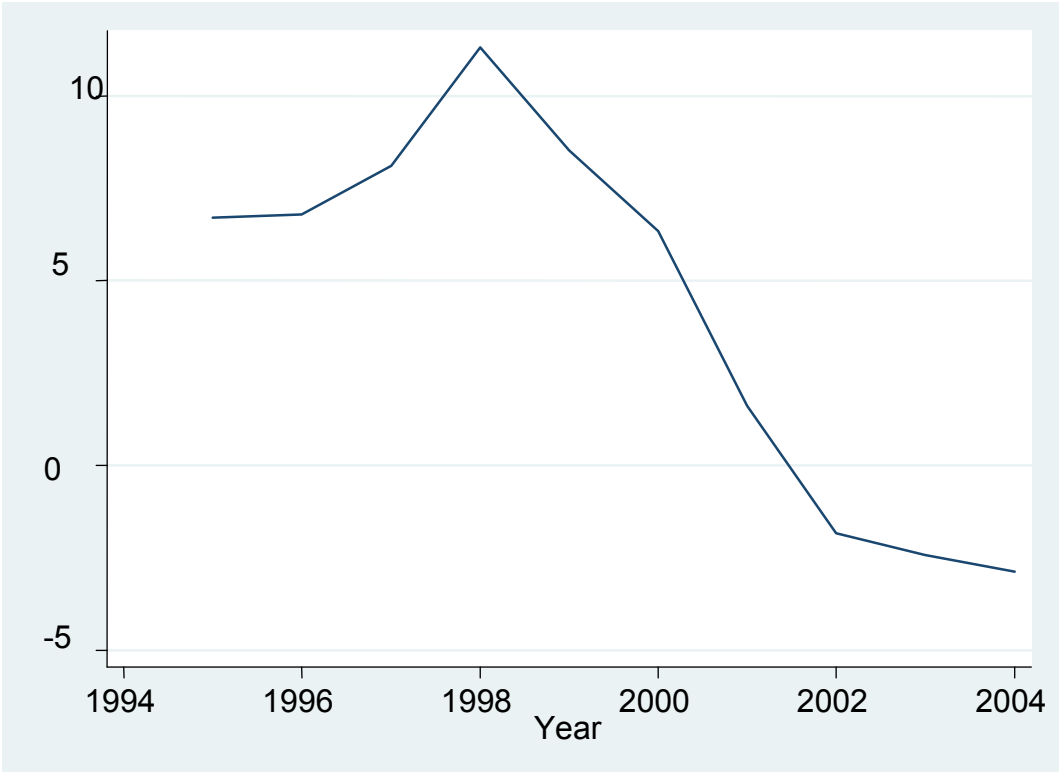


Figure 6.7: RELATIONSHIP BETWEEN CASH HOLDINGS AND NWC

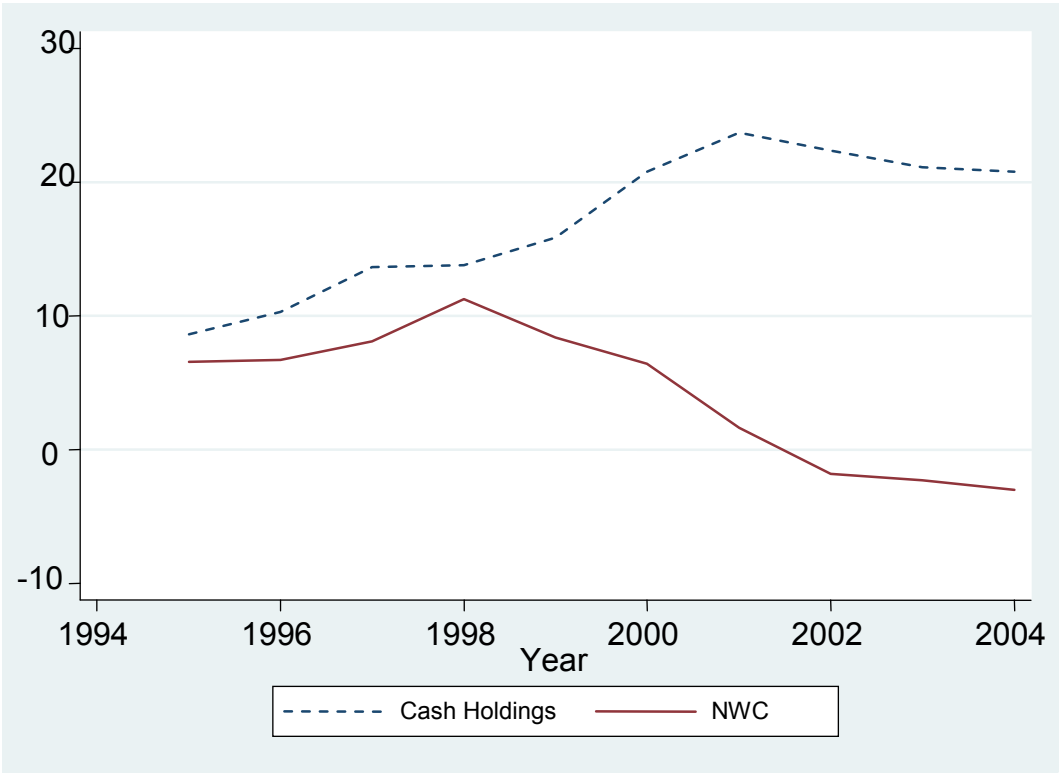


Figure 6.8: RELATIONSHIP BETWEEN CASH HOLDINGS AND LEVERAGE

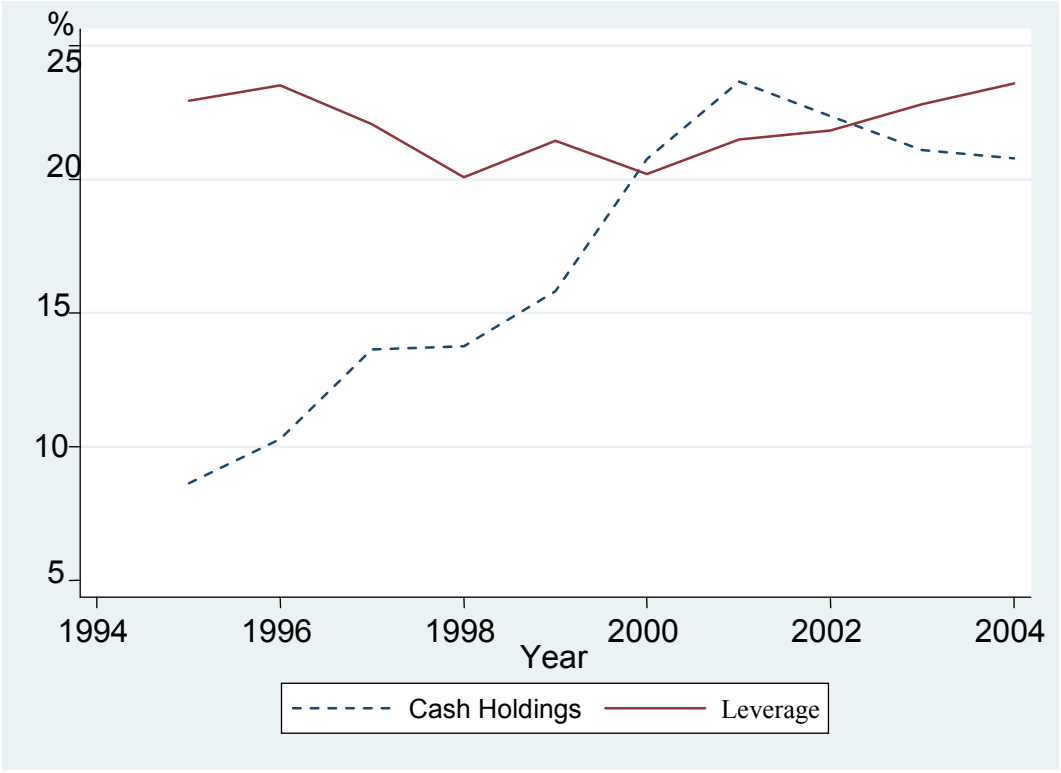


TABLE 6.1: SUMMARY STATISTICS

	Full sample	*Sample Used in Estimation*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
(CashHoldings/ N.Assets)$_{it}$	*0.192*		*0.102*	*0.115*	*0.133*	*0.159*	*0.204*	*0.241*	*0.220*	*0.206*	*0.203*
	(0.170)	*--*	*(0.098)*	*(0.108)*	*(0.127)*	*(0.128)*	*(0.182)*	*(0.195)*	*(0.182)*	*(0.165)*	*(0.171)*
(ΔCash Holdings/Net Assets)$_{it}$	*-0.019*	*-0.003*	*-0.000*	*-0.001*	*-0.017*	*-0.018*	*-0.003*	*0.020*	*0.003*	*-0.032*	*-0.035*
	(0.144)	*(0.118)*	*(0.048)*	*(0.106)*	*(0.146)*	*(0.148)*	*(0.134)*	*(0.145)*	*(0.162)*	*(0.142)*	*(0.124)*
(Profit/ Net Assets)$_{it}$	*0.040*	*0.032*	*0.055*	*0.055*	*0.053*	*0.055*	*0.053*	*0.037*	*0.031*	*0.030*	*0.031*
	(0.055)	*(0.049)*	*(0.053)*	*(0.054)*	*(0.060)*	*(0.048)*	*(0.047)*	*(0.056)*	*(0.056)*	*(0.055)*	*(0.055)*
(NWC/ Net Assets)$_{it}$	*0.023*	*--*	*0.069*	*0.082*	*0.115*	*0.086*	*0.064*	*0.017*	*-0.017*	*-0.022*	*-0.027*
	(0.180)		*(0.152)*	*(0.163)*	*(0.155)*	*(0.175)*	*(0.176)*	*(0.170)*	*(0.176)*	*(0.181)*	*(0.184)*
(ΔNWC/ Net Assets)$_{it}$	*-0.030*	*-0.025*	*-0.020*	*0.002*	*0.005*	*-0.044*	*-0.037*	*-0.059*	*-0.038*	*-0.015*	*-0.026*
	(0.116)	*(0.109)*	*(0.082)*	*(0.111)*	*(0.100)*	*(0.102)*	*(0.125)*	*(0.126)*	*(0.118)*	*(0.113)*	*(0.112)*
(Leverage/ N.Assets)$_{it}$	*0.219*	*--*	*0.239*	*0.224*	*0.200*	*0.216*	*0.203*	*0.213*	*0.216*	*0.229*	*0.233*
	(0.127)		*(0.111)*	*(0.114)*	*(0.119)*	*(0.126)*	*(0.120)*	*(0.123)*	*(0.130)*	*(0.137)*	*(0.134)*
(ΔLeverage/ N.Assets)$_{it}$	*0.014*	*0.011*	*0.018*	*-0.000*	*0.007*	*0.020*	*0.004*	*0.027*	*0.007*	*0.015*	*0.015*
	(0.072)	*(0.068)*	*(0.053)*	*(0.067)*	*(0.068)*	*(0.063)*	*(0.073)*	*(0.076)*	*(0.073)*	*(0.073)*	*(0.071)*
(Investment/ N.Assets) $_{it}$	*0.072*	*0.064*	*0.163*	*0.147*	*0.064*	*0.056*	*0.056*	*0.079*	*0.094*	*0.074*	*0.061*
	(0.087)	*(0.080)*	*(0.141)*	*(0.071)*	*(0.078)*	*(0.081)*	*(0.076)*	*(0.097)*	*(0.085)*	*(0.088)*	*(0.088)*
(Log Sales)$_{it}$	*13.379*	*13.720*	*12.172*	*12.316*	*13.152*	*13.309*	*13.445*	*13.438*	*13.539*	*13.622*	*13.648*
	(1.077)	*(1.019)*	*(0.995)*	*(0.998)*	*(0.975)*	*(0.964)*	*(0.981)*	*(0.991)*	*(1.027)*	*(1.065)*	*(0.984)*
(Sales Growth)$_{it}$	*0.135*	*0.081*	*-0.145*	*0.110*	*0.865*	*0.151*	*0.120*	*0.035*	*0.132*	*0.135*	*0.067*
	(0.422)	*(0.329)*	*(0.465)*	*(0.508)*	*(0.550)*	*(0.429)*	*(0.370)*	*(0.392)*	*(0.366)*	*(0.338)*	*(0.347)*
(Subsidies)$_{it}$	*0.074*	*--*	*0.052*	*0.040*	*0.086*	*0.111*	*0.048*	*0.066*	*0.079*	*0.079*	*0.233 (-0.038)*
	(0.208)		*(0.177)*	*(0.133)*	*(0.243)*	*(0.241)*	*(0.115)*	*(0.195)*	*(0.229)*	*(0.218)*	
(Risk)$_{it}$	*0.378*	*--*	*---*	*0.603*	*0.510*	*0.481*	*0.400*	*0.317*	*0.306*	*---*	*---*
	(0.249)			*(0.319)*	*(0.283)*	*(0.259)*	*(0.239)*	*(0.218)*	*(0.204)*		
Sample size	*3750*	*1357*	*133*	*191*	*269*	*304*	*448*	*525*	*571*	*594*	*623*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript i denotes firms and the subscript t denotes time where t=1995-2004. (*CASH HOLDINGS/ASSETS*) is the company's total of cash in hand, bank deposits, overseas deposits, bank draft deposits, credit card deposits and L/C deposits etc. *ΔCASH HOLDINGS/ASSETS* is the change in cash holdings normalised by 100. *Net Working capital (NWC)* is calculated as current assets minus current liabilities minus cash holdings, *ΔLEVERAGE* is the change in debt, *INVESTMENT* is investment, *LogSales* is size proxied by log of sales and *SalesGrowth* is growth opportunities as captured by the sales growth variable. *Subsidies* are total subsidies received scaled by net profits. *Risk* is calculated as the standard deviation of the firm's total real sales growth, measured over a rolling window of 5 years. We also report summary statistics for the sample used in estimation for the baseline specification in column 2. In the rest of the columns we report the summary statistics over the years 1996 -2004.

Table 6.2:SUMMARY STATISTICS

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	SMALL	*LARGE*	*LOW PROFIT*	*HIGH PROFIT*	*PRE-WTO*	*POST-WTO*
(Cash Holdings/N.Assets)$_{it}$	*0.246*	*0.174*	*0.129*	*0.216*	*0.217*	*0.152*
	(0.217)	*(0.147)*	*(0.121)*	*(0.179)*	*(0.179)*	*(0.146)*
(ΔCash Holdings/Net Assets)$_{it}$	*-0.020*	*-0.017*	*-0.017*	*-0.019*	*-0.029*	*0.004*
	(0.172)	*(0.134)*	*(0.101)*	*(0.159)*	*(0.148)*	*(0.131)*
(Profit/ Net Assets)$_{it}$	*0.042*	*0.040*	*-0.013*	*0.061*	*0.032*	*0.053*
	(0.061)	*(0.053)*	*(0.062)*	*(0.034)*	*(0.055)*	*(0.051)*
(NWC/ Net Assets)$_{it}$	*0.068*	*0.009*	*-0.006*	*0.034*	*-0.013*	*0.081*
	(0.192)	*(0.175)*	*(0.186)*	*(0.177)*	*(0.179)*	*(0.167)*
(ΔNWC/ Net Assets)$_{it}$	*-0.033*	*-0.030*	*-0.041*	*-0.026*	*-0.033*	*-0.024*
	(0.133)	*(0.110)*	*(0.108)*	*(0.119)*	*(0.118)*	*(0.111)*
(Leverage/ N.Assets)$_{it}$	*0.187*	*0.229*	*0.269*	*0.200*	*0.223*	*0.213*
	(0.117)	*(0.128)*	*(0.124)*	*(0.123)*	*(0.132)*	*(0.119)*
(ΔLeverage/ N.Assets)$_{it}$	*0.011*	*0.014)*	*0.016*	*0.013*	*0.015*	*0.009*
	(0.071)	*(0.072)*	*(0.066)*	*(0.074)*	*(0.073)*	*(0.068)*
(Investment/N.Assets) $_{it}$	*0.057*	*0.076)*	*0.035*	*0.087*	*0.077*	*0.059*
	(0.084)	*(0.087*	*(0.076)*	*(0.087)*	*(0.090)*	*(0.079)*
(Log Sales)$_{it}$	*12.486*	*13.672*	*12.929*	*13.530*	*13.567*	*13.061*
	(0.820)	*(0.993)*	*(1.077)*	*(1.033)*	*(1.020)*	*(1.096)*
(Sales Growth)$_{it}$	*0.114*	*0.142*	*-0.006*	*0.189*	*0.096*	*0.233*
	(0.430)	*(0.421)*	*(0.483)*	*(0.383)*	*(0.361)*	*(0.530)*
(Subsidies)$_{it}$	*0.069*	*0.076*	*0.131*	*0.053*	*0.078*	*0.068*
	(0.206)	*(0.208)*	*(0.336)*	*(0.124)*	*(0.220)*	*(0.188)*
(Risk)$_{it}$	*0.378*	*0.378*	*0.429*	*0.355*	*0.311*	*0.462*
	(0.243)	*(0.253)*	*(0.274)*	*(0.234)*	*(0.210)*	*(0.269)*
Sample size	*885*	*2783*	*885*	*2783*	*2313*	*1437*

The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript i denotes firms and the subscript t denotes time where t=1995-2004. Columns 1 and 2 show the summary statistics of Chinese firms listed according to financial constraints. Firms are classified as *SMALL* if their assets are in the bottom quartile and *LARGE* if the assets are in the top quartile of the distribution of real assets of all-firm years. Columns 3 and 4 give the summary statistics of firms according to the (internal) financial constraints. Firms are classified as *LOW PROFIT* if their profit is in the bottom quartile of the distribution of profits of all firm-years and *HIGH PROFIT* if their profitability is in the top 3 quartiles of the distribution of profits of all-firm years. Also see notes to Table 6.1. In columns 5 and 6, we show the summary statistics of firms according to a sample split based on the year that China joined the WTO. Column 3 gives the summary statistics in the *pre WTO* years (ie before China joined the WTO) while column 4 gives the summary statistics of *post WTO* firm-years (ie after China joined the WTO).

TABLE 6.3:FIRST DIFFERENCE GMM ESTIMATOR

	(1)	(2)	(3)	(4)	(5)	(6)
$(\Delta Cash\ Holdings/N.Assets)_{it-1}$	-0.133***	-0.129***	-0.220***	-0.119***	-0.116***	-0.113***
	0.032	0.032	0.052	0.042	0.041	0.039
$(Profit/Net\ Assets)_{it}$	0.182	0.072	0.443	-0.460	-0.383	-0.528
	0.407	0.359	0.508	0.574	0.492	0.574
$(\Delta NWC/Net\ Assets)_{it}$	-0.317***	-0.344***	-0.289**	-0.405***	-0.414***	-0.415**
	0.116	0.111	0.150	0.157	0.154	0.172
$(\Delta Leverage/Net\ Assets)_{it}$	-0.738***	-0.622***	-0.539***	-0.247	-0.132	-0.309
	0.203	0.183	0.246	0.306	0.283	0.281
$(Investment/Net\ Assets)_{it}$	-0.450***	-0.464***	-0.232	-0.495	-0.584**	-0.553**
	0.181	0.170	0.247	0.316	0.310	0.298
$(Log\ Sales)_{it}$	0.135***	0.108***	-0.028	0.376***	0.349***	0.318***
	0.063	0.061	0.069	0.117	0.109	0.113
$(Sales\ Growth)_{it}$	-0.035	-0.059*	-0.037	-0.095	-0.102	-0.116*
	0.038	0.036	0.036	0.077	0.068	0.071
$(Subsidies)_{it}$		0.013	-0.030		0.055	0.088
		0.054	0.053		0.101	0.114
$(Risk)_{it}$			0.052			
			0.093			
Sample size	1357	1357	515	979	979	979
J	0.503	0.261	0.567	0.440	0.227	0.436
m2	0.277	0.192	0.220	0.618	0.554	0.995

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(Cash\ Holdings/N.Assets)_{it,}$ $(Profit/NetAssets)_{it,}$ $(\Delta NWC)_{it,}$ $(\Delta Leverage)_{it,}$ $(Investment)_{it,}$ $(Log\ Sales)_{it,}$ $(Sales\ Growth)_{it}$ and $(Subsidies)_{it}$ and $(Risk)_{it}$ in alternative specifications all lagged two to five times. In column 2, we include the subsidies variable in our regression specification. In Column 3, we include a risk measure to account for any uncertainty that these firms might face over the period considered. In column 4 we use the same specification as in column 1 while in column 5 we use the same specification as in column 2 where we include the subsidy variable in the specification. In column 6, we use the same specification as in column 1 but we use a cash flow measure (as used by Almeida et al, 2004) instead of profits. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 6.1 and 6.2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

TABLE 6.4: ACCOUNTING FOR FINANCIAL CONSTRAINTS AND WTO ACCESSION

	1 FINANCIAL CONSTRAINTS MEASURED BY REAL ASSETS	*2 FINANCIAL CONSTRAINTS MEASURED BY PROFITABILITY*	*2 WTO EFFECT*
$(\Delta Cash\ Holdings/Net\ Assets)_{it-1} * Dummy1_{it}$	-0.166	-0.180	-0.914***
	(0.135)	(0.175)	(0.136)
$(\Delta Cash\ Holdings\ /Net\ Assets)_{it-1} * Dummy2_{it}$	-0.119***	-0.122***	-0.735***
	(0.057)	(0.039)	(0.050)
$(Profit/Net\ Assets)_{it} * Dummy1_{it}$	-0.450	-0.245	0.384
	(0.596)	(0.431)	(0.300)
$(Profit/Net\ Assets)_{it} * Dummy2_{it}$	0.325	0.053	0.643***
	(0.370)	(0.564)	(0.171)
$(\Delta NWC)_{it} * Dummy1_{it}$	-0.107	-0.080	-0.045
	(0.229)	(0.226	(0.115)
$(\Delta NWC)_{it} * Dummy2_{it}$	-0.505***	-0.389***	-0.217***
	(0.153)	(0.125	(0.073)
$(\Delta Leverage)_{it} * Dummy1_{it}$	-0.410	-0.204	-0.585***
	(0.424)	(0.294	(0.272)
$(\Delta Leverage)_{it} * Dummy2_{it}$	-0.523***	-0.594***	-0.093
	(0.197)	(0.183	(0.110)
$(Investment)_{it} * Dummy1_{it}$	-0.572*	-0.559**	0.163
	(0.356)	(0.270)	(0.166)
$(Investment)_{it} * Dummy2_{it}$	-0.549***	-0.535***	-0.140
	(0.223)	(0.211)	(0.115)
$(Log\ Sales)_{it} * Dummy1_{it}$	0.081	0.136***	0.034
	(0.064)	(0.057)	(0.030)
$(Log\ Sales)_{it} * Dummy2_{it}$	0.076	0.136***	0.029
	(0.062)	(0.059)	(0.031)
$(Sales\ Growth)_{it} * Dummy1_{it}$	-0.039	-0.123***	0.003
	(0.052)	(0.055)	(0.023)
$(Sales\ Growth)_{it} * Dummy2_{it}$	-0.027	0.005	-0.050**
	(0.034)	(0.040)	(0.025)
$(Subsidies)_{it} * Dummy1_{it}$	-0.029	0.009	-0.041
	(0.132)	(0.050)	(0.040
$(Subsidies)_{it} * Dummy2_{it}$	0.008	-0.044	-0.03
	(0.061)	(0.138)	(0.034)
Sample size	1357	1357	1730
J	0.187	0.340	0.618
m2	0.247	0.083	0.020

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. In Column (1) we investigate if financial constraints captured by the distribution of real assets affects the cash holdings of the listed Chinese firms in our sample; Dummy1 stands for SMALL while Dummy2 stands for LARGE. Instruments used in column 1 are $(\Delta Cash\ Holdings/Net\ Assets)_{it,}$ $(Profit/Assets)_{it,}$ $(\Delta NWC)_{it,}$ $(\Delta Leverage)_{it}$,$(Investment)_{it}$,$(Log\ Sales)_{it,}$ and $(Sales\ Growth)_{it}$ lagged two to three times and interacted with dummies: SMALL and LARGE based on the distribution of their real assets. In Column (2) we investigate if the level of profitability of firms affects the cash holdings of the listed Chinese firms in our sample; Dummy1 stands for LOWPROFIT while Dummy2 stands for HIGHPROFIT. Instruments used in column (2) are $(\Delta Cash\ Holdings/Net\ Assets)_{it,}$ $(Profit/Assets)_{it,}$ $(\Delta NWC)_{it,}$ $(\Delta Leverage)_{it}$,$(Investment)_{it}$,$(Log\ Sales)_{it,}$ and $(Sales\ Growth)_{it}$ lagged two to three times and interacted with dummies: *LOW PROFIT* and *HIGH PROFIT*, based on the distribution of their profits. In Column (3) we investigate if WTO accession affected the cash holdings of the listed Chinese firms in our sample; Dummy1 stands for PREWTO while Dummy2 stands for POSTWTO. Instruments used in column (3) are $(\Delta Cash\ Holdings/Net\ Assets)_{it,}$ $(Profit/Assets)_{it,}$ $(\Delta NWC)_{it,}$ $(\Delta Leverage)_{it}$,$(Investment)_{it}$,$(Log\ Sales)_{it,}$ and $(Sales\ Growth)_{it}$ lagged two to three times and interacted with dummies: *PRE WTO* and *POST WTO*. Time dummies are included in all specifications as regressors and instruments. Also see notes to Table 6.1, 6.2 and 6.4.. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

TABLE 6.5: ACCOUNTING JOINTLY FOR FINANCIAL CONSTRAINTS AND WTO ACCESSION	
$(\Delta$Cash Holdings/Net Assets$)_{it-1}$*PREWTO	-0.009
	(0.127)
$(\Delta$Cash Holdings /Net Assets$)_{it-1}$*POSTWTO	-0.753
	(0.050)
$(Profit/Net\ Assets)_{it}$ *PREWTO* $LOWPROFIT_{it}$	-0.248
	(0.525)
$(Profit/Net\ Assets)_{it}$ *PREWTO* $HIGHPROFIT_{it}$	0.436
	(0.298)
$(Profit/Net\ Assets)_{it}$ *POSTWTO* $LOWPROFIT_{it}$	0.402**
	(0.204)
$(Profit/Net\ Assets)_{it}$ * POSTWTO* $HIGHPROFIT_{it}$	0.967***
	(0.288)
$(\Delta NWC)_{it}$ *PREWTO	-0.069
	(0.101)
$(\Delta NWC)_{it}$ * POSTWTO	-0.217***
	(0.068)
$(\Delta Leverage)_{it}$ * PREWTO	-0.608***
	(0.276)
$(\Delta Leverage)_{it}$ * POSTWTO	-0.081
	(0.104)
$(Investment)_{it}$ * PREWTO	0.187
	(0.163)
$(Investment)_{it}$ * POSTWTO	-0.122
	(0.113)
$(Log\ Sales)_{it}$ * PREWTO	0.030
	(0.031)
$(Log\ Sales)_{it}$ * POSTWTO	0.022
	(0.032)
$(Sales\ Growth)_{it}$ * PREWTO	0.014
	(0.020)
$(Sales\ Growth)_{it}$ *POSTWTO	-0.036
	(0.024)
$(Subsidies)_{it}$ * PREWTO	-0.016
	(0.036)
$(Subsidies)_{it}$ * POSTWTO	-0.008
	(0.032)
Sample size	1730
J	0.713
m2	0.013

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(Cash\ Holdings/N.Assets)_{it,}$ $(Profit/NetAssets)_{it,}$ $(\Delta NWC)_{it,}$ $(\Delta Leverage)_{it,}$ $(Investment)_{it,}$ $(Log\ Sales)_{it,}$ $(Sales\ Growth)_{it}$ and

(Subsidies)$_{it}$ all lagged two to three times and interacted with dummies: *PRE WTO* and *POST WTO*. The *Profit* term is interacted with both the *pre-WTO* and *post-WTO* dummies and also *High Profit* and *Low Profit* dummies to investigate if the nature of financial constraints have changed after China joined the WTO. Time dummies are included in all specifications as regressors and instruments. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

TABLE 6.6: ACCOUNTING JOINTLY FOR FINANCIAL CONSTRAINTS AND WTO ACCESSION ROBUSTNESS CHECK	
$(\Delta$Cash Holdings/Net Assets$)_{it-1}$*PREWTO	-0.913
	(0.123)
$(\Delta$Cash Holdings /Net Assets$)_{it-1}$*POSTWTO	-0.753
	(0.047)
$(Profit/Net\ Assets)_{it}$ *PREWTO* $SMALL_{it}$	-0.075
	(0.366)
$(Profit/Net\ Assets)_{it}$ *PREWTO* $LARGE_{it}$	0.739***
	(0.316)
$(Profit/Net\ Assets)_{it}$ *POSTWTO* $SMALL_{it}$	0.881**
	(0.318)
$(Profit/Net\ Assets)_{it}$ * POSTWTO* $LARGE_{it}$	0.671***
	(0.197)
$(\Delta NWC)_{it}$ *PREWTO	-0.127
	(0.121)
$(\Delta NWC)_{it}$ * POSTWTO	-0.226***
	(0.067)
$(\Delta Leverage)_{it}$ * PREWTO	-0.497***
	(0.228)
$(\Delta Leverage)_{it}$ * POSTWTO	-0.095
	(0.105)
$(Investment)_{it}$ * PREWTO	0.007
	(0.161)
$(Investment)_{it}$ * POSTWTO	-0.149
	(0.114)
$(Log\ Sales)_{it}$ * PREWTO	0.007
	(0.161)
$(Log\ Sales)_{it}$ * POSTWTO	0.012
	(0.032)
$(Sales\ Growth)_{it}$ * PREWTO	0.008
	(0.022)
$(Sales\ Growth)_{it}$ *POSTWTO	-0.037
	(0.024)
$(Subsidies)_{it}$ * PREWTO	-0.056
	(0.042)
$(Subsidies)_{it}$ * POSTWTO	-0.023
	(0.032)
Sample size	1730
J	0.625
m2	0.022

Notes: We report asymptotic standard errors in parentheses. m2 is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used are $(Cash\ Holdings/N.Assets)_{it,}$

$(Profit/NetAssets)_{it}$, $(\Delta NWC)_{it}$, $(\Delta Leverage)_{it}$, $(Investment)_{it}$, $(Log\ Sales)_{it}$, $(Sales\ Growth)_{it}$ and $(Subsidies)_{it}$ all lagged two to three times and interacted with dummies: *PRE WTO* and *POST WTO*. The *Profit* term is interacted with both the *PREWTO* and *POSTWTO* dummies and also *SMALL* and *LARGE* dummies to investigate if the nature of financial constraints have changed after China joined the WTO. Time dummies are included in all specifications as regressors and instruments. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

CHAPTER 7

CONCLUSION

Previous studies on capital structure have mainly examined the determinants of debt or focused on the debt-equity mix choice of firms. At the same time, papers that have taken into account financial constraints faced by firms have mainly examined investment-cash flow sensitivities. In the first part of this study, we merge these two different strands of literature and try to examine how financial constraints affect the leverage decisions of firms. In particular, in the first part of this study, as the main innovative aspect, we examine how financial constraints affect the relationship between leverage and cash flow of firms in the UK. We focus on the relationship between leverage and cash flow for the simple reason that these are the two main sources of finance of firms even in countries where the stock market is very developed.

In the second part of this study we focus on the financing behaviour of listed Chinese firms. The reason why we study Chinese firms is that it provides a fresh approach as not much research has been done on the financing behaviour of Chinese firms. We find that listed Chinese firms have low leverage and high cash holdings. This gives evidence that Chinese firms are quite financially conservative.

7.1 SUMMARY OF FINDINGS

In Chapter 2, we review both the theoretical and empirical studies that have tried to investigate the capital structure decisions of firms. In the first part of the chapter we mainly focus on the capital structure decisions of large, listed firms. In the theoretical part, we discuss theories on capital structure based on tax-based, agency cost, and asymmetric information theories. However, we mainly focus on the Trade off Theory (TOT) and the Pecking Order Theory (POT). In the empirical section we survey some recent empirical studies, which suggest that financing decisions across a number of countries are quite similar although there might be important institutional differences among countries. For instance, the studies mainly show that firms that have more internal finance have lower leverage. In the second part of the study we

concentrate on the theoretical and empirical literature of small and medium-sized firms (SMEs) that is, firms that cannot issue shares on stock markets.

In Chapter 3, we examine the leverage decisions of quoted firms in the UK. We merge two different strands of literature and try to examine how financial constraints affect the leverage decisions of firms. In particular, our main innovative aspect is our investigation of how financial constraints affect the relationship between leverage and cash flow. First, we establish the fact that firms indeed follow a hierarchy when they decide what sources of finance they use. We find that there is a negative relationship between leverage and cash flow indicating that when a firm experiences cash flow innovations, it tends to reduce the amount of leverage in its capital structure. This result suggests that firms always prefer to use internal finance when it is available and also points towards a debt conservatism approach of firms that has clearly been observed in the last two decades. Other factors that affect leverage in our study are the size of firms, their investment and their growth opportunities.

In Part I of Chapter 3, we consider overall financial constraints, that is, we take into account factors like real assets, coverage ratios and level of indebtedness to determine the extent to which a firm is likely to face financial constraints. These are mainly factors that outsiders would look at to determine whether a firm appears to be financially constrained or unconstrained and whether they would be willing to lend to that firm or not. Similar to the results obtained by Almeida and Campello (2005) who study firms in the US, we find that for firms in the UK the sensitivity of debt to variations in internal funds is less negative for constrained firms than for unconstrained firms. Overall, the results we obtain suggest that firms in the UK are financially conservative. We find that even listed firms who have the broadest menu of financing choices actually chose from a few sources of finance, and among them internally generated funds and debt are the most important sources.

In Part II of Chapter 3 we examine the financing of small and medium size enterprises (SMEs) in the UK, as these firms are more likely to suffer from financial constraints than the quoted firms. We examine the relationship between firm leverage and cash flow at unquoted firms since these are the two most important sources of finance of most firms. Our results suggest that the relationship between debt and cash flow can be better explained by the POT. Cash flow is a vital source of financing of firms and they seem to follow a financial hierarchy when deciding what sources of

finance to use. If firms experience an increase in cash flow, they tend to reduce the amount of debt they hold, possibly by paying off debt but if cash flow falls firms would increase leverage in their capital structure.

Unlike the previous section, we further investigate this negative relationship by taking into account both internal and overall financial constraints. If the pecking order theory is true then the main factor that would influence whether a firm would go for external finance is the availability of internal finance. For instance, if a firm had sufficient funds then it would choose not to have recourse to external finance and would use its internal funds. In this case, overall financial constraints would be irrelevant for the firm. If a firm is internally financially constrained and needs external funding, then obviously overall financial constraints become very important. We introduce internal financial constraints measured by the availability of internal finance to the firms.

Our results suggest that internal financial constraints are the main factors that influence the amount of debt that a firm has in its capital structure. Even if firms have negative cash flows they do not increase their leverage, although these firms are likely to be more debt dependent. The results obtained when firms are distinguished according to the level of overall financial constraints that they face, seem to suggest that however large a firm might be and however easy it is for a firm to have access to debt, firms inherently do not like to increase debt in their capital structure. The crux of the problem is then whether managers want to go for external financing. Our results seem to indicate that these firms prefer to pay back debt when they experience an increase in their cash flows rather than borrowing more, say to invest. They prefer to have less debt when they have negative or low cash flows, possibly to avoid the risk of bankruptcy.

In the second part of this study we focus on the financing decisions of Chinese firms. In Chapter 4 we review the Chinese economy. China is an interesting case study, especially since the Chinese miracle has become a phenomenon in itself. We first discuss the transition and reform process in China. Then we discuss finance and growth in the Chinese context and provide a detailed description of the Chinese financial system where we focus mainly on the development of the banking sector and the stock market. We also discuss the importance of foreign direct investment as this is the factor that has received a lot of attention especially in the Chinese case and has obviously played a role in the high economic growth that has been achieved. We then

review some studies that have examined the leverage decisions of firms in China. After this we focus on the literature on cash holdings and review some studies.

In chapter 5 we investigate the leverage decisions of listed manufacturing firms in China. The reason for doing this is that we believe that this would provide an interesting comparison and would shed some light on how the firms in one of the fastest growing economy of the world, namely China, finance themselves. We find that most of the debt of Chinese firms is short-term, suggesting that maturity matching might be a problem, and that banks prefer to lend short-term, which points towards a risk averse behaviour of the latter. Our results suggest that despite declining profitability, our listed Chinese firms are still able to service debt. This could possibly explain why banks are still willing to lend to them or points towards the fact that despite substantial financial reforms, Chinese firms still benefit from soft budget constraints.

We investigate if financing behaviour differs across regions as markets in China are usually cited as being fragmented. Huge development gaps exist between the Eastern and Western regions and this could possibly affect the financing patterns across regions. We do not find evidence to support this claim, as firms operating in different regions appear to have similar levels of leverage. However, these results should be interpreted cautiously as we are here focussing solely on the behaviour of listed manufacturing firms which are typically large firms and are a tiny sample out of the population of Chinese firms who are likely to be more dynamic than the firms we have considered in our study.

Next, we consider firms located in High and Low FDI recipient provinces. After the US, China is the second major FDI recipient country[76]. It is a fact that FDI has played a significant role in the growth miracle achieved by China. We hence investigate the effect of FDI on leverage decisions by taking into account FDI across various provinces. The results we obtain suggest that the leverage decisions of firms located in High FDI provinces are not influenced by their profitability, while profitability is an important determinant of the leverage decisions of firms located in low FDI provinces. We also find evidence suggesting that the level of subsidies obtained by firms influences the leverage decisions of firms. Finally, we explore the time dimension in our dataset by considering whether joining WTO in 2001 has had

[76] It is predicted that China will overtake the US in the coming years and will thus become the number one destination for FDI.

any effect on the leverage decisions of the firms in our sample. We do not find any significant differences in the financing patterns of firms before or after this event.

Our results suggest that the single main determinant of leverage decisions of Chinese firms is the profitability of these firms. Profitability is significant across the full sample and even when the sample is split according to the various geographical attributes. It is also significant when the sample is split in the year 2001. Profitability is only insignificant for high FDI regions and high subsidy firm-years indicating that profit is not an important determinant of leverage for firms located in high FDI provinces or for firms that receive high subsidies. Unlike other factors such as size or collateral that are significant in only a few cases, profitability is mostly negative and significant, suggesting that Chinese firms do operate according to a pecking order and that their preferred source of finance is internal finance. In this respect, Chinese listed firms are therefore not very different from their western counterparts after all.

In Chapter 6, we study the cash holding decisions of listed Chinese manufacturing firms. The main motivation for this is the very high savings rate observed among Chinese firms especially in the years preceding China joining the WTO. We examine if factors that affect cash holdings in other parts of the world also affect the cash holdings of firms in China. Our results suggest that some of the determinants of cash holdings in other parts of the world (especially the US) also affect the cash holdings of Chinese firms. Second we distinguish among financially constrained and unconstrained firms using a number of criteria. The results suggest that Chinese firms do not save out of their profits. We explain this result through the lack of variation in firm characteristics of listed Chinese firms. Third, we investigate if WTO accession has changed firm behaviour especially in the case of cash savings. We find that firms save out of their profits post-WTO, but it is not clear where the high cash savings in the pre-WTO years were coming from.

Overall the results suggest that the factors that mainly affect the cash holdings of listed Chinese firms are changes in net working capital (current assets minus current liabilities minus cash holdings) and changes in leverage. These two variables are negatively related to changes in cash holdings and suggest that firms only increase their cash holdings when net working capital decreases or the amount of leverage falls.

7.2 SYNTHESIS

Table 7.1 below shows a comparison of firms examined in this study. As mentioned previously, we have mainly focussed on firms in the manufacturing. This allows us to directly compare our findings across the cross section of the firms used in this study and draw some general conclusion. Column *(1)* shows the summary statistics for listed firms in the UK, that is, those firms that are able to issue public equity. Column *(2)* shows the summary statistics of unquoted firms in the UK that consist of small and medium-sized firms. Column *(3)* presents the summary statistics for listed Chinese firms.

When considering the overall leverage (sum of short-term and long-term debt) of the 3 different classes of firms, it is apparent that the unquoted UK firms are the most levered ones, giving evidence that these unlisted firms are more reliant on debt as a source of finance. We can therefore conclude that firms that are restricted in their sources of financing and cannot issue shares are more dependent on debt. Furthermore, the main source of leverage of these unquoted UK firms is mainly bank debt. When we compare the leverage of listed UK firms and listed Chinese firms, we find that the listed Chinese firms are more highly levered than the listed UK firms. The reason could be that listed UK firms issue comparatively more equity than listed Chinese firms or that Chinese firms are much more financially conservative than firms in the UK. In fact, Chinese firms face quite a number of restrictions in issuing shares and thus they might have to rely more on leverage.

The UK stock market is quite mature as it has been quite a number of years since its establishment. It has been documented in the recent literature that most activities on the stock markets especially in the UK and the US have been aimed at share buy-back or repurchase activities. Firms have also tended towards reducing their leverage levels and have mainly concentrated on the accumulation of cash in their businesses. The equity issues of both UK and Chinese listed firms have been quite minimal. For UK firms equity issues have at most been 3% of assets. For Chinese firms this is smaller at around 0.1% of assets (author's calculations from available datasets). This suggest that the single most important mean of raising finance could be regarded as being the initial public offering (IPO) event. Once this event has occurred the additional equity issues of firms namely in the form of rights issues are quite rare and minimal.

Table 7.1 shows that unquoted firms have higher long-term debt than listed firms in the UK and China. As mentioned above, the reason for this is that these firms are restricted in their financing options. An interesting fact is that listed Chinese firms have been known to have low long-term leverage. However as can be seen, listed UK firms also have the same level of long-term debt. This suggests that there is nothing surprising in listed Chinese firms having around 5% of long-term debt relative to their assets. What is significant is that while the debt structure of listed UK firms is more "balanced", that is they have quite similar levels of long-term and short-term debt, the debt structure of listed Chinese firms is excessively tilted towards short-term debt. The Chinese firms in our sample have around 5% long-term debt ratio but short-term debt is almost 17% of assets. This suggests that there are some problems in the Chinese corporate sector. It could possibly indicate that either Chinese firms are more willing to borrow short-term rather than long-term or the fact that banks (who give out the major portion of debt) are more willing to lend short-term rather than long-term. It is not very clear whether this reflects a supply or demand effect. However, what is clear from this is that there are macroeconomic uncertainties in terms of both monetary and fiscal policy and in this environment of uncertainty, firms and banks do not want to take risks lending/borrowing long-term.

Listed firms in the UK have higher cash flow over assets than unquoted firms. Unfortunately, we do not have data on the cash flow of Chinese firms for the complete period[77]. Regarding profitability, we see that listed UK firms are more profitable followed by unquoted ones and the least profitable ones are the listed Chinese firms. Concerning the cash stock variable that measures the total amount of internal funds, we find that Chinese firms hold almost twice as much cash as listed firms in the UK. This could possibly be reflecting the attitude of Chinese firms towards business. They do not want high levels of debt and prefer to save. Chinese manufacturing firms have the highest amount of sales followed by the unquoted firms in the UK and finally the quoted firms. The amount of collateral of the firms measured by the level of tangible assets to total assets is similar across all the firms but Chinese firms have the lowest amount of collateral.

[77]Listed Chinese firms started reporting their cash flows only in 1998. Although cash flows for earlier years can be calculated, we do not have the complete data required to be able to do this.

7.2.1 COMPARISION OF RESULTS

The regression that we use to examine leverage decisions of firms in the UK and China is the one used by Rajan and Zingales (1995) as shown below:

$$(Leverage/Assets)_{it} = \lambda_0 + \lambda_1 (Leverage/Assets)_{it-1} + \lambda_2 (Return\ on\ Assets)_{it} + \lambda_3 (Log\ Sales)_{it} + \lambda_4 (Tangible\ assets)_{it} + \lambda_5 (Tobin's\ Q)_{it} + \lambda_6 (Tax)_{it} + v_i + v_t + \varepsilon_{it} \quad (7.1)$$

Return on Assets is proxied by profitability. *Log Sales* is the log of real sales used as a proxy of size. *Tangible assets* is used as a measure of collateral and proxied for by the ratio of net fixed assets to total assets[78]. Tobin's Q is used as a measure of growth opportunies. Unfortunately, the sub-sample of data that we have for the unquoted UK firms and the listed Chinese firm, does not contain the market price of shares and therefore we cannot calculate Tobin's Q as a measure of growth opportunities. We therefore have to rely on a *Sales Growth* measure to capture growth opportunities[79]. Since we use panel data, we include both a firm specific and time specific error term. Hence, the error term now consists of three components: v_i is a firm-specific fixed effect that controls for unobserved time-invariant characteristics, ν_t represents a time specific component and reflects aggregate effects common across companies to control for macroeconomic influences, including factors as nominal interest rates and inflation, ε_{it} is an idiosyncratic error term.

The variables included in the regression are not marked in stone. Since there is no specific theory that tells us what variables should be included in a regression to determine the leverage decisions of firms, researchers have included variables which they believe influenced the leverage decisions of firms. These studies include for instance Fama and French (2002), Frank and Goyal (2002), Benito (2003), although they do not specifically follow RZ (1995) specification but rather use its modified version and one that was more suited to their research purposes.

Table 7.2 shows the regression results for all the firms (quoted UK firms, UK SMEs and listed Chinese firms) which are estimated using the Arellano and Bond (1991) GMM estimator. The coefficient on the lagged dependent variable indicates

[78] It should be noted that in the case of quoted UK firms in Chapter 3, we use an investment measure rather than a collateral measure. We cannot include both as they are highly correlated. In the case of the Chinese firms we exclude the tax measure as it is insignificant in most cases and by including it we would reduce the number of degrees of freedom.

[79] Hence we replace the Tobin's Q measure in the regression with a Sales Growth measure to capture growth opportunities for unquoted UK firms and listed Chinese firms.

that adjustment level is quite similar across firms in most cases; the estimated parameter associated with the lagged leverage ($\alpha=(1-\lambda)_{it}$) is 0.429 for listed UK firms, 0.486 for unquoted UK firms and 0.402 for listed Chinese firms[80]. This indicates that the adjustment parameter for the different firms is as follows: 0.571 for listed UK firms, 0.514 for SMEs in the UK and 0.598 for listed Chinese firms[81]. The value of the adjustment parameter indicates that the adjustment level is quite similar across firms in most cases, with Chinese firms closing the gap between their actual debt and target leverage more quickly, followed by listed UK firms and SMEs.

The results indicate that Chinese firms possibly adjust to their target leverage more quickly maybe because the costs of being away from the target are high and the transaction costs of adjusting to the target are not very high. Listed firms adjust to their target leverage quite quickly too, possibly because they are able to do so, while SMEs in the UK are the slowest to adjust to their targets probably because their adjustments costs are prohibitive.

There is a negative relationship between leverage and cash flow that is according to the POT, and suggests that when firms experience an increase in cash flow, they tend to reduce the amount of leverage in their capital structure. It also suggests that when cash flow falls, firms tend to increase their reliance on leverage, suggesting that cash flow and leverage are substitute sources of finance. The magnitude of the negative coefficients are as follows: 0.527 for listed UK firms, 0.425 for listed Chinese firms and 0.259 for the SMEs in the UK. The magnitude of the negative coefficients suggest that when faced with positive cash flow innovations, listed UK firms are able to reduce their debt by a larger amount followed by listed Chinese firms and finally, the SMEs in the UK.

These results suggest that the relationship between leverage and internal finance (measured by cash flow for listed and SMEs firms in the UK and profit for the listed Chinese firms) is better explained by the pecking order theory rather than the trade-off theory. It also gives some support to the model proposed by Almeida and Campello (2005), who show that faced with positive cash flow innovations, unconstrained firms are able to reduce their leverage by a larger amount than

[80] This adjustment parameter is emphasized in the Trade off Theory where firms adjust to a target level of debt every year. Hence if firms are away from their target leverage, they tend to close the gap between target and actual leverage over a certain number of years.

[81] These adjustment parameters are calculated as one minus the coefficient associated with the lagged dependent variable.

constrained firms. This is reflected in our results which suggest that listed UK firms are able to reduce their leverage by a larger amount than listed Chinese firms or SMEs in the UK.

The firms in our study can be ranked upon their degree of financial constraints. Listed UK firms are possibly the least constrained firms among the lot. They have high cash flow and operate in a well-developed financial system. After them, listed Chinese firms come in the second place possibly because they operate in a lesser developed financial system; but they are ranked second because being listed they can issue equity and they are quite well-known which could also help them get access to loans when they are needed. Lastly, come the SMEs in the UK. SMEs are restricted in their financing sources, they can only use internal finance or other forms of leverage. Although listed firms do not use equity financing a lot as shown in the previous chapters, the results indicate that being listed does influence the constraints that firms face. Being listed possibly relaxes overall constraints as lenders are more willing to lend to listed firms as these firms have reputation value.

We find that there is a positive relationship between size (measured by the log of sales) and leverage for listed UK (coefficient of 0.024) and Chinese firms (coefficient of 0.023), which is in accordance with the TOT, which postulates that larger firms normally take more leverage. However, in the case of the UK SMEs we find that there is a negative relationship between size and leverage suggesting that when firms grow in size, they tend to reduce their leverage. This can possibly be explained by the fact that SMEs tend to rely on external funds, usually loans when they have to grow but after a while the larger they grow in size, they pay back their debt and reduce their leverage.

In the case of listed UK firms we look at the relationship between leverage and investment because we closely follow the Almeida and Campello (2005) model. However, because there are a number of problems with using the investment measure such missing values; in the case of SMEs and listed Chinese firms we use a collateral measure. Collateral is likely to be positively correlated with the investment variable as we measure collateral as the ratio of tangible assets to total assets and normally investments adds to a firm's stock of tangible assets. For listed UK firms we find a positive relationship between investment and leverage that suggest that the more a firm invests the more levered it is.

These results indicate that although similar factors affect the financing of firms in both the UK and China, these factors do not always affect financing in the same way. The amount of internal finance is always negatively related to leverage indicating that firms across these two countries follow some kind of pecking order in their financing. However firms in these countries also behave in a very individualistic way. The factors that affect (or do not affect) the financing of Chinese firms for instance reflect the environment in which they are operating. For instance, since collateral does not influence their leverage, this indicates that they operate in a financial system where they are highly favoured. The fact that size is positively related to leverage for listed firms in both countries but negatively related to the leverage of SMEs indicates that SMEs are perhaps the most financially conservative firms among the lot. However, this financial conservatism is not only restricted to SMEs. In all the firms that we investigated, the fact that an increase in internal financing always led to a decrease in leverage even when we took into account financial constraints indicates that financial conservatism is an important aspect that needs to be accounted for when investigating financing decisions of firms.

7.3 POLICY IMPLICATIONS

This research has been mainly based on the factors that affect the financing decisions of firms. It is mainly focussed on the demand side of finance, that is, we concentrate on the factors that influence the demand for external funds of firms mainly in the form leverage. We take into account firm-specific characteristics while studying the behaviour of firms which could possibly help in policy implementation. Our findings suggest that firms attach a lot of importance to internal funds. In the case of large firms we find that although these firms can easily have access to external funds, they tend to reduce their reliance on outside funds whenever they have the opportunity to do so. We find similar behaviour across small and constrained firms.

All of this implies a major reliance of firms, especially unquoted ones, on cash flow. Hence these firms might be constricting their performance according to their cash flows. This has important implications on growth as it suggests that if these firms had been less debt averse (both when cash flows are negative or positive) perhaps they could grow more. This is problematic as we expect that smaller firms would require more funds to grow and this tendency to reduce leverage would not be very strong among smaller firms. This suggests that policy makers should take this

inherent debt-averse behaviour of small and medium-sized firms when taking policy decisions. It is useless to make credit widely available if firms are themselves not willing to take the leverage. Another policy implication of this is that even if credit is widely available, firms are unwilling to undertake leverage as the terms on which credit is being made available to them, do not suit them. Hence, the terms of credit possibly need to be reviewed.

In the case of Chinese firms other policy implications can be derived. The fact that Chinese firms are both risk-averse and are sitting on huge stockpiles of cash suggest that these firms are accumulating resources and these resources are not being used for investment purposes. This behaviour could be explained by the uncertainty that exists. The Chinese government is probably not sending the correct signals. Therefore to eliminate any nasty surprises such as hikes in interest rates due to the decision of the Chinese government to tighten monetary policy, firms decide to play it safe and accumulate resources. Obviously this has serious implications for growth in the Chinese economy. The government has to come with measures that would positively affect confidence level in the economy together with other legal and financial reforms.

7.4 FUTURE RESEARCH

This study has been mainly based on the leverage decisions of firms in the UK and China. For the purpose of this study and for the sake of simplicity we have focussed on a single measure of leverage that is the sum of short-term and long-term debt. Obviously factors that affect short-term debt and factors that affect long-term debt might be different. For instance cash flow is a major determinant of short-term debt while long-term debt is more likely to be influenced by collateral. For the sake of consistency and brevity we have not distinguished between the various components of leverage but this is obviously one of the limitations of this study and could be examined in more detail in future research.

In our study we identify the factors that affect the cash holdings of listed Chinese manufacturing firms. However we are not able to identify where these massive amounts of cash are being generated from. This still remains a mystery and could be another potential area of future research. Particular attention could also be aimed at examining the equity issuance behaviour of these firms starting from the

initial public offering and examining how this has affected the cash holdings of these firms. However to be able to do this, pre-issuance data is required as unfortunately the data that we have is only post-issuance data.

In this study we have mainly examined the financing behaviour of manufacturing firms. We examine the leverage decisions of listed manufacturing firms in the UK, SMEs in the UK that operate in manufacturing sector and listed Chinese manufacturing firms. It might be interesting to extend this analysis to other sectors of the economy. In the case of China, we compared the financing behaviour of firms with firms in the UK. However, a more interesting study would involve comparing firms in China and India as these are the two countries that are likely to be occupying the centre-stage for the next few decades.

7.5 APPENDIX

Table 7.1: SUMMARY STATISTICS

	Listed UK firms	***Unquoted UK firms***	***Listed Chinese Firms***
	DATASTREAM	*FAME*	*CSMAR*
	(1)	*(2)*	*(3)*
$(LEV / A)_{it}$	*0.146*	*0.330*	*0.216*
	(0.100)	*(0.206)*	*(0.126)*
$(LTD / A)_{it}$	*0.069*	*0.150*	*0.049*
	(0.071)	*(0.162)*	*(0.064)*
$(STD / A)_{it}$	*0.077*	*0.208*	*0.167*
	(0.071)	*(0.202)*	*(0.110)*
$(Cash\ Flow)_{it}$	*0.132*	*0.117*	---
	(0.070)	*(0.112)*	
(PROFIT/A)	*0.093*	*0.051*	*0.031*
	(0.067)	*(0.086)*	*(0.052)*
$(Cash\ Stock)_{it}$	*0.069*		*0.146*
	(0.086)		*(0.143)*
$(Log\ Sales)_{it}$	*6.659*	*8.978*	*13.300*
	(1.526)	*(1.177)*	*(1.115)*
(Investment/A)	*0.040*	--	--
	(0.043)		
$(STRUC/A)_{it}$	*0.320*	*0.300*	*0.292*
	(0.128)	*(0.192)*	(0.128)
Q	*2.817*		
	(2.492)		
$(SalesG)_{it}$		*0.077*	*0.147*
		(0.318)	*(0.470)*
$(Tax)_{it}$	*0.415*	*0.341*	---
	(0.242)	*(0.428)*	
Sample Size	*11761*	*80718*	*3808*

Notes: The table reports sample means. Standard deviations are presented in brackets below the sample means. The subscript *i* denotes firms and the subscript *t* denotes time where t=1968-2000 for Datastream, t=1994-2004 for FAME and t=1994-2004 for CSMAR. *(LEV/A)* is the sum of long-term and short-term debt divided by assets. The other measures of leverage are long-term debt over assets *(LTD/A),* short-term debt over assets *(STD/A*) and net leverage *(Net LEV/A*). *(CF/A)* is cash flow divided by assets, our main measure of liquidity. *(Log Sales)* is the log of sales, *(INV/A)* is the firm's investment as a percentage of assets *(STRUC/A)* is the ratio of tangible assets to total assets that acts as a measure of collateral, we use Tobin's Q *(Q)* or a sales growth measure *(SalesG)* to proxy for growth opportunities and *(TAX*) is the proportion of tax paid as a percentage of profit that proxies for tax rate.

Table 7.2: Regression Results: First Difference GMM

	Listed UK firms Datastream	*Unquoted UK firms Fame*	*Listed Chinese Firms Csmar*
$(LEV / A)_{it-1}$	*0.429***	*0.486**	*0.402***
	(0.031)	*(0.026)*	*(0.075)*
$(Cash\ Flow)_{it}$	*-0.527***	*-0.259***	*-0.425***
	(0.055)	*(0.082)*	*(0.118)*
$(Log\ Sales)_{it}$	*0.018***	*-0.106***	*0.023**
	(0.010)	*(0.025)*	*(0.014)*
(Investment/A)	*0.168***		
	(0.074)		
$(STRUC/A)_{it}$		*-0.018*	*-0.022*
		(0.021)	*(0.080)*
Q	*0.006***	*0.043*	*-0.007*
	(0.002)	*(0.107)*	*(0.010)*
$(SalesG)_{it}$			
$(Tax)_{it}$	*0.019**	*0.014*	---
	(0.012)	*(0.020)*	
J	*0.341*	*0.934*	*0.096*
m2	*0.942*	*0.237*	*0.237*
Sample size	*3809*	*14955*	*1589*

Notes: We report asymptotic standard errors in parentheses. *m2* is a test for second-order serial correlation in the first-differenced residuals, asymptotically distributed as N(0,1) under the null of no serial correlation. The J statistic is a test of the overidentifying restrictions, distributed as chi-square under the null of instrument validity. Instruments used in column 1 are $(LEV/A)_{it,}$ $(Cashflow/A)_i$,$(INV/A)_{it}$,$(log\ Sales)_{it}$, $(Q)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Instruments used in column 2 are $(LEV/A)_{it,}$ $(Cashflow/A)_i$,$(STRUC/A)_{it}$,$(log\ Sales)_{it}$, $(Sales\ Growth)_{it}$ and $(Tax)_{it}$ all lagged two to five times. Instruments used in column 3 are $(LEV/A)_{it,}$ $(cashflow/A)_i$,$(STRUC/A)_{it}$,$(log\ Sales)_{it}$, and $(Sales\ Growth)_{it}$ all lagged two to five times. Time dummies are included in all specifications as regressors and instruments. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level. Also see notes to Table 7.1.

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