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## CHAPTER 1

### BACKGROUND AND INTRODUCTION

#### 1.1 INTRODUCTION

This thesis examines the interaction between financial liberalisation and the dynamics of capital structure for listed non-financial firms in South Africa. McKinnon (1973: 9) argues that financial liberalisation provides an incentive for domestic investors to accumulate more equity capital, thus lowering the costs of borrowing. Shaw (1973: 9) further demonstrates, theoretically, that financial liberalisation in emerging markets “... increases rates of return by widening exploitable investment opportunities...”

Financial liberalisation, in this case, is the process that involves the removal of several impediments that bring the emerging market in line with the developed world. This leads to the development of financial markets; thereby providing new financing opportunities within the economy. These propositions have sparked a renewed interest on the study of financial liberalisation and its effects on various financial fundamentals, including capital structure.

On the other hand, Modigliani and Miller (1958: 201) have demonstrated that, under perfect capital markets, capital structure is irrelevant. However, it has been shown that, under less restrictive assumptions, certain impediments (such as tax, information, agency and contracting costs) can play an important role in the determination of firm leverage. As discussed in the literature, considerable work has been done to enhance our understanding of firm financing behaviour. Nonetheless, more research needs to be conducted, particularly in the context of emerging markets.

Because financial liberalisation is associated with financial market development, firm financing behaviour should be viewed as a phenomenon that can be influenced by the process of financial liberalisation. Therefore, incorporating the notion of financial liberalisation into the dynamics of modern day capital structure provides a good framework for empirical work.

### **1.1.1 Goal of this chapter**

The goal of this chapter is to provide a comprehensive background and introduction to the study. Emphasis is placed on the motivation for the study, the evolution of the financial sector in South Africa, the research problem, the research objectives and the overall structure of the thesis.

### **1.1.2 Layout of this chapter**

The rest of this chapter is organised as follows: Section 1.2 discusses the developments in the South African financial sector. Section 1.3 discusses the motivation for this study. Section 1.4 identifies the research problem. Section 1.5 lists the research objectives. Section 1.6 defines the key terms used in this study. Section 1.7 outlines the structure of the thesis, and Section 1.8 concludes the chapter.

## **1.2 THE FINANCIAL SECTOR IN SOUTH AFRICA**

The financial sector in South Africa has developed quite extensively over the past few decades. Various factors such as the advent of technology, political and economic liberalisation of the late 1980s and 1990s have contributed to the growth of the financial sector. These developments provide research insights into the effects of financial liberalisation on the choice of capital structure for South African listed firms.

### **1.2.1 The evolution of the banking sector in South Africa**

There have been a number of developments in the South African banking sector, particularly, since the discovery of gold in the Witwatersrand in 1886. Standard Bank first opened its branch in Port Elisabeth in early 1863. The bank grew its operations aggressively and by the end of the year, 18 branches were opened throughout the country (Jones and Verhoef, 2006: 16). The product offering was refined by the introduction of new banking products. For example, in 1949, the Netherlands Bank pioneered Negotiable Certificates of Deposits (NCDs) and the introduction of an industrial finance subsidiary.

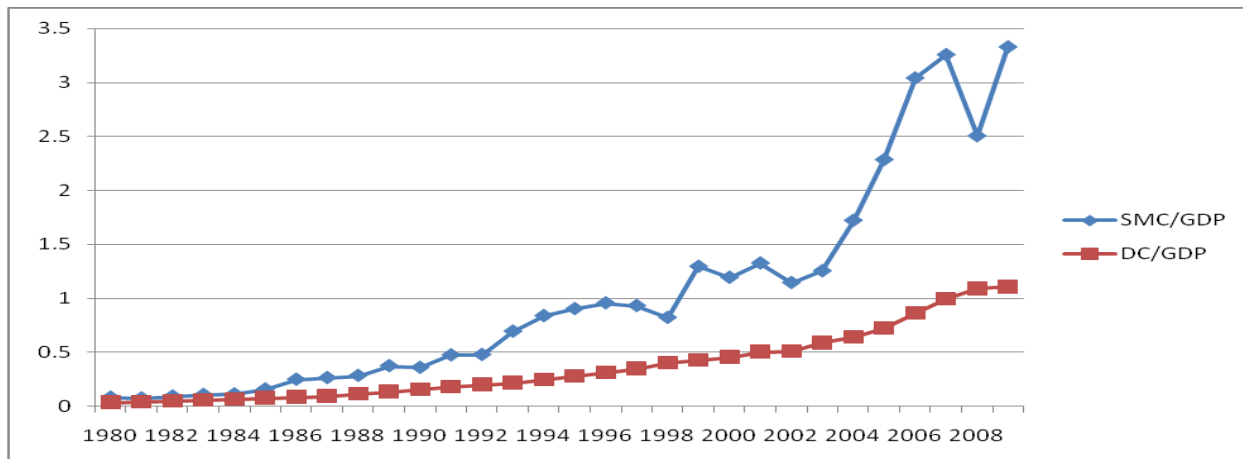
The bank further expanded its operations into merchant banking and the introduction of a discount house. In the mid 1960s, Barclays Bank introduced mortgage loans, and other banks followed suit. Vehicle financing was also introduced around the same time. This led to the establishment of Wesbank in 1964, which later introduced the credit card facility in 1970.

The preceding developments were followed by a period of consolidation in the banking sector. In 1973, Nedbank acquired United Acceptances Limited and, in 1974, Volksas acquired the Orange Free State bank. Eventually, in 1991, Allied Bank, Sage Bank, United Bank and Volkskas merged to form the Amalgamated Banks of South Africa (ABSA).

The South African Reserve Bank (SARB) was established in 1921 as the monetary authority for all financial institutions in South Africa. It was established to, among other things, formulate and implement monetary policy and to ensure a sound money, banking and financial system.

Figure 1.1 shows some key indicators of stock and banking sector development in South Africa. The DC/GDP (Domestic credit to the private sector to gross domestic product) ratio is a measure of the importance of credit extension to the domestic private sector relative to the economy. The DC/GDP line increases steadily throughout the entire period of observation. This observation provides insights into the evolution of the banking sector in South Africa.

**Figure 1.1: Indicators of stock and banking sector development**



**Source: Author’s compilation from data obtained from the SARB**

### 1.2.2 The evolution of the JSE

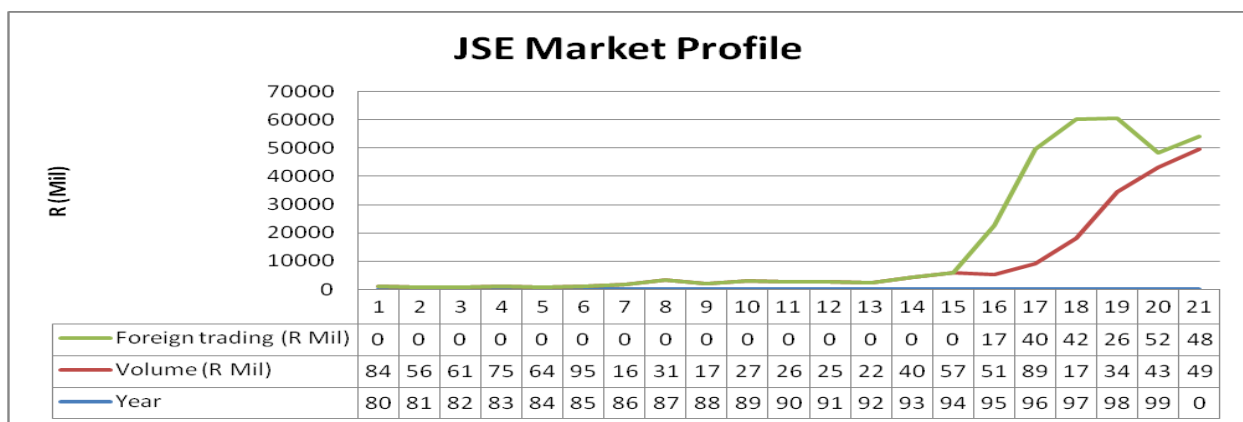
The JSE was first established on 8 November 1887. Trading on the JSE was mainly facilitated by the open outcry method. It was only in June 1996, that this system of trading was replaced by the Johannesburg Equities Trading system. This system enabled the online facilitation of all trading transactions. Although the exchange is over 100 years old, it is still classified as an emerging market.

Mody (2004: 642) shows that an emerging market is one that principally exhibits high returns and volatility, and has the potential for growth. In a true sense, The JSE can be reclassified as a re-emerging market, following the period of sanctions and political turmoil experienced in the mid 80s. Goetzmann and Jorion (1999: 2) state that stock markets submerge due to various political, economic and institutional reasons. The JSE somewhat submerged during this period of political turmoil, especially during the 1985 debt standstill. The JSE re-emerged in the late 1980s to the early 1990s after the economic sanctions were lifted.

The JSE is by far the largest stock market in Africa, and is in the top 20 world stock markets by market capitalization (JSE, 2009). Figure 1.1 shows the significance of the stock market. The SMC/GDP (Stock market to Gross Domestic Product) is a measure of the importance of the stock market relative to the economy. The SMC/GDP line increases

steadily from the 1985 debt standstill to early 2000s. A sharp increase is seen from 2002 onwards. Figure 1.2 shows some of the key trading figures relating to the JSE. Successful negotiations that led to the unbanning of the ANC and the eventual lifting of economic sanctions caused trading to increase sharply in the 1990s. Figure 1.3 compares the net purchase of shares and bonds by non-residents. A sharp increase in the net purchases of bonds and shares is observed from 1995, the year the JSE was liberalised. These observations provide an indication of the extent of financial liberalisation in South Africa.

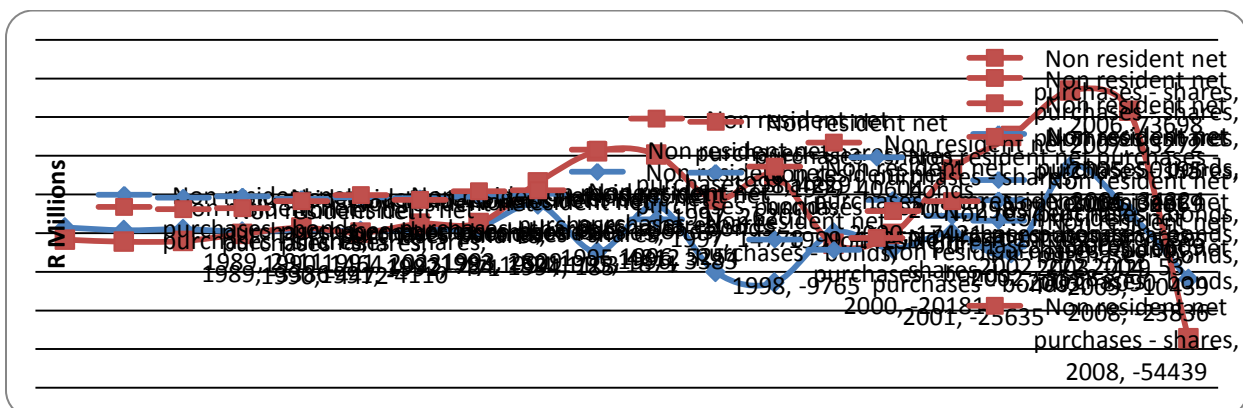
**Figure 1.2: JSE market profile**



Source: (JSE: 2010)

The re-emergence of the stock market presents an opportunity to test the outcome of this study, which is to examine the effect of financial liberalisation on capital structure of listed firms.

**Figure 1.3: Net purchases of bonds and shares by non-residents**



Source: Author's compilation from data obtained from the SARB.

### 1.2.3 Financial liberalisation in South Africa

The Exchange Control Regulations Act of 1961 introduced the current exchange controls in order to prevent the deterioration of the capital account. As a result, the dual exchange rate system was adopted, in which the financial Rand was introduced for all non-resident transactions. In other words, a sale of an asset by a non-resident would only be concluded with another non-resident. Therefore, the value of the financial Rand was dependent upon the supply and demand of the currency. The financial Rand was temporarily suspended in 1983 and re-introduced in 1985, due to political unrest and the subsequent withdrawal of credit lines by major foreign banks.

The financial Rand was re-introduced at a 40 percent discount to the commercial rate. Therefore, if firms wished to repatriate their South African holdings, they did so at the financial Rand rate. According to Levy (1999: 418), this was done to discourage disinvestment. Rodman (1994: 314) observes that the withdrawal of credit lines triggered a financial crisis, eventually leading to the collapse of the Rand. The problem was further compounded by disinvestment of 300 multinational corporations, of which at least 200 were American owned (Akinboade & Makina, 2006: 109). Investment into the country dwindled, and major multinational corporations like General Motors scaled down their operations.

Prior to 1980, the monetary authorities used a system of direct controls in order to manage the supply of money and credit. Such interventions were, according to Moll (1999: 16), in the form of liquid asset requirements and credit ceilings. To achieve a more efficient financial intermediation, the De Kock (1977) commission was instituted. This led to a series of reforms that were tailored towards a market oriented approach in macroeconomic management. As a result, the banking sector introduced measures to liberalise the interest rates in the early 1980s. For instance, all credit ceilings and deposit rates were abolished in 1980, and as from 1983, banks were permitted to pay interest on cheque accounts. Competition among banks was enhanced through the termination of the Register of Cooperation.

The eventual release of Nelson Mandela from prison in February 1990, and the first democratic elections in 1994, brought about much anticipation in the financial markets for a more liberalised economy. Multinational firms began to re-invest their assets in the country. A major step by the South African government was achieved on 13 March 1995, when the financial Rand mechanism was re-abolished, thereby giving foreigners full access to the JSE.

These developments paved way for the relaxation of exchange controls for residents. This created more incentives for foreign investors to operate in South Africa. Likewise, resident individuals and firms were permitted to invest abroad. From July 1995, local non-bank institutions like insurance firms, pension funds and unit trusts were permitted to invest in a foreign country through asset swap arrangements. This arrangement provided an exchange mechanism whereby local non-banking institutions could swap their existing asset portfolios with foreign assets.

Further relaxations of exchange controls for individuals and firms were announced by the Minister of Finance in March 1998. Another interesting development took place in March 2000; domestic firms were permitted to use the local currency to finance and service new and existing foreign debt accounts. In March 2001, the limit for South African firms to invest in Africa was increased from R50 million to R750 million, and up to R500 million for the rest of the world. This resulted in increased turnover for the JSE, as shown in Figure 1.2. The next section motivates the study.

### **1.3 MOTIVATION FOR THIS STUDY**

This section focuses on the main arguments for undertaking the study. Several imperatives have been discussed based on economic and political developments, financing constraints, capital inflows and other empirical issues. The motivation culminates with a brief argument for the choice of South Africa as a single country of focus.



### **1.3.1 The economic and political imperative**

Ever since the abolition of the apartheid system, a number of economic and political developments have led to a more open and efficient economy. For instance, Bhaduri (2000: 413) argues that structural adjustments within the financial sector, and the widening and deepening of capital markets have presented firms in developing countries an opportunity to optimally determine their choice of capital structure. Moreover, Prasad, Green and Murinde (2001: 22) observe that ‘... each country’s system of corporate finance retains some of its own distinctive features, partly because of its historical development, and partly because of current economic circumstances, particularly the existing regulatory regime ...’

The aforementioned arguments can be attributed to the political and economic developments in South Africa. The unbanning of the African National Congress (ANC) in February 1990 and the lifting of international sanctions in the early 1990s increased investor confidence in the market place. The successful democratic elections held in 1994 paved way for the official liberalisation of the JSE in March 1995. Subsequently, steps were taken to deregulate the capital account. This led to the gradual relaxation of exchange controls. These developments present a unique imperative to empirically test the effect of financial liberalisation on the capital structure of South African listed firms.

### **1.3.2 The cost of equity capital imperative**

Makina and Negash (2005a: 145) empirically analyse the relationship between stock market liberalisation and the cost of equity capital for South African listed firms. Consistent with Stapleton and Subrahmanyam (1977: 307), Stulz (1990: 3), Henry (2000a: 529) and Bekaert and Harvey (2003: 3), Makina and Negash (2005a: 154) conclude that stock market liberalisation lowers the cost of equity capital. This result is evident for most of the firms in their sample. The plausible explanation for this finding is provided by Henry (2000a: 529), who argues that the liberalisation of the stock market provides a basis for risk sharing between domestic and foreign agents.

This finding has important implications for this study. Firstly, assuming that future cash flows are held constant, the lower cost of equity capital should increase equity prices. The observed change in the equity weighting should affect the listed firms' capital structure.

Secondly, because of the reduction in the aggregate cost of equity capital, investment in projects should increase (Henry, 2000b: 302). In particular, some of the projects with a negative net present value will be accepted because of the lower cost of capital. The expected increase in the investment could be financed by, *inter alia*, an issue of equity. This dynamic shift in financing should affect the capital structure of firms listed on the JSE. Finally, because of the lower cost of equity capital, it should be easier for firms to issue more equity capital (Bhaduri, 2000: 431). These implications provide an opportunity to empirically test whether the capital structure of listed firms is affected by financial liberalisation.

### **1.3.3 The capital inflow imperative**

The opening up of the stock market increases net capital inflows. Bekaert *et al.* (2002b: 297) show that, as investors rebalance their portfolios, net capital inflows to the liberalised economy increase sharply. This is evident for the first three years following financial liberalisation. If the net capital inflows increase following financial liberalisation, it is necessary to determine the effects of these inflows on firm financial restructuring.

### **1.3.4 The financial constraints imperative**

A number of researchers have tested the effect of financial liberalisation on credit constraints. For example, Guncavdi, Bleaney and McKay (1998: 443) examine the shifts in private investment for Turkish firms, and they find no evidence that credit constraints are relaxed after financial liberalisation. Habibullah and Smith (1999: 262) examine firms in 10 Asian developing countries, and (with the exception of South Korea) they find no evidence that financial constraints are reduced. However, Gelos and Werner (2002: 1) only confirm a reduction in the credit constraints for smaller manufacturing firms in Mexico. Ozatay and

Sak (2002: 6) find no significant effect of portfolio flows on financing constraints for Turkish firms. These findings may suggest that as the economy becomes more liberalised, financing constraints may not be affected significantly.

On the contrary, Hübler, Menkhoff and Suwanaporn (2008: 405) assess whether financial liberalisation reduces credit constraints for Thai firms, and they find that, following financial liberalisation, interest rate spreads reduce, thus indicating lower borrowing costs. If there is a reduction in credit constraints, there is a possibility that in some cases, financial liberalisation may lead to excessive borrowing. As observed by McKinnon and Pill (1997: 189), financial liberalisation may cause excessive foreign borrowing by firms. If this is the case, then it is expected that the debt proportion for listed firms will increase.

### **1.3.5 Other imperatives**

According to Ameer (2003: 1), financial liberalisation presents an opportunity for firms in emerging markets to optimally restructure their financing portfolios. The author notes that, as the economy proceeds to full liberalisation, the market mechanism is reinstated. This causes less efficient firms to exit while the most efficient firms remain. The reinstatement of the market mechanism suggests that remaining firms optimally utilise the capital markets. Therefore, it is important to determine how this capital is allocated between debt and equity.

### **1.3.6 Why South Africa?**

The choice of South Africa as a single country of focus is important because of the following reasons: Firstly, the majority of the studies on the effects of financial liberalisation on capital structure have been conducted for other emerging markets other than South Africa. In studies which examine a number of countries, South Africa is usually excluded. For example, Harris, Schiantarelli and Siregar (1994: 17) focus on financial liberalisation and its effects of, *inter alia*, capital structure for Indonesian manufacturing firms. Galego and Loayza (2000: 28) examine the macroeconomic developments and firm financial structure for Chilean firms. Bhaduri (2000: 413) explores financial liberalisation

and the capital structure of firms in India. Schmukler and Vesperoni (2006: 186) examine the same issues with emphasis on a panel of firms in East Asia and Latin America.

One notable exception is Demirguc-Kunt and Maksimovic (1996: 341) who study the effects of stock market development on corporate capital structures for 30 countries, including South Africa. However, as their title suggests, their analysis is limited to the impact of stock and banking sector development on capital structure. It is important to fill this gap and relate the findings to other studies for emerging markets.

Secondly, studies that ignore a separate analysis of the countries, and pool data, run the risk of excluding the underlying dynamics of the individual countries in the analysis. A reduction in leverage for the whole sample may not mean that all firms in the cross country analysis exhibit this phenomenon. Given this caveat, it is important to investigate the underlying financial behaviour of South African listed firms in line with the unique economic developments in South Africa.

Thirdly, the financial reforms that occurred during the period of the 1990s are unique to South Africa. For instance, the lifting of international sanctions provides a unique imperative to isolate South Africa from other countries. The dismantling of apartheid and the successful democratic elections paved way for the opening of the JSE and the abolishment of the financial Rand. These unique aspects of reforms provide a good enough reason to perform rigorous and tailor-made analyses for South Africa.

Finally, South Africa has extensive and reliable data on firm financial statements dating back to the mid 1980s. This makes it possible to test the response of corporate financing behaviour to the financial liberalisation events that occurred in the late 1980s to the late 1990s. It is difficult to obtain reliable financial records that date back to the 1980s for firms in other African countries. The motivations provided in the preceding discussion provide a basis for discussing the research problem in the next section.

## **1.4 THE RESEARCH PROBLEM**

The nature of the process of financial liberalisation is complex and dynamic (Demirguc-Kunt & Levine (1996: 292), Bekaert, Harvey & Lumsdaine (2002a: 204) and Bekaert & Harvey, (2003: 5)). This complexity can be attributed to the simultaneous reform of the stock market, the domestic financial sector and the capital account. Effectively, firm financial choices should be affected by the concurrent reforms. As noted by Ameer (2003: 1), financial liberalisation presents an opportunity for firms to rebalance their financing portfolios. Based on the aforementioned arguments, there are six main implications that need to be empirically resolved.

### **1.4.1 The implications of stock market liberalisation**

There are five main implications of stock market liberalisation on capital structure. Firstly, stock market liberalisation allows domestic listed firms to have access to international equity, and foreign investors can invest in the equity of the domestic listed firms. This dynamic shift in financing and investment opportunities may alter the capital structure of listed firms. The key question arising from this issue is: how have listed firms responded to this dynamic shift by way of capital restructuring?

Secondly, the opening of the stock market to foreign investment creates an opportunity for domestic firms to have more access to the stock market (Bhaduri, 2000: 431). This creates competition for the local banks. The plausible prediction from this finding is that, all things being equal, leverage ratios should decline. However, Demirguc-Kunt and Levine (1996: 293) argue that as the equity market develops, so does the domestic banking sector. Indeed, following financial liberalisation, international banks re-invested their assets in South Africa, and the Bond Exchange of South Africa (BESA) was instituted and developed simultaneously with the JSE. Furthermore, the liberalisation of the capital markets allowed domestic listed firms to access the foreign debt and equity markets.

The increase in the supply of other forms of public debt could have stimulated competition for the local banks. As a result, these banks may have been forced to lower their lending

rates. As observed by Hübler, *et al.* (2008: 1), interest rate spreads for Thai firms reduced following financial liberalisation, thus indicating lower borrowing costs. Having said this, little is known about how financing patterns evolved with financial liberalisation. This dynamic shift in financing is expected to have altered the capital structure of listed firms.

Thirdly, Bekaert and Harvey (2000: 565), Henry (2000b: 529), and Kim and Singal (2000: 25), among others, provide conclusive evidence that stock market liberalisation lowers the aggregate cost of equity capital. Makina and Negash (2005a: 154) conduct a firm level analysis for South African listed firms. They find that some of the firms in their sample experienced a significant increase in the cost of equity capital. The implication is that, following stock market liberalisation, some firms could have experienced a decline in their leverage ratios while others could have experienced the opposite effect.

Fourthly, the dynamic shift in capital structure is dependent on whether financial liberalisation has a significant influence on financial constraints. Guncavdi *et al.* (1998: 1) and Habibullah and Smith (1999: 1) find no evidence that financial constraints are reduced following financial liberalisation. However, Gelos and Werner (2002: 1) confirm a reduction in the credit constraints for smaller firms. From the aforementioned facts, a reduction or increase in financing constraints could have affected decisions by corporate managers in issuing external finance.

Finally, as the domestic economy is liberalised, investors rebalance their portfolios to include assets in the emerging market. This has the effect of increasing capital inflows in the form of portfolio flows. Once this rebalancing has been achieved, the net flows should decline. Bekaert, *et al.* (2002a: 297) examine the effects of financial liberalisation in 20 emerging markets. They report that portfolio flows to the liberalised stock market increase in the first three years after financial liberalisation, and level off thereafter. Accordingly, equity prices should increase, and holding other things constant, leverage ratios are expected to decline.

#### **1.4.2 The implications of the lifting of international sanctions**

The second issue relates to the implications of the lifting of international sanctions on South Africa. By the end of 1992, most of the economic sanctions on South Africa were lifted. This removal of sanctions provided a more active trading environment for domestic firms, thus increasing the financing options for investment. It is at this stage not clear how the financing behaviour of listed firms unfolded due to these economic developments. What has been documented so far is that proxies for the cost of equity capital experienced a significant decline at this period (Makina and Negash, 2005a: 154). This could have led firms to access more of equity finance relative to debt. However, the development of the banking sector could mitigate this effect. This caveat needs to be addressed empirically.

#### **1.4.3 The implications of domestic financial sector liberalisation**

The third issue relates to the implications of domestic financial sector liberalisation. The series of reductions in the reserve requirements in the 1990s may have provided opportunities for banks to lend more finances to the domestic private sector. For example, in February 1991, the monetary authorities abolished the basic requirement of 2 percent of all medium term liabilities. At the same time, the requirement against short term liabilities was reduced from 5 percent to 4 percent. In April 1993, a further drop of 1 percent of short term liabilities was effected. The supplementary minimum cash reserve requirement of 1 percent of short term liabilities was eventually withdrawn in April 1998<sup>1</sup>.

Holding all other things constant, these developments could have led to an increase in credit extension to the domestic private sector. It is not clear, however, whether the net lending effect could be significant, owing to the following two reasons: firstly, despite the lowering of reserve requirements, there are some dates in between the decreases when marginal increases were effected. Secondly, the resulting increase in lending by banks could have been mitigated by the significance of the development of the stock market.

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<sup>1</sup> See Nel (2002: 70) for a detailed discussion of the lowering of reserve requirements.

#### **1.4.4 The implications of capital account liberalisation**

The fourth implication is associated with liberalisation of the capital account liberalisation. Starting from March 1995, several exchange control relaxations were effected. In March 1997, corporations were permitted to repatriate more funds for investment, and at the same time, domestic firms were permitted to borrow from abroad. Further controls were eased in March 1998, thus allowing corporations to repatriate more amounts of cash to other countries in the world. The limit on foreign investment was later increased in March 2001. These developments allowed corporations to participate more in foreign repatriations. However, the increased repatriations could have been financed by domestic equity, debt or even foreign debt. Consequently, the empirical association between capital account liberalisation and leverage is a matter that needs to be examined carefully.

#### **1.4.5 The implications of market segmentation**

The fifth implication involves the issue of market segmentation. There is some documented evidence that if markets are segmented, then firms operating in the same macro economic framework will respond differently to the process of financial liberalisation. For example, Schmukler and Vesperoni (2006: 186) show that firms with access to international equity markets respond differently to stock market liberalisation compared to domestically financed firms.

Furthermore, compared to large firms, smaller firms have been shown to respond differently to the process of financial reforms. For example, Harris *et al.* (1994: 17) show that the market based allocation of credit increases borrowing costs for small firms. However, Gelos and Werner (2002: 1) find a reduction in credit constraints for smaller firms. Bhaduri (2000: 413) shows that larger firms are more responsive to the process of financial liberalisation than smaller firms. There is therefore, a need to test whether these issues apply in the South African context.



#### **1.4.6 The implications of transaction costs**

The sixth implication involves the issue of transaction costs in a dynamic capital structure setting. It is necessary to establish whether firms operating in the period prior to, and after financial liberalisation follow a long run target adjustment to the desired level of leverage. Pursuant to this, the absence or presence of transaction costs needs to be established. Furthermore, if transaction costs are present, the associated speed of adjustment to the target level of leverage needs to be ascertained. The pre liberalisation regime has been characterised by a relatively underdeveloped stock and banking sector. This underdeveloped state of the financial markets limits the financing choices of domestic firms, thereby raising the costs of borrowing.

Given this scenario, firms operating in this environment may face higher transaction costs. Conversely, firms operating in the post liberalisation period may adjust more rapidly towards the target equilibrium. In other words, the associated speed of adjustment to the desired target level of leverage may be slower than the speed of adjustment for the post liberalisation period. These dynamic aspects of firm financing behaviour are only conjectures that need to be confirmed.

#### **1.4.7 Other unresolved issues**

The debt maturity structure of the different categories of listed firms is an important policy issue that needs to be clarified. Specifically, one would like to see smaller firms and other firms accessing longer term finance following financial liberalisation. Schmukler and Vesperoni (2006: 202) find an increase in the debt maturity structure for firms with access to international debt and equity markets. On the other hand, Galego and Loayza (2000: 29) find that the size of the banking sector is directly related to debt maturity for Chilean firms. In this respect, it is not clear whether the significance of the banking sector is associated with a longer debt maturity for listed firms in South Africa.

Demirguc-Kunt and Maksimovic (1998: 2107) attribute the variations in firm leverage to differences in the development of the stock and banking sectors. Fan, Titman and Twite

(2008: 2) reiterate this point by concluding that institutional differences are an important determining factor of capital structure choices. Given the exponential growth in both the South African stock and banking sector, it is necessary to test whether this growth has any significant effect on firm financing behaviour.

The literature on the importance of internal finance (See Mayer (1988: 1172), Atkin & Glen (1992: 377) Corbett & Jenkinson (1996: 71) and Mutenheri & Green 2003: 166)) documents that firms in Africa rely less on retained earnings compared to their counterparts in the developed economies. More importantly, one would like to observe the dynamics of this internal finance when financial liberalisation variables are brought into the analysis. Could it be that financial liberalisation may lead firms to retain more income? Furthermore, very little literature (See Boyle & Eckhold (1997: 434) and Mutenheri & Green (2003: 166)) has documented the determinants of financial structure in a closed economy, and how these determinants evolve with the transition to a more liberalised financial environment.

In summary, the main empirical issues to be resolved are stated as follows: **Financial liberalisation has provided opportunities for domestic listed firms to rebalance their financing portfolios. The implication is that leverage ratios could have been affected, but little is known about how these ratios were affected. Furthermore, it is not clear how the debt maturity structure, and the importance of retained earnings are impacted by financial liberalisation. Lastly, it is unclear how the dynamics of listed firm leverage evolve with the transition to a more liberalised economy.**

## 1.5 RESEARCH OBJECTIVES

Having identified the research problem, the main objective is to establish the effect of financial liberalisation on the book and market values of leverage for JSE listed non-financial firms. The main objective can be broken down into the following sub objectives:

1. To determine the effect of stock market liberalisation on the leverage of JSE listed non-financial firms

2. To determine the effect of the removal of economic sanctions on the leverage of JSE listed non-financial firms
3. To investigate the effect of domestic financial sector liberalisation on the leverage of JSE listed non-financial firms
4. To determine the effect of capital account liberalisation on the leverage of JSE listed non-financial firms
5. To explore the impact of financial liberalisation on the stability of capital structure determinants for JSE listed non-financial firms
6. To determine the effect of financial liberalisation on the choice of internal finance for JSE listed non-financial firms
7. To determine the impact of financial liberalisation on the debt maturity structure of JSE listed non-financial firms
8. To test the significance of stock and banking sector development on the choice of capital structure of JSE listed non-financial firms
9. To establish the extent of transaction costs and resulting speed of adjustment to the desired target level of leverage for the period prior to and after financial liberalisation
10. To establish the determinants of the speed of adjustment to the desired level of leverage

## 1.6 DEFINITION OF KEY TERMS

This study uses several key concepts that have been defined as follows:

**Capital account liberalisation:** refers to the series of exchange control relaxations.

**Capital structure:** The term capital structure refers to the way a firm finances its operations by utilising the choice between debt and equity.

**Debt:** The proportion of financing that is obtained from banks and the bond market

**Domestic financial sector liberalisation:** refers to the removal of interest rate ceilings and credit restrictions.

**Equity:** The proportion of financing that is obtained from the stock market.

**Financial markets:** These are organisations that facilitate the trade of financial products such as shares, bonds and warrants. The JSE is an example of a financial market.

**Financial Liberalisation:** The elimination of a series of impediments in the domestic financial sector in order to bring it in line with the developed economies.

**Stock market liberalisation:** occurs when foreign investors are given access to invest in the domestic listed firms through the purchase of shares, and when domestic investors are allowed access to the international financial markets.

**Leverage:** The extent of the use of debt in the firm's capital structure.

**Table 1.1: Abbreviations used in this document**

<b>ABBREVIATION</b>	<b>MEANING</b>
ADR	American Depository Receipts
ANC	African National Congress
BESA	Bond Exchange of South Africa
BTS	Broken Trend Stationary
CAL	Capital Account Liberalisation
CRSP	Centre for Research in Security Prices
Dep Var	Dependent Variable
DIFF GMM	Difference GMM
DF	Degrees of Freedom
DFF	Domestically Financed Firms
DFSL	Domestic Financial Sector Liberalisation
EBITDA	Earnings Before Interest, Tax, Depreciation & Amortisation
GLS	Generalised Least Squares
GMM	Generalised Method of Moments
IFC	International Finance Corporation
IFF	Internationally Financed Firms
IFRS	International Financial Reporting Standards
JSE	Johannesburg Stock Exchange
LSDV	Least Squares Dummy Variable
LIS	Lifting of International Sanctions
NCD	Negotiable Certificate of Deposit
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
PRF	Population Regression Function
RE/TL	Retained Earnings to Total Liabilities Ratio
SML	Stock Market Liberalisation
STD/TA	Short term Debt to Total Assets Ratio
SYS GMM	System GMM
TD/E(B)	Total Book Value Debt to Equity Ratio
TD/E(M)	Total Market Value Debt to Equity Ratio
TD/TA(B)	Total Book Value Debt to Total Assets Ratio
TD/TA(M)	Total Market Value Debt to Total Assets Ratio
VIF	Variance Inflation Factor

## 1.7 STRUCTURE OF THE THESIS

The rest of this thesis is structured as follows:

**Chapter two** provides a detailed analysis of the theory of capital structure. The chapter commences with the capital structure benchmark established by Modigliani and Miller (1958: 201). Further developments and counterarguments are discussed in line with the observed determinants of capital structure. Empirical work has been discussed, particularly with emphasis on the factors that are correlated with leverage. The chapter further documents the patterns of corporate capital structures in both the developed and developing economies. The main conclusion is that capital structure matters, and it is explained by various macroeconomic and firm level characteristics.

**Chapter three** provides a detailed analysis of the theory of financial liberalisation. The chapter commences with the broad definition of financial liberalisation. Next, the McKinnon (1973: 9) and Shaw (1973: 9) propositions that financial liberalisation leads to economic growth are discussed. The process of financial liberalisation is highlighted with emphasis on its impact on the factors that are directly and indirectly related to leverage. These elements include capital flows, credit constraints and firm financing. Another aspect relating to the dating of financial liberalisation is discussed with a comparison of dates used by different studies for various emerging economies. The main conclusion from this chapter is that financial liberalisation matters, subject to certain conditions, and that capital structure is influenced by the dynamics of financial liberalisation.

**Chapter four** formulates research hypotheses based on the identified research problem. The conjectures underlying the hypotheses are carefully developed around the impact of financial liberalisation on capital structure. These include a presupposition that the lifting of international sanctions, stock market, banking sector and capital account liberalisation have a significant impact on firm financing behaviour. Furthermore, it is hypothesised that there are structural breaks in the parameter estimates of the regression equations.

**Chapter five** provides a background to the choice of methodology by highlighting and clarifying several measurement caveats. Firstly, the leverage measurement problem is clarified by providing justification for the use of firm level book and *quasi* market measures of leverage. Secondly, the dating problem is clarified by highlighting the problems associated with the dating of financial liberalisation and suggesting a suitable dating approach for the study. Finally, the choice of variables is justified based on the nature of the study and other empirical work.

**Chapter six** develops the econometric approaches to testing the formulated hypotheses. Panel data estimation techniques are advocated for, due to the following reasons: Firstly, panel data estimation allows the incorporation of a large cross-section of firms over a short period of time. Secondly, panel data estimation can model the dynamics of change over a relatively short period of time. Thirdly, with panel data, it is possible to control for firm heterogeneity and endogeneity in the variables being tested. Finally, panel data dynamic models can estimate lagged effects of explanatory variables on the dependent variables. The fixed and random effects (Generalised Least Squares) regressions, pooled OLS estimations, instrumental variable and dynamic models of capital structure are discussed.

A separate dummy variable is used for each measure of financial liberalisation. Control variables are included in the regressions in order to isolate those factors that may impact capital structure in the process of financial liberalisation. Indicators of stock and banking sector development are also incorporated into the econometric models.

The next approach is to test for structural change in each of the coefficients to establish whether a change in regime has affected the stability of corporate capital structure determinants. This is achieved by interacting each explanatory variable with a financial liberalisation dummy. Furthermore, dynamic panel data models developed by Arellano and Bond (1991: 277) and Arellano and Bover (1995: 29) are used to model capital structure determinants for the periods before and after financial liberalisation. The firm specific variables are also interacted with the lagged dependent variables. This exercise is performed in order to estimate the effects of firm characteristics on the capital structure adjustment speed.

**Chapter seven** reports the results based on the econometric methods developed in Chapter six. The results are presented in the following manner: summary statistics are presented with emphasis on the effects of financial liberalisation on leverage ratios for five sets of firms. These include firms that participated in international equity issues, firms that did not have access to international equity markets, small firms, large firms and the full sample set.

Thereafter, regression results are reported for the static panel data models. The results are categorised by size to include small, large and a set of the full sample. The results of the interactive dummy estimates are also reported. Robustness checks are performed using the instrumental variable and two-step GMM estimation techniques. Finally, the results of the dynamic panel data models are reported.

**Chapter eight** concludes the overall thesis and includes a concise statement of the theoretical and methodological contribution of the study. The shortcomings of the study are addressed, and suggestions for further studies are made.

## **1.8 CHAPTER SUMMARY**

This chapter introduced the study by incorporating the background and motivation for the research. The series of political and economic events that occurred in the past three decades have provided an incentive to test the effects of financial liberalisation on the capital structure of the JSE listed firms.

The opening of the JSE to foreign investors could have a number of implications on the choice of capital structure. Given the empirical evidence that stock market liberalisation induces a reduction in the cost of equity capital, investment is expected to increase. The motivation, therefore, states that investment will have to be financed by the choice between debt and equity.



As foreign investors rebalance their portfolios, the capital inflows into the domestic stock exchange increase sharply in the first three years. This increase should affect the financial structure of listed firms. It has also been argued that, as the stock market develops, so does the banking sector. Competition in the capital markets would imply a reduction in the cost of borrowing. The resulting effect on the capital structure of listed firms is a matter that needs to be empirically tested. The mixed evidence regarding the effects of financial liberalisation on financing constraints also presents a good case to test whether listed firms' access to the debt markets is affected by financial liberalisation.

The research problem has been identified based on the implications of the lifting of international sanctions, stock market, capital account and domestic financial sector liberalisation on capital structure. The evolution of the financial sector has been discussed with primary emphasis on the JSE and the domestic banking sector. This was followed by a discussion on the various reforms that constitute financial liberalisation in South Africa. The next chapter discusses the theory of capital structure.

## CHAPTER 2

### THE THEORY OF CAPITAL STRUCTURE

#### 2.1 INTRODUCTION

The study of capital structure attempts to explain how listed firms utilise the mix of various forms of securities in order to finance investment. Modigliani and Miller (1958: 201) demonstrated that capital structure is irrelevant under certain restrictive assumptions. Ever since then, many researchers have approached the study of corporate capital structure under less restrictive assumptions. This has led to the confirmation of an existence of the optimal choice of capital structure. Unfortunately, there has been little consensus among researchers on what the optimal capital structure is. However, it is important to synthesise the literature on capital structure and where possible, to relate the literature to known empirical evidence.

##### 2.1.1 Goal of this chapter

The goal of this chapter is to discuss the various theories that help to explain the determination of capital structure. The capital structure puzzle is unravelled and a clear picture is presented in terms of why capital structure matters. The patterns of corporate capital structures around the world are also discussed.

##### 2.1.2 Layout of this chapter

This chapter is organised as follows: Section 2.2 provides a detailed justification on why capital structure matters. Section 2.3 discusses the principal theories of capital structure, namely, trade-off, agency, signalling, pecking order and contracting cost theories. Section 2.4 discusses the factors affecting the capital structure of firms throughout the world. Section 2.5 documents the differences in corporate capital structures between firms in the developed and developing countries. Section 2.6 concludes the chapter.

## 2.2 DOES CAPITAL STRUCTURE MATTER?

The concept of capital structure received much attention after Modigliani and Miller (1958: 261) demonstrated in their paper that the choice between debt and equity does not have any material effects on the value of the firm. This proposition indeed holds assuming perfect capital markets. A perfect market is one in which there are no frictions such as transaction and bankruptcy costs. However, in the real world, one may ask whether all capital markets are perfect. When market imperfections such as transaction and bankruptcy costs are considered, capital structure may well be relevant. As pointed out by Strabulaev (2007: 1787), small adjustment costs may cause large variations in capital structure.

Modigliani and Miller (1963: 433) subsequently corrected their capital structure irrelevance proposition for taxes. Because interest on debt is a tax-deductible expense, the firm effectively reduces its tax bill as it employs more debt. As the debt to equity ratio increases, the market value of the firm increases by the present value of the interest tax shield. This implies that the cost of capital will not rise, even if the use of leverage increases to excessive levels. Solomon (1963: 276) argues that, in an extreme leverage position, the cost of capital must rise. This is because excessive levels of debt will induce markets to react by demanding higher rates of return. Therefore, to minimise the weighted average cost of capital, firms will avoid a pure debt position and seek an optimal mix of debt and equity. Moreover, Kim (1978: 45) observes that during the period between 1963 and 1970, non-financial firms in the United States were financed by only one-third of debt. This finding provides circumstantial evidence that, in the presence of taxes, firms will avoid a pure debt position.

Baxter (1967: 395) provides two main reasons for the low debt ratios observed in levered corporations. Firstly, the interest rate on debt is positively related to the debt to equity ratio. This implies that as the firm borrows more, creditors will demand a higher rate of return on the borrowed funds. Secondly, higher debt levels could lead to the probability of default on interest payments, thereby leading to bankruptcy. For these reasons, firms will

seek a level of financing that maximises the tax savings induced by higher debt levels and, at the same time, minimising the possibility of bankruptcy costs.

Several studies have, however, confirmed the existence of an optimal debt-equity mix. This is based solely on the existence of market imperfections such as transaction and potential bankruptcy costs. For instance, Baumol and Malkiel (1967: 554) demonstrate by use of indifference curves that the introduction of transaction costs to the value irrelevance equation produces a disequilibrium, in which the shareholder seeks an optimal point in the mix of debt and equity.

A few years later, Stiglitz (1972: 458) considered the implications of bankruptcy on the value of the firm, and argues that under certain assumptions, there is an optimal capital structure. This argument is based on the basis that in the absence of bankruptcy, nominal rates on debt are independent of the debt to equity ratio. However, when there is a possibility of bankruptcy, the nominal rates on debt increase, thus rendering bonds to be more risky. Therefore, the market value of the firm will depend on the possibility of bankruptcy, even if transaction costs were ignored.

Kraus and Litzenberger (1973: 911) introduce corporate taxes and bankruptcy penalties into a state preference model of optimal financial structure, and they confirm the existence of an optimal capital structure. Pursuant to this, Turnbull (1979: 939) shows that the optimal capital structure of a value maximising firm will occur before the firm's debt capacity. This is the maximum amount of credit that can be extended by lenders. Furthermore, Brennan and Schwartz (1978: 103) argue that the possibility of bankruptcy costs increases the uncertainty of future tax savings, and they demonstrate that this uncertainty is sufficient to induce an optimal capital structure, even if bankruptcy costs are isolated from their model.

According to Miller (1988: 102), the capital structure irrelevance proposition was not intended to suggest that "... the debt-equity ratio was indeterminate ...". Given this backdrop, Myers (2001: 86) advises that the Modigliani and Miller (1958: 201) propositions

should be viewed as a benchmark, and not the ideal end result. The propositions are simply showing that financing does not matter, except for specific transaction costs.

In conclusion, the literature on the capital structure debate has progressed from the irrelevance propositions of Modigliani and Miller (1958: 201) to the counter arguments based on more realistic assumptions. The introduction of taxes and bankruptcy costs suggest the existence of an optimal capital structure, which financial theorists have failed to determine due to lack of precise capital structure models. The major competing theories of capital structure are discussed in the next section.

## **2.3 THEORETICAL DETERMINANTS OF CAPITAL STRUCTURE**

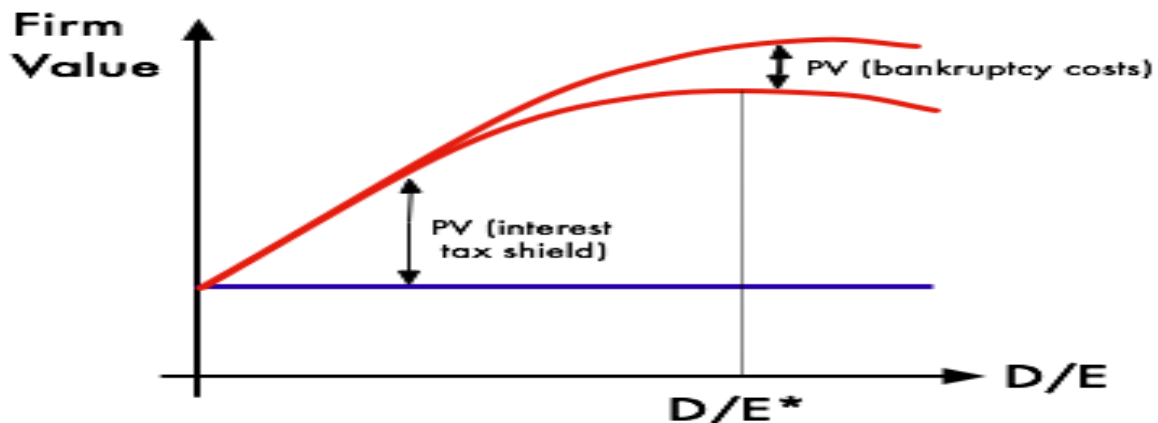
This section reviews the principal theories of capital structure. These are the trade-off, agency, contracting cost and information costs theories. The information costs theories comprise the signalling and the pecking order theory.

### **2.3.1 The trade-off theory**

The trade-off theory of capital structure postulates that managers attempt to balance the benefits of interest tax shields against the present value of the possible costs of financial distress (Myers 2001: 88). This theory originated from the study of Kraus and Litzenberger (1973: 911), who formally introduced the interest tax shields associated with debt and the costs of financial distress into a state preference model. According to Chakraborty (2010: 296), the trade-off theory postulates that some form of optimal capital structure should exist pursuant to the balance between the present value of interest tax shields and the cost of bankruptcy. Bankruptcy costs can be classified under direct and indirect costs. As shown in Baxter (1967: 395), direct costs of bankruptcy include, *inter alia*, the administrative and legal expenses incurred by a firm that goes bankrupt. On the other hand, the indirect costs relate to the reduction in the market value of the firm due to the firm's inability to service its debt obligations. According to Barclay and Smith (1999: 10) the indirect costs of bankruptcy can constitute a substantial portion of the market value of the firm. Having said this, the dilemma in capital structure theory has been to determine to what extent debt can be employed in order to offset tax implications to the extent that the

risk of excessive debt is avoided. Figure 2.1 illustrates the trade-off that exists between the present value of the tax subsidy associated with an increase in leverage and the present value of bankruptcy costs. This provides a scenario whereby firms will seek for the optimal capital structure. This is the level at which the tax benefits are maximised while minimising the risk of bankruptcy, which arises from the use of excessive debt.

**Figure 2.1: The trade-off theory of capital structure**



**Source: Brealey, Myers and Allen (2007, 504)**

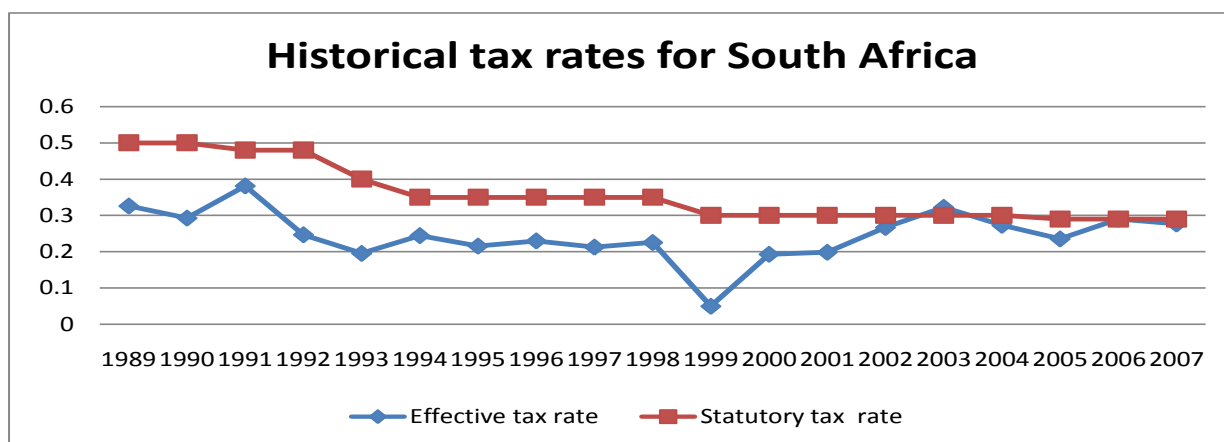
There are four main predictions of the trade-off theory. Firstly, the trade-off theory predicts that firms will have a target debt ratio and that these ratios will differ from firm to firm. This prediction is confirmed by Graham and Harvey (2001: 187) who report that the majority of the surveyed Chief Financial Officers agreed that they follow a target debt ratio.

Secondly, the trade-off theory predicts that firms with relatively safe tangible assets will be less exposed to the costs of financial distress, and will therefore, be expected to borrow more. Conversely, firms with risky intangible assets will be more exposed to the costs of financial distress, and will be expected to borrow less. This prediction is confirmed by Rajan and Zingales (1995: 1453) for firms in seven developed countries, Frank and Goyal (2009: 26) for non-financial firms in the United States and Qiu and La (2010: 283) for non-financial firms on the Australian Stock Exchange.

Thirdly, the trade-off theory predicts that higher marginal tax rates will be associated with higher levels of leverage. This is because of the tax deductibility of interest. Using tests based on incremental decisions, MacKie-Mason (1990: 1471) documents that firms faced with higher marginal tax rates are more likely to have higher debt ratios, and firms with low marginal tax rates will issue more equity compared to debt. Using data for more than 10 000 firms, Graham (1996: 41) finds a statistically significant positive association between debt ratios and marginal tax rates. Contrary to the prediction of the trade-off theory, Negash (2002: 25) reports a negative association between tax rate variables and debt for 64 firms listed on the JSE's industrial sector. This result is expected because for South Africa, the incentive to take advantage of the tax shields could have been mitigated by the declining tax rates over the period of assessment. Figure 2.2 shows that statutory and effective tax rates have been on a general declining trend for the past 20 years.

Fama and French (1998: 819) utilise cross-sectional regressions to determine the effect of taxation on firm value. They find no evidence that interest tax shields contribute to the market value of the firm. If this is the case, there may be no incentive for firms to add more debt to take advantage of the tax shields. On balance, the documented evidence suggests that taxes seem to play a moderate role in explaining the capital structure of firms.

**Figure 2.2: Statutory and effective corporate tax rates in South Africa**



**Source: Author's calculation using study data set**

Finally, the trade-off theory predicts that firms with more taxable income and relatively few non-debt tax shields such as investment tax credits and depreciation will have more

incentives to borrow (DeAngelo & Masulis, 1980: 4). Therefore, in order to take advantage of the interest tax shields, firms with fewer non-debt tax shields should be expected to borrow more. Conversely, firms with more non-debt tax shields should have less debt in their capital structure.

Bradley, Jarrell and Kim (1984: 873) find contrasting evidence to this prediction. They report a positive relationship between non-debt tax shields and firm debt to value ratios. This outcome is confirmed by Chakraborty (2010: 310) for firms in India. This positive association could also mean that firms with high non-debt tax shields such as depreciation have tangible assets in place. This enables them to support more debt. On the contrary, Titman and Wessels (1988: 13) report an insignificant negative association between non-debt tax shields and leverage. Likewise, Ozkan (2001: 187) employs a dynamic capital structure model for firms in the United Kingdom and reports a significant negative relationship between non-debt tax shields and leverage.

In sum, there is substantial evidence for the first three main predictions of the trade-off theory. The fourth prediction is moderately supported. Most studies show that firms with more non-debt tax shields have more debt in their capital structure.

### **2.3.2 The agency theory**

The agency theory is based on the notion that managers will not always act in the best interest of the shareholders. Jensen and Meckling (1976: 305) further elaborate on this concept by identifying two main conflicts between parties to a company, firstly, between the managers and shareholders, and secondly, between the shareholders and the creditors. In the first instance, managers are tempted to pursue the profits of the firms they manage to their own personal gain at the expense of the shareholders. In the latter instance, debt provides shareholders with the incentive to invest sub-optimally. Harris and Raviv (1991: 301) argue that if an investment yields returns higher than the face value of the debt, the benefits accrue to the shareholders. Conversely, if the investment fails, the shareholders enjoy limited liability by exercising their right to walk away. This leaves the debt holders with a firm whose market value is less than the face value of the outstanding debt.



Another potential agency cost of debt is pointed out by Myers (1977: 149). He notes that when firms are on the verge of bankruptcy, there is no incentive for shareholders to invest more equity capital, even if positive NPV projects are available. This is because the value derived from the projects will accrue mainly to the debt holders. The implication is that high debt levels may result in the rejection of value increasing projects.

Stulz (1990: 4) argues that debt payments may affect shareholders both positively and negatively. On the positive note, debt payments force managers to pay out interest thereby reducing the potential overinvestment problem. On the negative side, excessive debt may lead to high interest repayments, which may lead to the rejection of profitable projects, thus leading to the underinvestment problem. Capital structure is therefore determined by a trade-off between the benefits and costs of debt.

Considerable work has been done to test the validity of the agency cost hypothesis. For example, Kim and Sorensen (1986: 139) detect the presence of agency costs in Compustat listed firms in the form of a strong relationship between insider ownership and leverage. Vilasuso and Minkler (2001: 65) employ a dynamic model of capital structure on a set of 28 publicly held firms, and demonstrate that agency costs are associated with shifts in leverage. Harvey, Lins and Roper (2004: 3) investigate whether debt can control the effects of agency costs for a set of emerging market firms, and they observe that the benefits of debt are concentrated among firms with high expected agency costs.

Berger and Bonaccorsi di Patti (2006: 1069) develop a profit efficient indicator as a measure of firm performance, and they confirm the predictions of the agency theory that higher leverage is positively related to profit efficiency. However, Brounen, DeJong and Koedijk (2006: 1409) survey managers in European countries and they find no evidence to suggest that agency costs influence capital structure decisions. Overall, evidence suggests that there is some support for the agency theory.

### 2.3.3 Information costs theories

Information costs are based on the information disparities between corporate managers and investors. This information disconnect is also known as asymmetric information. This has led to the development of the signalling and pecking order theories.

- **The signalling theory**

The signalling theory emanates from information asymmetries between firm management and shareholders. If managers believe that their firms are undervalued, they will issue debt first and then issue equity as a last resort. Conversely, if management believes that their firm is overvalued, they will issue equity first. The signalling theory was first coined by Ross (1977: 23) who posits that if managers have inside information, their choice of capital structure will signal information to the market. Leverage may well be influenced by the theoretical premise that increases in debt are a positive sign that managers are confident about future earnings. Debt contracts are a commitment by managers to make future interest payments. Failure to repay debt could lead to bankruptcy. This signals confidence to the market that the firm will have sufficient cash flows to service debt.

The shareholders of a firm are the residual claimants to the firm's cash flows. This is because promised interest payments are an obligation and have priority over dividends. As a consequence, share prices are more sensitive to financial structure announcements than bond prices. If managers are optimistic about their firm's future prospects, the firm's share price will appear more undervalued than bond prices.

Smith (1986: 12) empirically tests the signalling theory, and finds an average reduction of three percent in the share price of firms that announced new equity offerings. By contrast, there was a negligible decline in the share prices following debt issue announcements. In addition, increases in debt were associated with an increase in share price returns of about 14 percent for debt for equity substitutions.

Barclay, Smith and Watts (1995: 4) classify the firms whose earnings increased the following year as undervalued firms, and those firms whose earnings decreased the

following year as overvalued firms. They find a very small statistically significant positive association between leverage and unexpected earnings.

The implication of the signalling theory is that corporate managers will attempt to time equity issues based on the market's assessment of their shares. For example, Baker and Wurgler (2002: 1) report a strong relationship between firm financing decisions and historical market values of equity. In essence, the capital structure of a firm is the cumulative result of corporate managers' past attempts to time the market. However, Brounen *et al.* (2006: 1435) do not find any evidence to suggest that European managers signal their private information to influence capital structure. The evidence provided thus far suggests that, on average, the signalling theory holds.

- **The pecking order theory**

The pecking order theory takes the signalling theory one step further by suggesting that the information costs are substantial enough to warrant managers to issue the security with the least information costs (Barclay & Smith, 1999: 13). This theory was originated by Myers and Majluf (1984: 188) who demonstrate that a share issue is generally perceived negatively by the investors. This is because managers tend to issue shares when they are overpriced. Stated in simple terms, the pecking order theory suggests that in order to avoid the information effects of new share issues, a firm is more likely to issue debt than equity. This prediction is conditional on the managers' belief that their firm's securities are underpriced.

The pecking order theory implies that managers will follow the path of least resistance, and that they will work down a pecking order by opting to issue the cheapest form of financing. In this case, firms will opt for retained earnings as it has no adverse selection problems. When retained earnings are exhausted, the firm can then issue debt. When it does not make any more sense to issue more debt, equity can be issued as a financing source of last resort.

The pecking order theory suggests that firms with few investment opportunities and high free cash flows will have low debt ratios. Conversely, high growth firms with low free cash flows will have high debt ratios. A number of studies have confirmed the existence of the pecking order theory. Rajan and Zingales (1995: 1454) utilise a data set from seven industrialised countries, and they find some evidence for the pecking order theory in the form of a negative association between leverage and profitability. Using a sample of 157 firms in the United States, Shyam-Sunder and Myers (1999: 219) find support for the predictions of the pecking order theory. Although this is an influential result, a sample of 157 firms is relatively small compared to all the listed firms in the United States.

According to Frank and Goyal (2003: 218), this raises questions as to whether the theory is broadly applicable. Using funds flow data for a broader cross-section of American firms, they discover that net equity issues track the financing deficit more closely than net debt issues. This finding offers contrasting evidence to the predictions of the theory. Helwege and Liang (1996: 429) provide a direct test of the pecking order theory by examining the capital structures of 500 small firms that went public in 1983. They find that the use of external financing does not follow the pecking order.

On the contrary, Flannery and Rangan (2006: 478) adopt a partial adjustment model of firm leverage for firms listed on the Compustat (CRSP) database, and they confirm the existence of a pecking order. Leary and Roberts (2010: 351) utilise simulation techniques to test the accuracy of the pecking order theory. They perform their analysis by allowing firm debt capacity to vary with alternate variables associated with the trade-off theory. They find that the predictive power of the pecking order theory increases significantly with the variation. This finding suggests that the pecking order and the trade-off theories play an important role in explaining financing decisions.

Seifert and Gonenc (2010: 11) regress net debt issues on a financial deficit variable for firms in 23 emerging market economies. They conclude that pecking order financing is prevalent only in those emerging markets where there are issues of asymmetric information and significant agency costs. This finding lends support to the theory that financing decisions are a function of the prevailing market conditions firms are operating

in. Additionally, Bessler and Drobetz (2011: 123) examine the effects of asymmetric information on firm financing decisions, and they conclude that information asymmetry is the primary driver of dynamic pecking order behaviour. Specifically, the probability of issuing equity is documented to be more pronounced with reduced information asymmetries.

From the facts discussed, it appears that the evidence on the pecking order theory is mixed, mainly because of the methodology used and that financing decisions are subject to a number of factors that may influence capital structure differently.

#### **2.3.4 Contracting cost theories**

The contracting cost theories hinge on the underinvestment problem suggested by Myers (1977: 147). The underinvestment problem can be illustrated as follows; highly levered firms are more likely to pass up investment opportunities because of the risk of default. This problem is further exacerbated by the higher costs of equity associated with firms with the prospect of default. This may cause financially distressed firms to forgo both capital and investment opportunities. The prediction of the contracting cost hypothesis is that firms whose value consists mainly of the present value of intangible investment opportunities will choose lower debt ratios. This conservative approach to debt issuing is followed in order to minimise the adverse effects of the underinvestment problem. Conversely, large mature firms with fewer investment opportunities will choose high debt ratios because of the lower possibility of financial distress costs. This prediction is contrary to the pecking order theory which posits that high growth firms with relatively fewer cash flows will have higher debt ratios.

Several studies have tested the contracting cost hypothesis by using the volatility of earnings, growth in assets, growth in sales and the market to book ratio as a proxy for growth opportunities. For example, Bradley *et al.* (1984: 873) use the standard deviation of earnings before interest, taxes and depreciation divided by average book assets as a proxy for growth opportunities. They confirm a statistically significant negative relationship between leverage and volatility. This relationship is observed for both non regulated firms

and all firms in the sample. Barclay and Smith (1996: 210) use the market to book equity ratio as a proxy for growth opportunities, and they confirm a negative and statistically significant relationship between growth opportunities and leverage. Mutenheri and Green (2003: 166) use the percentage change in total assets as a proxy for growth for a sample of Zimbabwean listed firms, and they report a significant and positive relationship for the post reform period.

Abor and Biekpe (2005: 44) use growth in sales as a proxy for growth opportunities for firms in Ghana, and they report a positive and significant relationship between firm growth prospects and leverage. This positive association implies that growth firms require additional funds to finance investment opportunities. Adam and Goyal (2008: 41) demonstrate that the market to book assets ratio "... has the highest information content with respect to investment opportunities ...". Hence, Frank and Goyal (2009: 15) use this proxy to evaluate its relationship with leverage. They report a negative and statistically significant relationship between the market to book assets ratio and three of the four measures of leverage<sup>2</sup>. Ovtchinnikov (2010: 249) utilises difference-in-differences tests to estimate the dynamics of capital structure of firms in deregulated industries, and finds that firm growth opportunities are associated with lower debt ratios.

The preceding evidence suggests that when the market to book ratio (market to book assets and market to book equity) is used as a proxy for investment opportunities, a negative relationship is usually documented. However, when the growth in sales and assets is used, a positive association is normally detected. The intuition is simple; growth in a firm's asset base provides financiers some form of collateral for loan advancement. On the other hand, the market to book ratio may constitute a high proportion of intangible investment opportunities. Consequently, such firms will choose lower debt.

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<sup>2</sup> Rajan and Zingales (1995: 1422), Ozkan (2001: 180) and Ngugi (2008: 620) use market to book assets ratio and find a similar relationship.

### **2.3.5 The difficulties in testing the theories of capital structure**

Despite the evidence provided regarding the theories of capital structure, Barclay and Smith (1999: 9) argue that there is no model that convincingly tests the many competing theories of capital structure because of three reasons. Firstly, with the current tests, it is difficult to reject one theory in favour of the other. In other words, the theories are not mutually exclusive. In fact, with respect to the pecking order and trade-off theories, Fama and French (2005: 581) conclude that each of these two theories has an element of truth in explaining financing decisions. Secondly, it is not easy to measure many variables that affect the optimal capital structure, for example, it is not easy to determine managers' proprietary information, especially when you are testing the signalling theory. Finally, rather than being reducible to a precise mathematical formula, theories of optimal capital structure culminate in a qualitative prediction, hence less reliable than the asset pricing models.

### **2.3.6 Summary of the origins and evidence of the main theories of capital Structure**

Table 2.1 shows a summary of the origins and evidence of the main formal theories of capital structure. The next section elaborates on the factors affecting the capital structure of firms in the developed and developing economies.

**Table 2.1: Summary of the origins and evidence of the main theories of capital**

<b>Theory</b>	<b>Origin of theory</b>	<b>Evidence for</b>	<b>Evidence against</b>
Trade-off theory	Kraus and Litzenberger (1973: 121)	Mackie-Mason (1990: 1471), Graham (1996: 41) and Graham and Harvey (2001: 187) Qiu & La (2010: 283)	Fama and French (1998: 819), Wald (1999: 161)
Contracting Cost theories	Myers (1977: 147)	Bradley, Jarrell and Kim (1984: 857), Barclay and Smith (1995:14), Frank and Goyal (2009: 15)	Abor and Biekpe (2005: 44) and Mutenheri and Green (2003: 166)
Signalling theory	Ross(1977: 23)	Myers and Majluf (1984), Smith (1986: 12), Brennan and Kraus (1987), and Baker and Wurgler (2002: 1)	Barclay and Smith (1996: 17), Barclay and Smith (2005, 15) and Brounen <i>et al.</i> (2006)
Pecking order theory	Myers and Majluf (1984: 188)	Kester (1986: 5), Titman and Wessels (1988: 1) & Rajan and Zingales (1995: 1421), De Miguel and Pindado (2001: 91), Flannery and Rangan (2006: 478) Leary & Roberts (2010: 351)	Helwege and Liang (1996: 429) and Frank and Goyal (2003: 218)



Agency cost theory	Jensen and Meckling (1976: 305) and Myers (1977: 149)	Kim and Sorensen (1986: 131) Vilasuso and Minkler (2001: 65), Harvey <i>et al</i> , (2004: 3) and Berger and Bonaccorsi di Patti (2006: 1069)	Brounen, DeJong and Koedijk (2006: 1409)
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## 2.4 EMPIRICAL EVIDENCE ON FACTORS AFFECTING CAPITAL STRUCTURE

Corporate finance literature advocates for a number of factors that can be attributed to the cross-sectional variation in firm capital structure. This section provides an analysis of prior empirical literature on the most prominent factors that have been correlated to leverage.

### 2.4.1 Institutional, legal and financial factors

La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998: 1114) elaborate on access to external financing as being influenced by the legal and financial environment. Consequently, weak financial systems pose a significant hurdle to growth, as firms operating in this environment obtain less external financing. Demircug-Kunt and Maksimovic (1998: 2107) attribute the variations in capital structure to differences in the development of stock markets and banks, as well as differences in the underlying legal framework. Fan, Titman and Twite (2008: 2) examine a cross-section of firms in a heterogeneous sample of firms in 39 countries, and they conclude that institutional differences are an important determining factor of capital structure choices compared to other factors like industry affiliation. For example, they document that firms tend to use less debt in countries where dividends are preferentially taxed.

## 2.4.2 Size

Size can be considered as an explanatory predictor for variations in firm leverage. Larger firms are more likely to take on more debt than smaller firms. Eriotis, Vasiliou and Ventoura-Neokosmidi (2007: 325) argue, firstly, that larger firms can negotiate for loans on more favourable terms. This enables them to take on more debt at lower interest rates. Secondly, because larger firms are less risky than smaller firms, banks are willing to loan them more funds. This lowers their probability of default. Hence, a positive association is likely to be observed between size and leverage. On the contrary, Drobetz and Wanzenreid (2006: 948) argue that large firms have sufficient analyst coverage and are subject to lower costs of information asymmetries. Hence, they should access equity markets with relative ease. Moreover, the fixed costs associated with equity issues should be smaller for large firms. On that account, size should be inversely correlated to leverage.

The empirical evidence regarding size as a possible determinant of firm leverage is mixed. Marsh (1982: 121) examines the debt-equity choice for firms in the United Kingdom and reports a positive relationship between the size of the firm and leverage. This direct relationship is later confirmed by Bennet and Donnelly (1993: 52). Booth, Aivazian, Demirguc-kunt, and Maksomovic (2001: 112) use the natural logarithm of sales to measure the importance of size in a sample of emerging market economies, and they find size to be positively correlated with leverage for most of the countries in their sample. On the other hand, Deesomsak, Paudyal and Pescetto (2004: 399) use the natural logarithm of total assets, and they find a strong and statistically significant positive relationship between size and the debt to capital ratio for firms in the Asia-pacific region.

Huang and Song (2006: 28) use the natural logarithm of sales as a proxy for size for Chinese firms and they report strong and significant positive correlations between size and total leverage. Eriotis *et al.* (2007: 328) also use the natural logarithm of sales and they confirm a statistically significant positive correlation between size and leverage for Greek firms. Alternatively, Gwatidzo and Ojah (2009: 10) use the logarithm of total assets as a

proxy for size. They confirm a statistically significant positive relationship between leverage and size for firms in South Africa and Zimbabwe<sup>3</sup>.

Rajan and Zingales (1995: 1456) examine a cross-section of firms in seven industrialised economies and find that size is negatively related to leverage for firms in Germany and France. The plausible explanation for this inverse association is based on information asymmetries. According to the pecking order hypothesis, the information asymmetry between large firms and the capital markets should be low, thus enabling larger firms to issue informational sensitive securities such as equity with ease. This tends to lower the debt levels relative to equity.

Chen (2004: 1347) uses the natural logarithm of total assets and documents a negative association between size and the long term debt ratio for Chinese firms. The author argues that the negative association may be due to larger firms' reputation that enables them to access the equity markets with relative ease, and the fact that the Chinese public bond market is virtually nonexistent. Delcours (2007: 411) documents a similar inverse relation between size, measured by the natural logarithm of total assets, and long term leverage for firms in European transition economies. Nunkoo and Boateng (2010: 987) use the GMM technique to estimate capital structure determinants for 835 Canadian firms. They also document a negative correlation between size, measured by the natural logarithm of total sales, and the long term debt ratio.

To summarise, the picture that is emerging is that irrespective of the proxy being used, size tends to be strongly and positively correlated with leverage. However, in some studies, long term leverage is found to be inversely related to the size variable. This is due to the low information asymmetries associated with large firms.

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<sup>3</sup> The exception was for Nigeria where there was a significant negative relationship between leverage and size. The coefficients for Kenya were negative but insignificant with the exception of the long term debt ratio

### 2.4.3 Profitability

Myers and Majluf (1984: 188) predict that a negative relationship should exist between firm profitability and leverage. They contend that firms that are more profitable will prefer to use retained earnings, and thus will have lower debt ratios. However, the trade-off theory posits that, in order to take advantage of the interest tax shields associated with higher leverage, more profitable firms will have higher debt ratios. Similarly, the free cash flow theory hypothesises that profitable firms should issue more debt. This is a measure to bond the future cash flows and to discipline managers by paying out cash to bondholders instead of wasting the funds on negative NPV projects. The pecking order theory hypothesises that profitability is inversely related to leverage. In contrast, the trade-off and the free cash flow theories suggest that profitability is directly related to leverage.

A number of researchers have tested the effect of profitability on firm leverage. Kester (1986: 13) compares capital and ownership structure of manufacturing firms in the United States and Japan. The author finds that there is a negative relationship between profitability and leverage, measured in terms of the total debt to book and market value of equity. Rajan and Zingales (1995: 1453) and Wald (1999: 174) draw similar conclusions for the United States, United Kingdom and Japan.

Booth *et al.* (2001: 112) find a negative correlation between leverage and profitability for a sample of firms in emerging markets. This relationship is however, stronger than the Rajan and Zingales (1996: 1453) observation. Mutenheri and Green (2003: 166) find no significant relationship between leverage and profitability for firms in Zimbabwe. In fact, the observed coefficients for the fixed and random effects models are positive. Bauer (2004: 16) uses restricted OLS models to test the effect of profitability on leverage for Czech firms, and finds a negative and significant association between profitability and the debt ratio. Delcoure (2007: 411) uncovers statistically strong and negative correlations between profitability, measured as the return on total assets, and all measures of leverage. Chang, Lee and Lee (2009: 209) utilise the structural equation model to test the determinants of capital structure for firms in the Compusat industrial files. They confirm a

significant negative association between profitability (measured by the ratio of operating income to total assets) and all measures of leverage.

Strebulaev (2007: 1747) utilises dynamic trade-off models with adjustment costs and also shows that profitability is inversely related to book and market measures of leverage. Likewise, Gwatidzo and Ojah (2009: 9) find a negative and significant relationship for firms in South Africa and Ghana. The relationship for firms in Zimbabwe is only negative and significant for the short term debt ratio. The only exception is Nigeria where the coefficients are positive and significant for the total and long term debt ratio. This positive association confirms the trade-off and free cash flow theories of capital structure.

The evidence presented in the preceding discussion suggests that most firms in both developed and developing countries follow a pecking order in their financing decisions. These findings confirm the predictions of Myers and Majluf (1984: 188).

#### **2.4.4 Asset tangibility**

The general consensus among researchers is that asset tangibility is directly related to leverage. Jensen and Meckling (1976: 305) point out the possibility of risk shifting strategies whereby managers may shift to riskier investments at the expense of the bondholders. These agency costs of debt can be mitigated if the collateral value of assets is high. Hence, asset tangibility is likely to be positively associated with leverage. Furthermore, in the event of bankruptcy, a higher proportion of tangible assets could enhance the salvage value of the firm's assets. The lenders of finance are thus willing to advance loans to firms with a high proportion of tangible assets.

Haris and Raviv (1991: 341) observe that non-debt tax shields and firm assets are usually regarded as proxies for asset tangibility. Bradley *et al.* (1984: 873) use non-debt tax shields as a proxy for asset tangibility, and they find a statistically significant positive relationship between firm leverage and non-debt tax shields. Alternatively, Friend and Lang (1988: 277) use the ratio of net property, plant and equipment to total assets and they report a strong positive relationship between leverage and asset tangibility for both

closely held and public corporations. On the other hand, Titman and Wessels (1988: 16) incorporate the ratio of inventory plus gross plant and equipment to total assets and they confirm a positive association between collateral value and leverage.

Rajan and Zingales (1995: 1453) use both the book and market values of leverage and they report a positive and significant relationship between leverage and asset tangibility for firms in most of their sampled countries<sup>4</sup>. Booth *et al.* (2001: 112) observe a similar relationship for a sample of emerging market economies. In contrast, Mutenheri and Green (2003: 166) examine the determinants of capital structure for firms in Zimbabwe. They observe a strong negative association between asset tangibility and leverage for the pre reform period (1986-1990). However, a strong positive association is detected for the post reform period (1995-1999).<sup>5</sup> The negative association observed for the pre reform period could be associated with the lack of proper contract enforcement systems associated with underdeveloped capital markets. Therefore, asset tangibility may not be used actively as a criterion for advancing loans.

Abor and Biekpe (2005: 43) report a negative and significant relationship between asset tangibility and leverage for Ghanaian firms. They attribute this observation to the higher operating risk associated with a higher proportion of fixed assets. Huang and Song (2006: 30) perform robustness analyses by examining, *inter alia*, first difference regressions for Chinese firms and a strong positive correlation is observed between asset tangibility and leverage. Gwatidzo and Ojah (2009: 15) use fixed and random effects models and confirm a statistically significant positive relationship for firms in Nigeria and South Africa<sup>6</sup> suggesting that financiers in these countries require collateral to issue long term debt. Contrary to the predictions of the theory, Sheikh and Wang (2011: 127) document a strong negative correlation between book leverage and asset tangibility for listed manufacturing firms in Pakistan. The authors note that the negative association

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<sup>4</sup> There are two exceptions to this observation; when book values are used, the relationship is positive but insignificant for Italy, and when market values are used, a positive and insignificant association is observed for France

<sup>5</sup> This strong relationship is found using the fixed and random effects models. The pooled least squares approach yields no statistically significant results.

<sup>6</sup> The only exception for South Africa is the short term debt ratio, which is significantly negatively related to asset tangibility

could be due to the tendency for managers to “... empire build ...” at the expense of collateralised assets.

Overall, the empirical evidence discussed so far provides strong support for the positive association between asset tangibility and leverage predicted by capital structure theorists. A negative association is observed only in exceptional circumstances. This is because of the influence of the institutional environment on the providers of loan capital.

#### **2.4.5 Age**

Age plays a significant role on firms’ ability to acquire debt. Older firms are deemed to be more stable and thus more reputable due to their ability to survive over a longer period of time. Therefore, the prediction is that older firms will have more long term debt in their capital structures. Johnson (1997: 60) reports a significant positive association between age and publicly held debt for a set of firms drawn from the Compustat database. This suggests that the reputational capital held by older firms is sufficient to ensure that the risk of default on public debt is minimised.

Ojah and Manrique (2005: 463) document a positive but insignificant effect of this variable on corporate debt structures of Spanish firms. Gwatidzo and Ojah (2009: 15) find conflicting evidence for firms in five African countries. Particularly, age is strongly negatively correlated to leverage in Zimbabwe. A positive correlation is observed for Kenyan and Nigerian firms. The coefficients for South Africa are significantly positive only for long term debt and significantly negative for short term debt.

#### **2.4.6 Growth prospects**

Capital structure theories suggest that growth opportunities are correlated to firm financing behaviour. The general consensus among researchers is that growth opportunities are negatively related to leverage, principally because future growth prospects are intangible and hence cannot be easily collateralised (Barclay and Smith, 2005: 10). However, the effect of growth is dependent on the measure used to capture growth. Gupta (1969: 520)

uses the annual compounded growth rate in sales and finds that growth firms tend to have higher leverage than non-growth firms. This is partly due to their ability to access external finance in a relatively unconstrained manner.

Titman and Wessels (1988: 4) use the percentage change in total assets and they arrive at a similar conclusion for the ratio of long term debt to the book value of equity. This evidence is consistent with the prediction that growth firms add value to the firm and hence increase the firm's debt capacity. Delcours (2007: 414) pools data for firms in western European transition economies and fails to find a statistically significant association between firm growth prospects and leverage.

A contrary view is pointed out by Myers (1977: 150) who argues that firms with growth potential will tend to have lower leverage. This is because firms with intangible growth prospects will generally avoid debt to mitigate the potential loss underinvestment problem associated with financial distress. Eriotis *et al.* (2007: 324) concur with this viewpoint by positing that growth causes variations in the value of the firm. Larger variations are therefore interpreted as high risk. This presents a significant hurdle for growth firms to raise capital with more favourable terms. Rajan and Zingales (1995: 1453) use the market to book ratio of total assets to proxy growth opportunities and they find evidence supporting Myers' (1977: 150) prediction. Barclay and Smith (1999: 13) and Ngugi (2008: 620) reach the same conclusion for a sample of 6700 firms covered by Compustat and Kenyan firms respectively. On the contrary, Al Najjar (2011: 12) finds a positive relationship between leverage and growth opportunities (measured by the market to book ratio) for Jordanian firms. This finding is contrary to the predictions of Myers (1977: 150) suggesting that growth firms in Jordan prefer to finance investments with debt.

The preceding evidence shows that most studies that use the growth rate of assets as a proxy for firm growth opportunities tend to exhibit strong positive correlations. On the other hand, most studies that use some form of a market to book value of assets ratio reveal negative associations between growth and leverage. This is because growth in the asset base of a company provides an incentive for creditors to advance loans to growth firms.



Conversely, the market to book ratio reveals intangible growth opportunities which may not easily be collateralised.

#### 2.4.7 Corporate taxes

The introduction of taxes to the Modigliani and Miller (1958: 261) irrelevance model suggests that corporate taxes are a vital element in the determination of firm leverage. Modigliani and Miller (1963: 433) demonstrate that the tax savings associated with interest tax shields induce firms to take on more debt. Therefore, a positive association between tax and leverage should be observed. The bone of contention, however, has been to determine a reliable proxy for the tax rate. Most studies use the ratio of taxes paid to total taxable income and the empirical evidence has, at most, been conflicting.

Homaifar, Zietz and Benkato (1994: 1) utilise a general autoregressive distributed lag model to test Modigliani and Miller's (1963: 433) tax relevance predictions for both the short run and the long run. They document a long run positive relationship between leverage and corporate tax. However, no significant relationship is observed in the short run. Graham (2001: 41) uses a sophisticated simulation technique in an attempt to derive a more accurate measure of the effective tax rate and concludes that taxes affect leverage in a positive manner.

Negash (2002: 26) argues that, where there is a change in the tax regime, the use of simulation to estimate the effective tax rate may not be appropriate. In his study of firms operating in a tax regime where firms are not progressively taxed, he finds that taxes are negatively associated with leverage. This finding is confirmed by Abor and Biekpe (2005: 44) for Ghana. However, Ngugi (2008: 620) and Gwatidzo and Ojah (2009: 13) find insignificant correlations for Kenya and South Africa respectively. Likewise, Frank and Goyal (2009: 15) confirm strong negative correlations for the book value measures of leverage. However, strong positive associations are observed for the market value leverage ratios.

In summary, it appears that attempts to determine the effect of tax on leverage have yielded inconclusive results. While Modigliani and Miller's (1963: 433) prediction is confirmed by some studies, the negative association depicted in other studies cannot be ignored. It is therefore necessary to review the corporate tax debate in the context of non-debt tax shields.

#### **2.4.8 Non-debt tax shields**

The presence of non-debt tax shields such as depreciation, operating losses carried forward and investment tax credits in a firm's financial statements reduces the firm's tax bill, thereby lowering the effective tax rate. Recall that figure 2.2 shows that the effective tax rates in South Africa have been lower than the statutory rates. This observation can partly be explained by the use of non-debt tax shields in the South African corporate sector.

DeAngelo and Masulis (1980: 3) have illustrated that the tax advantages of debt are lower for those firms with opportunities to avoid tax through other related non-debt tax shelters such as depreciation, investment tax credits and tax loss carry forwards. It follows that firms with higher non-debt tax shields are less likely to issue more debt. Therefore, an inverse relationship is expected between non-debt tax shields and leverage.

Again, the empirical evidence regarding non-debt tax shields has yielded mixed results. For example, Bennet and Donnelly (1993: 54), Saa-Requejo (1996: 55), Wiwattanakantang (1999: 394), De Miguel and Pindado (2001: 77), Ozkan (2001: 187) and Ngugi (2008: 620) confirm the prediction of DeAngelo and Masulis (1980: 3) that non-debt tax shields are a substitute for debt. However, Bradley *et al.* (1984: 873), Barclay *et al.* (1996: 210) and Boyle and Eckhold (1997: 434)<sup>7</sup> provide evidence suggesting that non-debt tax shields have a positive impact on firm leverage. Chang *et al.* (2009: 209)

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<sup>7</sup> Boyle and Eckhold (1997: 434) report a positive correlation for the long term debt ratio for the pre liberalisation period and insignificant positive correlation for the post liberalisation period. The short term debt ratio is positively correlated to leverage for the pre liberalisation period and negatively correlated to leverage for the post liberalisation period.

confirm a positive association between leverage and non-debt tax shields for Compustat-listed non-financial corporations.

This contradiction is not surprising because of two main reasons provided by Barclay and Smith (2005: 15). Firstly, firms with higher non-debt tax shields have higher proportions of tangible assets in their balance sheet. This provides an increased potential to accumulate more debt. Therefore, non-debt tax shields may not only be a proxy for low taxes, but rather a proxy for low contracting costs associated with debt. Secondly, firms with tax loss carry forwards are often in financial distress. Consequently, the market value of equity for such firms is eroded thereby increasing the debt ratio. It is therefore not clear whether tax loss carry forwards are a reliable proxy for non-debt tax shields.

#### **2.4.9 Dividend policies**

Miller and Modigliani (1961: 411) have argued that dividend policy does not affect the value of the firm or the cost of equity. If this is true, then dividend policy is irrelevant. Pursuant to this proposition, several financial theorists have argued otherwise, that dividend policy is relevant. Lintner (1962: 243) and Gordon (1963: 264) have argued that investors value the next dollar of dividends more than future capital gains. In effect, the perceived riskiness of a dividend paying firm should be lower than that of a non dividend payer. Consequently, the required return of a dividend paying firm reduces with an increase in dividends. This proposition has been termed the “bird-in-hand theory”.

On the other hand, the introduction of market imperfections such as taxes into this debate could sway the argument to the other side. Boyle and Eckhold (1997: 431) reason that if capital gains are taxed lower than dividend income, then an increase in dividends will reduce the after tax return of shareholders who may in turn require a higher pre tax expected rate of return. Consequently, the increased cost of equity may induce firms to issue more debt relative to equity. In this case, dividend payout may be positively correlated with leverage.

If dividend policy is relevant, then the subsequent change in the market value of equity should affect capital structure. If the bird-in-hand theory holds, an increase in dividends should be inversely related to the debt ratio. The dividend relevancy argument is consistent with Jensen's (1986: 323) free cash flow hypothesis that increases in dividend and debt interest payments reduce the firm's free cash flows. Consequently, firms with higher dividend payments are forced to seek external financing from the capital markets. If more debt is issued, then dividend payout may be directly related to the debt ratio. If more equity is issued, then dividend payout may be inversely related to the debt ratio.

Empirical evidence on the relevancy of dividend policy has provided conclusive evidence on the dividend signalling theory, which suggests that dividend increases are associated with managements' confidence of future stability of cash flows. Specifically, Bhattacharya (1979: 259) and John and Williams (1985: 1053) predict a positive correlation between dividends and future cash flows. This prediction should translate to a positive association between dividends and shareholder wealth.

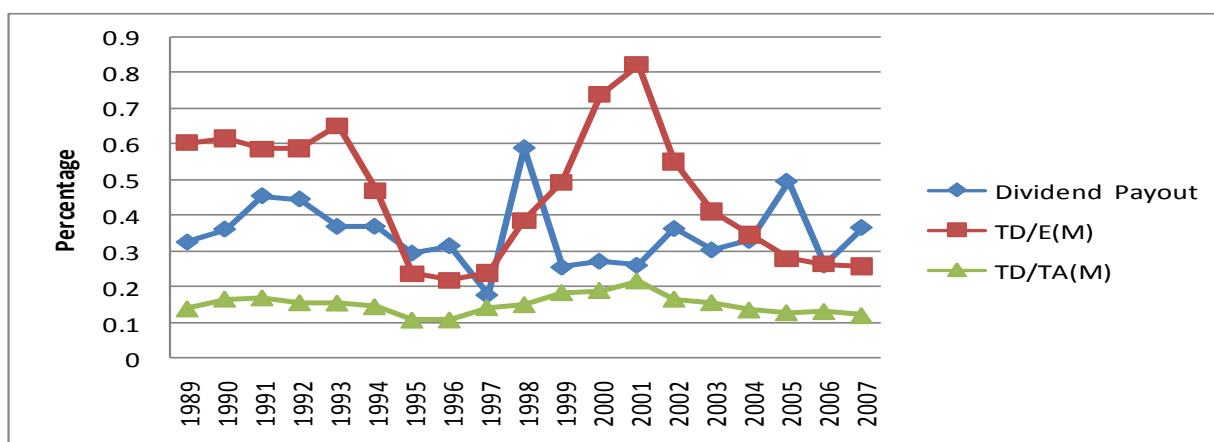
Woolridge (1983: 1618) examines unexpected dividend announcements for a sample of New York Stock Exchange (NYSE) listed firms and reports a statistically significant relationship between unexpected dividend changes and shareholder wealth. Dhillon and Johnson (1994: 282) report a positive association between large dividend increases and share prices and a simultaneous inverse relationship between bond prices and dividend changes. This finding is consistent with both the dividend signalling and the wealth redistribution hypotheses. If this is the case, the wealth redistribution observation builds a stronger case for the argument that dividend increases are negatively associated with leverage.

Grullon, Michaely and Swaminathan (2002: 387) have examined both the short and long term wealth effects of dividend changing firms and they find a significant increase in share prices for dividend increasing firms for both the short and long run. They attribute this positive wealth effect to a reduction in the systematic risk of dividend paying firms. This observation is consistent with Lintner (1962: 243) and Gordon's (1963: 264) "bird-in-hand" theory.

From a South African perspective, inspection of figure 2.3 suggests two schools of thought. Firstly, large dividend payments reduce firms' free cash flows thereby reducing funds available for investment projects. This forces corporate managers to seek additional finance from the capital markets. This conjecture is consistent with Jensen's (1986: 323) free cash flow hypothesis discussed earlier. Secondly, many listed firms use dividends as a credible signal that their future earnings prospects are sound. This gives them the incentive to seek further borrowing from the capital markets. An inspection of figure 2.3 shows that there was an increase in the dividend payouts in the year 1998. This spike in dividend payouts is followed by a general rise in the debt ratios in the following two years. Likewise, for the 1991 to 1997 period, it can be noted that declining dividend payouts are associated with lower debt ratios. From this viewpoint, dividend payout in South Africa may be positively associated with leverage.

The literature documented in the preceding discussion suggests a strong support for the dividend signalling hypothesis which is consistent with the "bird-in-hand" theory. This empirical evidence suggests that, dividend policy does matter. If this is the case, dividend changes may be negatively correlated with leverage. However, the South African perspective suggests that dividend payout may be positively associated with leverage.

**Figure 2.3: A comparison of dividend payouts and market value total debt ratios**



Source: Author's calculations from study data set

#### **2.4.10 Similarities in capital structure determinants**

Rajan and Zingales (1995: 1422) observe that the variables (asset tangibility, log of sales, profitability and market to book ratios) used to determine the choice of capital structure in the United States are similarly correlated in the other seven developed nations. For example, leverage increases with size in all countries, with the exception of Germany. The plausible reason for this finding is that larger firms have a lower possibility of financial distress. Booth *et al.* (2001: 117) perform a cross country analysis of capital structure determinants among developing countries, and they confirm that, despite the institutional differences, financing choices in developing countries are also affected by the same variables as in the developed countries.

To summarise, the evidence documented suggests that firm specific characteristics such as size, age, profitability, asset tangibility, growth prospects, taxes, non-debt tax shields and dividend policy have an impact on firm financing. Firm profitability tends to be negatively related to leverage. However, with regard to size, the evidence is mixed with some studies reporting a positive relationship between size and firm leverage, while others suggest that a negative relationship exists. Asset tangibility appears to be positively correlated to leverage and growth coefficients tend to be negative when the market to book ratio is used as a proxy for growth prospects.

The empirical evidence regarding taxes and non-debt tax shields is mixed, partly due to methodological differences and the nature of the tax regime within which firms operate. Dividend payout ratio is theoretically predicted to be negatively correlated to leverage due to the positive association between dividend payout and the market value of equity. The other pattern that is emerging is that variables used to determine the choice of capital structure are similar among developing countries and between developing and developed countries.

## **2.5 CORPORATE CAPITAL STRUCTURES AROUND THE WORLD**

This section distinguishes between the practice of corporate capital structures in developed and developing economies. Atkin and Glen (1992: 377) succinctly point out that there is no reason to suggest that firms in developed countries have different objectives from firms in the developing countries. However, because capital markets in the developing countries are less developed than the capital markets in the developed nations, there is reason enough to believe that capital structure behaviour may differ. The idea is to document notable differences in firm financing and to see whether patterns in financing exist across countries.

### **2.5.1 Corporate capital structures in the developed economies**

Numerous studies have documented the manner in which capital is structured in firms selected from different industrialised economies. For example, Marsh (1982: 121) empirically tests the choice between debt and equity for firms in the United Kingdom and finds some evidence that firms “appear” to have target levels of debt in mind. Borio (1990: 10) reviews capital structures of firms in industrialised countries and finds that, by international standards, leverage ratios in the United States are low, when the 1980s are taken into account. However, a closer inspection of the trend in financing reveals that, during this period, leverage ratios were rising at a “... fast rate...” Rajan and Zingales (1995: 1433) review the 1987-1991 period based on both book and market values, and they conclude that firms in Germany and the United Kingdom are relatively under levered compared to the United States.

In terms of internally generated funds, the first and perhaps most important observation made by a number of researchers is that firms in industrialised economies principally rely on retention of earnings as a dominant source of finance. For example, Mayer (1988: 1172) examines flow of funds data for non-financial firms in the United Kingdom for the period 1970 to 1985. He finds that retentions accounted for a large proportion of investment in the United Kingdom. Atkin and Glen (1992: 377) observe an increase in the use of retained earnings for firms in the United States in the post World War II era. They

argue that equity has never been the popular choice of finance among firms in the United States. This is mostly due to a high proportion of bond issues as opposed to equity during the post World War II era.

Corbett and Jenkinson (1996: 71) study corporate capital structures in Japan, Germany, United Kingdom and the United States. They confirm that the main source of finance for all countries in their sample was internal funds. Lemmon, Zender and Jaime (2010: 1161) review CRSP and Compustat listed firms for a period ranging from 1971 to 2001, and they confirm that firms in their sample principally rely on internally generated funds. These observations suggest that corporate managers consider information costs of issuing external finance when financing corporate investments.

Borio (1990: 4) observes that countries are either “high leverage” such as Japan, Germany and France, or “low leverage” such as Canada, the United Kingdom and the United States. However, there are some qualifications in respect to these observations. The results of the various studies on corporate capital structures are dependent on the measures of leverage. Rajan and Zingales (1995: 1430) argues that if leverage is measured as a ratio of debt to total assets at book values, then Canadian firms are the most highly geared at 36 percent, and the lowest being German firms at 20 percent. If market values are considered, then Italian firms have the highest gearing at 28 percent, and firms in the United Kingdom and Germany have the lowest gearing at 16 percent.

These findings lead Corbett and Jenkinson (1996: 71) to conclude that, if market values are used for leverage, both British and American firms are more highly geared than German firms. De Jong, Kabir and Nguyen (2008: 1957) perform a more extensive analysis of long term leverage of firms from 42 countries. They confirm the observation by Rajan and Zingales (1995: 1430) that German firms are the lowest geared among firms in industrialised economies (See figure 2.4).

Financial systems in different countries can either be classified as bank or market based financial systems. Bertero (1994: 69) states that the French system was until the mid 1980s classified as a bank based system. This is because of the over reliance on bank

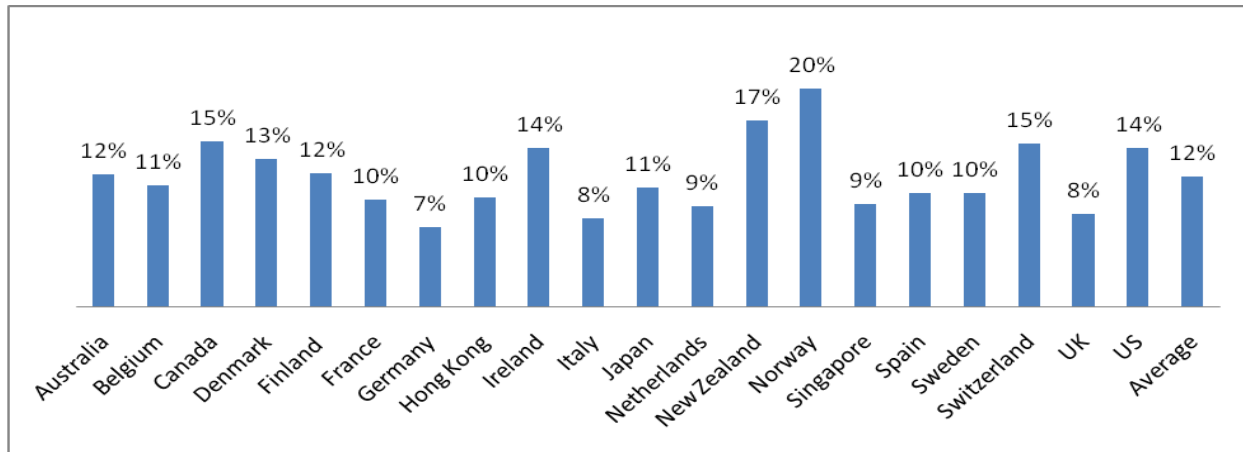


overdrafts by French firms as compared to their Japanese and German counterparts. However, French firms, have recently increased their reliance on retained earnings, as is the case in Japan, and reduced their reliance on short term debt with a further increased reliance on equity and bonds. This is a result of capital market efficiency brought about by reforms in the French capital market.

Although firms in the United States and the United Kingdom are situated in a market based financial system, Corbett and Jenkinson (1996: 76) report that the proportion of internal funds utilised by firms in the United States increased by 29.2 percent over a period of 19 years, from 1970 to 1989, while firms in the United Kingdom and the United States reduced their reliance on market based financial sources during this period. This has been attributed to financial innovation on the part of the financial institutions that operated during the period of study. Most recently, Antoniou, Guney and Paudyal (2008: 59) examine the dynamics of leverage for firms operating in these two financial systems and they conclude that leverage is largely influenced by the market conditions prevailing in the two financial systems.

A more comprehensive study by Lemon, Roberts and Zender (2008: 1605) reveals a surprisingly stable leverage pattern for a sample of non-financial Compustat listed firms for the period 1965 to 2003. Firms that are high (low) leverage maintain this pattern over time. They conclude that the variation in corporate capital structures is mostly driven by relatively stable factors over time.

**Figure 2.4: Long term debt ratios for firms from select industrialised countries**



**Source: De Jong, Kabir and Nguyen (2008: 1957)**

The evidence presented by the different studies shows that there are notable differences in leverage ratios for firms across the developed countries, and these differences are partly due to methodological differences. The pattern that is emerging is that, despite the differences in financing behaviour, firms in developed countries rely more on retained earnings than on debt and equity.

### **2.5.2 Corporate capital structures in the developing economies**

Data on corporate finance for firms in developing economies is scarce. However, the International Finance Corporation (IFC) embarked on a program to compile a database on balance sheet data for 50 of the largest publicly traded manufacturing firms in 9 developing economies for the period 1980 to 1988. This has made it possible for further analysis of financing patterns on the part of firms in developing economies. Atkin and Glen (1992: 371) utilise this database and find notably, that firms in developing economies operate in capital markets that are less developed and therefore access to finance is restricted to a few financing options.

There has been a fairly strong consensus among most researchers that firms in developing economies rely less on retentions and more on external finance. For example, Singh and Hamid (1992: 1) examine 50 largest manufacturing firms in nine developing countries by utilising balance sheet data, and they find more reliance on external finance

than on retentions. Singh (1995: 1) perform a more robust analysis by including a larger sample, and where possible, a longer time period. The results of the study confirm the findings of Singh and Hamid (1992: 1). Mutenheri and Green (2003: 159) document a similar phenomenon for the Zimbabwean corporate sector.

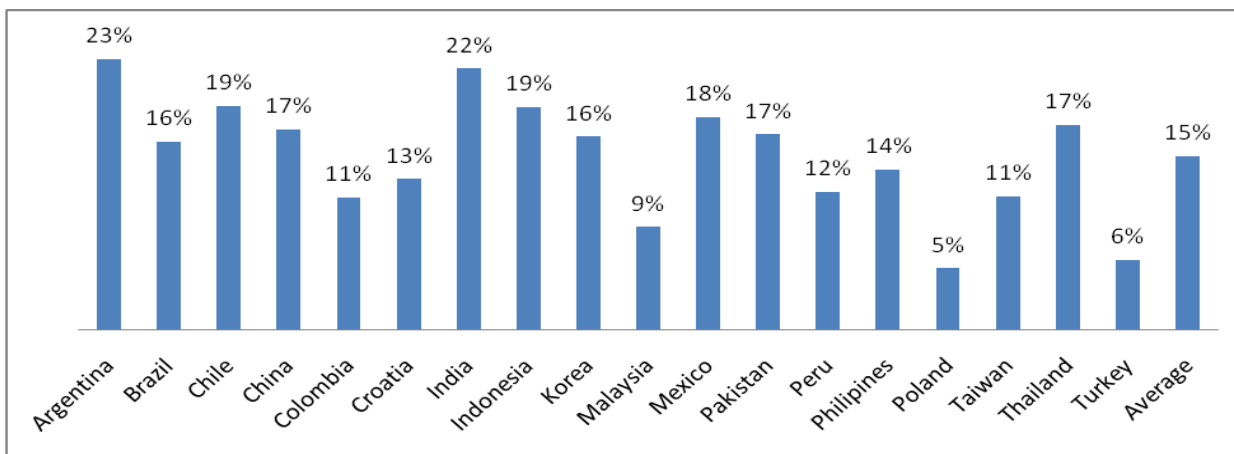
Cobham and Subramaniam (1998: 1035) examine the Singh and Hamid (1992: 1) sample for India by using net sources of finance data. They conclude that although capital structure patterns in India are similar to those of the Mediterranean countries there were considerable differences with the Anglo Saxon countries. This is mainly due to differences in the choice of methodology. De Jong *et al.* (2008: 1957) document long term leverage ratios for non African firms in emerging economies. An analysis of their data shows that the average non African firms in emerging economies is about 15 percent, which is higher than the 12 percent documented for firms in industrialised economies (see figure 2.5). This finding is contrary to the earlier observations made by Glen and Singh (2004: 162) that firms in emerging markets have lower leverage than their counterparts in the developed economies. However, these observed differences could be due to the measures of leverage used in the different studies.

Figure 2.6 shows the debt ratios for firms in five African countries. When total debt ratios are used, Nigerian firms tend to have the lowest debt. Ghanaian firms tend to have lowest long term debt ratios, an observation also noted by Abor and Biekpe (2005: 42). The average long term debt ratio for African firms is 11 percent, which is slightly lower than that of firms in other non African emerging economies. Another important finding from this analysis is that firms in Africa rely principally on short term debt, which averages 49 percent. Gwatidzo and Ojah (2009: 17) conclude that firms in African countries exhibit similar patterns of leverage to their counterparts especially in Brazil, Mexico, Thailand, South Korea, Jordan and Turkey.

The evidence on corporate capital structures in the developing countries indicates a non uniform pattern as per the different studies conducted at different times. This has mainly been attributed to each firm's unique circumstance and the data definitions. However, firms in developing countries rely less on internal financing and more on external

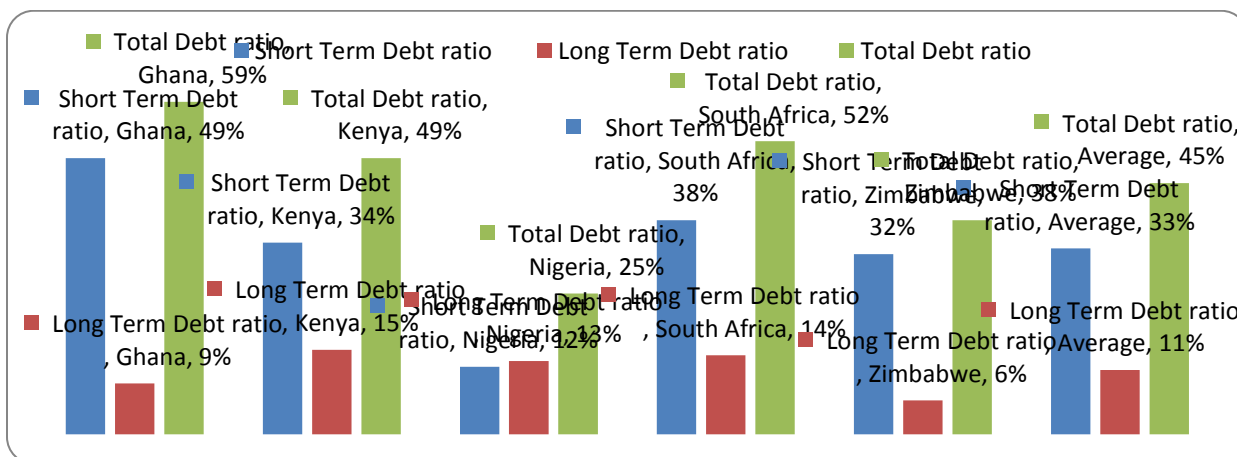
financing. Furthermore, firms in African countries exhibit similar levels of leverage to firms in other developing countries.

**Figure 2.5: Long term debt ratios for firms from select developing countries**



Source: De Jong *et al.* (2008: 1957)

**Figure 2.6: Debt ratios for select African countries**



Source: Gwatidzo and Ojah (2009: 7)

## 2.6 CHAPTER SUMMARY

This chapter has focused on the theory and practice of capital structure. The discussion commenced with the capital structure irrelevance debate. The train of thought in the capital structure irrelevance propositions has developed to a general consensus among researchers that there is an optimal capital structure. This is principally because as market

imperfections are introduced, managers will attempt to balance the tax benefits of debt against the present value of the costs of financial distress. The practical significance of this notion is that although debt presents a tax shield that translates to fairer market valuations, financial managers are aware of the dangers of excessive debt.

The main theories of capital structure have been discussed. These are the trade-off, agency, signalling and pecking order theories. Several reasons have been suggested on why the tests of the competing theories of capital structure fail to yield conclusive results. Firstly, it is difficult to include proxies for some variables that affect the optimal capital structure. Secondly, the theories cannot be reduced to a precise mathematical formula, but rather predict in qualitative terms, thus making them less reliable than asset pricing models. Lastly, the theories are not mutually exclusive.

A broad literature review on the factors that affect the choice of capital structure has been presented. The major factors that have been cited by researchers are legal, institutional and financial factors. Cross country studies also reveal that the choice of capital structure in developed countries is affected by the same variables.

The effect of firm characteristics on the capital structure of firms has also been documented. The researchers have found conflicting results on the correlation between size and leverage. The empirical relationship between profitability and leverage is mostly negative. Growth is usually negatively correlated to leverage when the market to book ratio is used and mostly positively related to leverage when growth in assets is used. Asset tangibility is usually positively correlated to leverage and evidence is mixed regarding the effect of age on firm leverage.

Finally, the pattern of capital structure for both the developed and developing countries has been discussed. Each country observed shows a unique pattern because of the circumstances that the firms in that particular regime are operating in. The main finding by the researchers is that debt levels in the sampled industrialised countries were relatively stable, with the exception of the United States. The other finding is that debt levels in bank based financial systems were higher than those in the market based financial systems.

From a developing economies perspective, firms rely more on external financing as compared to their counterparts in the developed world. The corporate capital structures in the developing countries indicate a non uniform pattern as per the different studies conducted at different times. This has been attributed to each firm's unique circumstance and the data definitions. The next chapter discusses the theory of financial liberalisation.

## CHAPTER 3

### THE THEORY OF FINANCIAL LIBERALISATION

#### 3.1 INTRODUCTION

McKinnon (1973: 9) and Shaw (1973: 9) have documented the importance of financial liberalisation in relation to economic growth. Ever since then, numerous studies have attempted to document the effects of financial liberalisation on, *inter alia*, economic growth, financing constraints, market integration, capital flows and capital structure. All these economic fundamentals are crucial in influencing firm financing behaviour. As a result, there is a need to synthesise the literature on financial liberalisation and its effects, to unfold the picture that is emerging out of previous studies. This analysis will provide a sound basis for formulating testable hypotheses.

##### 3.1.1 Goal of this chapter

The main goal of this chapter is to discuss the literature on the theory and implications of financial liberalisation. It begins by highlighting the case for financial liberalisation and provides contrasting empirical evidence on the effects of financial liberalisation. Next, the process of financial liberalisation is discussed together with its effects on capital flows, financing constraints and capital structure.

##### 3.1.2 Layout of this chapter

The rest of this chapter is organised as follows: Section 3.2 defines the concept of financial liberalisation. Section 3.3 presents arguments for and against financial liberalisation. Section 3.4 articulates the process of financial liberalisation by highlighting the multifaceted nature of financial reforms. Section 3.5 deals with the effects of financial liberalisation on capital flows, credit constraints and capital structure of firms. Section 3.6 provides an analysis of the dating of financial liberalisation. Section 3.7 concludes the chapter.

### **3.2 WHAT IS FINANCIAL LIBERALISATION?**

Auerbach and Siddiki (2004: 231) define financial liberalisation as the elimination of a series of impediments in the financial sector in order to bring it in line with that of the developed economies. There are principally three types of financial liberalisation. Firstly, this term may be used to describe domestic financial sector reforms such as privatisation and increases in credit extension to the private sector. For example, Gelos and Werner (2002: 1) examine how domestic manufacturing firms in Mexico have responded to these types of reforms.

Secondly, financial liberalisation may be used to refer to stock market liberalisation. In this case, stock market liberalisation occurs when a country opens up its stock markets to foreign investors, at the same time allowing domestic firms' access to international financial markets (Bekaert and Harvey, 2003: 5).

Finally, financial liberalisation may refer to the liberalisation of the capital account. This is a situation where special exchange rates for capital account transactions are relaxed (Loots, 2003: 237), where domestic firms are permitted to borrow funds from abroad (Schmukler and Vesperoni, 2006: 183), and where reserve requirements are lowered (Kaminsky and Schmukler, 2008: 259).

### **3.3 DOES FINANCIAL LIBERALISATION MATTER?**

The concept of financial liberalisation stems back from McKinnon (1973: 9) and Shaw (1973: 9), who attribute economic development in developing countries to financial liberalisation. McKinnon (1973: 9) argues that financial liberalisation is a necessary ingredient in the generation of high saving rates and investment. Shaw (1973: 9) further argues that the subsequent real growth in the financial institutions provides domestic investors with the incentive to borrow and save, thus enabling them to accumulate more equity thereby lowering the cost of borrowing. The same view is echoed by Gibson and Tsakalos (1994: 578) who argue that financial liberalisation is necessary for financial



markets to operate efficiently and to provide new opportunities for financing in the existing economy.

Eichengreen (2001: 342) observes that restrictions on capital mobility shelter the financial institutions from foreign competition and that these capital controls “...vest additional power with bureaucrats who may be even less capable than markets at delivering an efficient allocation of resources ...” However, Gibson and Tsakalos (1994: 579) do not regard all forms of government intervention as financial repression needing to be liberalised. They suggest a better understanding of how financial markets in the developing countries operate, and which aspects of the financial markets are pertinent.

There have been some concerns that have been raised by researchers about the effects of financial liberalisation. For example, Eichengreen and Leblang (2003: 205) utilise data set for 21 countries ranging from 1887 to 1997, and they find weak evidence that financial liberalisation leads to growth. Nyawata and Bird (2004: 289) warn that the liberalisation of domestic interest rates could lead to excessive borrowing, which may jeopardise profitable investment opportunities. Recognising that financial liberalisation has its own limitations, McKinnon (1989: 53) believes that it is still “... the only game in town ...” in the view of achieving economic development.

Lee and Shin (2008: 106) dissect the effects of financial liberalisation into direct and indirect effects. The direct effects are clearly the benefits that arise in terms of the removal of frictions in the markets, thus leading to lower borrowing costs. The indirect effects are the negative impacts leading to crises. Although they find that the probability of crises occurring is two percentage points, the net effect, which combines the direct and indirect effects, leads to positive economic growth.

Given the slower pace of economic transitions, Henry (2007: 891) argues, firstly, that cross-sectional regressions applied by many studies fail to capture the true impact of financial liberalisation on growth. Secondly, in the case of instantaneous integration of markets, cross-sectional regressions designed to test long run growth may not be suited for measuring the short-run changes in market convergence.

Fry (1997: 759) identifies some of the key prerequisites for successful financial liberalisation; these are effective supervision of commercial banks, price stability, fiscal discipline enhanced by sustainable domestic borrowing by governments, adequate competition by commercial banks in a profit-maximising environment and a non-discriminatory tax system on financial intermediaries.

The evidence reviewed thus far suggests that the McKinnon (1973: 9) and Shaw (1973: 9) propositions have been met with mixed empirical evidence. The impact of financial liberalisation on economic growth is mainly conditional. Table 3.1 sums up some of the conditions found in recent studies on the effects of financial liberalisation on economic growth. The next section articulates on the process of financial liberalisation.

**Table 3.1: Conditions for positive economic growth**

<b>Studies</b>	<b>Conditions for positive effect on growth</b>
Edison, Levine, Ricci and Slok (2002: 749)	Macroeconomic stability
Loayza and Rancière (2002: 1)	Long run economic growth is dependent of the deepening of capital markets
Eichengreen and Leblang (2003: 205)	Well functioning financial markets and competition among financial institutions, which in turn leads to the efficient allocation of resources and faster economic growth
Fratzscher and Bussière (2004: 1)	The quality of domestic political institutions, size and structure of capital inflows
Bonfiglioli and Mendicino (2004: 1)	Institutional development
Klein (2005: 1)	The quality of the domestic financial institutions
Klein and Olivei (2008: 861)	Well developed institutions and sound macroeconomic policies. A thorough understanding of the institutional and macroeconomic environment is required.

### **3.4 THE PROCESS OF FINANCIAL LIBERALISATION**

#### **3.4.1 The multifaceted nature of financial liberalisation**

The process of financial liberalisation is a complex one (Demirguc-Kunt & Levine (1996: 292), Bekaert, Harvey & Lumsdaine (2002a: 204) and Bekaert & Harvey, (2003: 5)). This is because financial liberalisation generally occurs in line with other macroeconomic reforms aimed at developing the domestic financial market. Bandiera, Caprio, Honohan and Schiantarelli (2000: 239) acknowledge the multifaceted nature of reforms that occur in line with financial liberalisation. They also point out that, in some cases, the process of financial liberalisation involves reversals in capital inflows.

Henry (2000a: 532) approaches the study of the impact of stock market liberalisation on emerging-market equity prices with caution. Owing to its complexity, he controls for reforms such as trade liberalisation, exchange control relaxation and privatisation. In the South African context, the liberalisation of the financial markets was accompanied by various political and economic developments. Makina and Negash (2005a: 149) note that the negotiations that led to the unbanning of the ANC in February 1990, also led to the first democratic elections in April 1994. They argue that these developments brought anticipation for the full opening of the JSE in March 1995.

According to Kaminsky and Schmukler (2008: 259), complete liberalisation is accomplished when at least two sectors in the domestic economy are fully liberalised, and one sector is partially liberalised. Partial liberalisation occurs when at least two sectors are partly liberalised.

### **3.4.2 Financial liberalisation and market integration**

Bekaert and Harvey (2003: 4) observe that financial liberalisation leads to market integration with the global equity markets. Therefore, assets in the integrated markets should exhibit similar expected returns. However, in practice, markets may not be fully integrated. For example, French and Poterba (1991: 222) and Tesar and Werner (1995: 467) find that the benefits of risk sharing across integrated markets have not been fully exploited, thus leading to a home bias inherent in national investment portfolios. In fact, Bekaert and Harvey (2003: 4) argue that the home asset preference phenomenon has led many economists to believe that even well-developed capital markets are still not fully integrated. The next section discusses the effects of financial liberalisation on capital flows, financial constraints and capital structure.

## **3.5 THE EFFECTS OF FINANCIAL LIBERALISATION**

This section analyses the literature on the various effects of financial liberalisation. Firstly, the effect of financial liberalisation on the evolution of capital flows is reviewed. Secondly, the issue of whether financing constraints are eased by financial liberalisation is documented. Finally, the literature on the effects of financial liberalisation on capital structure is analysed.

### **3.5.1 Financial liberalisation and capital flows**

The removal of restrictions on cross country capital mobility results in increases in capital inflows. Bekaert, Harvey and Lumsdaine (2002b: 297) find that, as investors rebalance their portfolios, net capital inflows increase sharply in the first three years following financial liberalisation. However, they note that these capital inflows level off thereafter. Fernandez-Arias (1996: 414) cites low international interest rates as one of the reasons for the observed sharp increases in capital flows.

Ferreiro, Correa and Gomez (2008: 57) focus on the evolution of private capital inflows to Latin American economies, and they conclude that financial liberalisation alone does not lead to higher sustained capital outflows. The process must be reinforced by other institutional reforms. For example, Levine (2001: 689) maintains that the presence of international banking institutions in the liberalised economy contributes to the overall efficiency of the banking system, thereby boosting economic growth.

### **3.5.2 Financial liberalisation and financing constraints**

A number of studies have examined the effects of financial liberalisation on financing constraints. The evidence is at most mixed, mainly because each sample is uniquely affected by the regulatory and institutional differences in the respective country. Guncavdi *et al.* (1998: 443) assess the impact of financial liberalisation on the dynamics of private investments in Turkey. Their estimate of the Euler equation model suggests that credit constraints were not significantly affected after financial liberalisation. One would expect investment to be more responsive to the reduction in the cost of capital. The authors find this result to be puzzling, citing lack of clarity of the real cost of borrowing in a high inflation environment as a possible reason for this phenomenon.

Habibullah and Smith (1999: 259) extend the Euler equation model to test whether financial liberalisation reduces financing constraints for 10 developing countries in Asia. With the exception of South Korea, they confirm that financial liberalisation does not reduce financial constraints. Harrison, Love and McMillan (2004: 269) provide a possible explanation to these findings. They postulate that incoming foreign investors may borrow excessively in the domestic financial sector, thereby restricting credit constraints further. Gelos and Werner (2002: 1) conduct a firm level analysis on Mexican firms and they find that, as the economy becomes liberalised, smaller firms become less constrained compared to the larger firms. Laeven (2003: 5) draws similar conclusions for a panel of firms from 13 developing countries. Bhadhuri (2005: 704) finds contrasting results for India, where smaller firms were more financially constrained after financial liberalisation. The plausible reason given for this is the withdrawal of participation by the Indian government in resource allocation.

Ozatay and Sak (2002: 14) find a sluggish adjustment of credit allocation in response to financial sector reforms in Turkey. This is due to the increase in the volatility of interest and exchange rates, thus causing banks to be more cautious in their lending practices. Harrison *et al.* (2004: 269) examine two aspects of global capital flows, viz. foreign direct investment and portfolio investment. They find that foreign direct investment has a significant effect on reducing the host country's credit constraints. These results are significant for non-G7 countries. They find no significant effect of portfolio investment on firm financing constraints. They argue that this finding is justifiable because portfolio flows are short-term and volatile, and they do not necessarily imply a direct injection of foreign funds to the firm.

Hübler *et al.* (2008: 393) study the effects of financial liberalisation on Thai firms and they find that financial liberalisation reduces the cost of borrowing as it lowers interest rate spreads and requirements on loan collateral. These results are not surprising, because at the time of the study, the Thai economy was dominated largely by commercial banks.

If there is a reduction in credit constraints, there is a possibility that in some cases, financial liberalisation may lead to excessive borrowing. As observed by McKinnon and Pill (1997: 189), financial liberalisation may cause excessive foreign borrowing by firms. This may lead to the withdrawal of credit extension by foreign investors thereby increasing the probability of a financial crisis. For example, the authors cite Argentina, Chile and Mexico as victims of financial reforms, which initially increased capital inflows followed by an economic downturn.

Kaminsky and Reinhart (1999: 473) confirm that financial liberalisation fuels capital inflows, and often this precedes banking crises. As observed by Hübler, *et al.* (2008: 339), the ease of access to more debt increases the riskiness of the banking system. Specifically, their study reveals that, after financial liberalisation, bank risk management systems were not upgraded, and less caution was taken by banks in the process of credit allocation. This is a stark contrast to the findings of Ozatay and Sak (2002: 6), who find that banks applied more caution in their lending practices. This is because of the increased risk and volatility of interest and exchange rates.

The problem of excessive debt is further exacerbated by a reversal of net capital inflows after financial liberalisation. As elaborated by Eicher, Turnovsky and Walz (2000: 19), financial market deregulation leads to investment booms at the initial stage. As the economy slows down, capital inflows are offset by rising capital outflows. Eicher and Hull (2004: 443) attribute the high levels of indebtedness to capital flow reversals which are associated with financial liberalisation.

In sum, it appears that the effect of financial liberalisation on financial constraints is dependent on specific factors that are unique to the country being studied. On balance, the evidence points towards a reduction in borrowing constraints. This leads to further borrowing by domestic firms, a situation that may lead to financial crises.

### **3.5.3 Financial liberalisation and capital structure**

The primary motivation for financial liberalisation is documented by Schmukler and Vesperoni (2001: 1) who argue that globalisation of the financial markets develops the financial system, improves transparency, market discipline and financial infrastructure. This creates new investment and financing opportunities for domestic firms. For example, Demircuc-Kunt and Maksimovic (1996: 341) empirically test the association between stock market development and financial structure for 30 countries, including South Africa. They find a substitution of equity for debt financing for developed countries, and the opposite effect for developing nations. In particular, large firms become more leveraged, whereas small firms become relatively unaffected by stock market development.

Gallego and Loayza (2000: 1) examine, among other issues, whether financial liberalisation and stock market development affect the importance of debt over equity for firms in Chile. They find that stock market development leads to an increase in the use of equity relative to debt, whereas a larger size and activity of the banking sector induces a substitution of debt over equity. The more puzzling finding was that access to the international equity markets appears to increase the debt-equity ratio. They argue that this is due to the overall perceived creditworthiness of ADR issuers, thereby creating more room for the further use of debt.

Bhaduri (2000: 413) examines financing choices for Indian firms and finds that financial liberalisation reduces the marginal propensity to debt for all sizes of firms. The decline is, however, more pronounced for large mature firms. This finding suggests that financial liberalisation affects firm financial choices differently. In a cross country analysis, Schmukler and Vesperoni (2006: 186) find that firms with access to foreign debt and equity markets access more long-term debt as compared to firms that rely more on domestic financing. They conclude that financial liberalisation causes a wedge between internationally financed and domestically financed firms.

Flavin and O'Connor (2010: 202) explore the effects of stock market liberalisation on firms' financial structure in 31 emerging markets. They contrast between cross listing on a United States and United Kingdom stock exchange and domestic reforms and corporate governance improvements. They conclude that in both cases, stock market liberalisation lowers the debt to equity ratio.

The advent of the public debt market in South Africa is an additional transition in the financial liberalisation process. Before the Bond Exchange of South Africa (BESA) was introduced, firms had a limited choice in obtaining external finance. Typically, the main two sources were equity and the private debt, especially from banks. Because of this wider choice, Ojah and Pillay (2009: 1215) argue that competition in the capital markets increases, thus affecting the debt and capital structure of South African firms. In their sample of public and non public debt issuing firms, they find that, after issuance, the cost of capital for public debt issuing firms is lower than that of non public debt issuing firms. One would argue that this places public debt issuing firms in a better position to access more external finance.

The evidence reviewed thus far suggests that the choice of financial structure is clearly affected by financial liberalisation. Firm characteristics play a great role in determining the choice of capital structure. For instance, large firms are affected differently from smaller firms, and that firms with access to international equity markets are also affected differently from domestically financed firms. On balance, most of the evidence points towards an increase in the use of equity relative to debt.



### 3.5.4 Summary of the effects of financial liberalisation

Table 3.2 summarises the effects of financial liberalisation on capital flows, financial constraints and capital structure. The next section deals with the dating of financial liberalisation.

**Table 3.2: Summary of the effects of financial liberalisation**

		Changes in dependent variables		
Authors	Countries Sampled	Capital flows	Financial Constraints	Capital Structure
Bekaert, <i>et al.</i> (2002a: 297)	20 emerging markets	Increase		
Ferreiro, Correa and Gomez (2008: 57)	Latin America	Does not lead to higher sustained inflows		
Guncavdi, Bleaney and McKay (1998: 443)	Turkey		Not significantly affected	
Habibullah and Smith (1999: 259)	10 Asian countries		Not significantly reduced	
Gelos and Werner (2002: 1)	Mexico		Smaller firms become less constrained	
Laeven (2003: 5)	13 developing countries		Smaller firms become less constrained	
Bhadhuri (2005: 704)	India		Smaller firms become more constrained	



Ozatay and Sak (2002: 14)	Turkey		Sluggish adjustment to credit allocation	
Harrison <i>et al.</i> (2004: 269)	Developed and developing countries, including South Africa		Significant reduction in credit constraints attributed to FDI and not portfolio flows	
Hübler, <i>et al.</i> (2008: 393)	Thailand		Reduction in borrowing costs	
Demirguc-Kunt and Maksimovic (1996: 341)	30 developed and developing countries, including South Africa			Increase in leverage ratios for firms in developed countries. Decrease in leverage ratios for large firms in developing countries
Gallego and Loayza (2000: 28)	Chile			Increase in equity over debt; Larger size of banking sector induces substitution of debt over equity; Access to international markets lowers

				debt to equity ratio
Bhaduri (2000: 413)				Reduces marginal propensity to debt; Effect more pronounced for larger firms
Schmukler and Vesperoni (2001: 1)	East Asian and Latin American firms			Lowers debt to equity ratio for Latin American firms
Schmukler and Vesperoni (2006: 186)	Seven emerging economies in East Asia and Latin America			Debt maturity increases for firms with access to and equity markets
Flavin and O'Connor (2010: 202)	31 emerging economies			Lowers the debt to equity ratio

### 3.6 THE DATING OF FINANCIAL LIBERALISATION

The dating of financial liberalisation has not been easy to test, because of several reasons. Firstly, Makina (2005: 76) acknowledges that financial liberalisation can be seen as a gradual process. This is due to leakage of information prior to the announcement date, hence markets respond by anticipating the announcement. For example, the unbanning of the ANC in 1990 spurred anticipation that sanctions on South Africa will be lifted. The sequence of events leading to the first democratic elections in 1994 must have

also brought about some anticipation for the official opening up of the JSE to foreigners in March 1995.

Secondly, Bekaert and Harvey (2003: 8) argue that investment constraints are not binding, as there are ways of circumventing this through country funds or ADRs. Finally, Kaminsky and Schmukler (2008: 257) argue that focusing on one aspect of the financial market may distort the overall picture. This is due to the effect of controls across the various segments of the financial markets.

Having said this, various researchers have approached the issue of the dating of financial liberalisation in a fragmented manner. For example, Demirguc-Kunt and Detragiache (1999: 303) use the liberalisation of domestic interest rates as a measure for domestic financial sector liberalisation. Kaminsky and Schmukler (2008: 259) use the same approach by analysing regulations on deposit and lending rates. In terms of stock market liberalisation, the dominant measure is when foreigners are allowed to buy shares of domestic listed firms.

Frankel and Schmukler (2000: 177) and Edison and Warnock (2003: 83) determine financial integration by observing economic fundamentals in contrast to the existence of government controls. This has largely been made possible by data compiled by the IFC, specifically with information regarding dates of the establishment of country funds and depository receipts. Fuchs-Schundeln and Funke (2003: 730) assess the impact of stock market liberalisation on financial development for 27 countries, and they use official liberalisation dates by policy decree. Their choice of dates is influenced by the study of Bekaert (1995: 98), who also uses regulatory dates.

The choice of the date of financial liberalisation should be influenced by the nature and objective of the study. For example, Makina and Negash (2005b: 64) observe that studies with high-frequency data tend to use dates that indicate early signs of liberalisation while studies that examine real effects on the economy tend to use dates where there is a significant change in the data.

Three different dates have been used by several researchers to date the liberalisation of the JSE. Brooks, Davidson and Faff (1997: 255) use 2 February 1990, the date when the then president F.W. De Klerk made some announcements on dismantling the apartheid regime. They find this date to be appropriate because they were testing the effects of political announcements on the volatility of the JSE.

Fuchs-Schundeln and Funke (2003: 730) examine the effects of stock market liberalisation on macroeconomic development, and they use March 1995, the date when the JSE was officially opened to foreigners. Bekaert, Harvey and Lundblad (2005: 3) study the effects of equity market liberalisations on economic growth and they use 1996, the year after the official liberalisation date of the JSE.

Makina and Negash (2005b: 61) test for structural breaks around the two dates provided by Fuchs-Schundeln and Funke (2003: 730) and Brooks *et al.* (1997: 255). They include 1992 as the third date in their analysis, a date which was formally proposed by Bekaert *et al.* (2001: 465). This date is chosen because by the end of 1992, most economic sanctions on South Africa were lifted. Structural breaks around the three dates are detected by utilising the Chow test and the Broken Trend Stationary (BTS) test formalised by Perron (1989: 1361). They confirm significant structural breaks in stock market data for February 1990 and December 1992.

Ironically, no structural break is detected for March 1995, the official liberalisation date of the JSE. Makina and Negash (2005b: 61) conclude that political and economic policy concerns were significant determinants to stock market liberalisation compared to direct legal barriers. This finding suggests that there was much anticipation for the full opening of the JSE, following major political developments in the early 1990s.

Table 3.3 compares the liberalisation dates for emerging economies used by different researchers. It is evident that the process of financial liberalisation occurs between the late 1980s and early 1990s.

**Table 3.3: A comparison of liberalisation dates for a sample of emerging economies**

Country	Liberalisation dates and references				
	Henry (2000b: 301)	Kim/Singal (2000: 45)	Bekaert/ Harvey (2000: 565)	Bekaert <i>et al.</i> (2001: 465)	Fuchs Schundeln- Funke (2003: 757)
Argentina	11/89	11/89	11/89	11/89	11/89
Brazil	03/88	05/91	05/91	05/91	05/91
Chile	05/87	10/89	01/92	01/92	01/92
Colombia	12/91	02/91	02/91	02/91	02/91
Egypt				97	
Greece		08/86	12/87	12/87	12/87
India	06/86	11/92	11/92	11/92	11/92
Indonesia		09/89	09/89	09/89	09/89
Jordan		01/78	12/95	12/95	12/95
Korea	06/87	01/92	01/92	01/92	01/92
Malaysia	05/87	Before 12/75	12/88	12/88	12/88
Mexico	05/89	05/89	05/89	05/89	05/89
Morocco					04/94
Nigeria		Still Closed	08/95	08/95	08/95
Pakistan		02/91	02/91	02/91	02/91
Peru					11/91
Philippines	05/86	03/86	06/91	06/91	06/91
Portugal		07/86	07/86	07/86	07/86
<b>South Africa</b>				<b>92</b>	<b>3/95</b>
Spain				85	5/85
Sri Lanka				92	1990
Taiwan	05/86	01/91	01/91	01/91	01/91

Thailand		08/88	09/87	09/87	09/87
Turkey		08/89	08/89	08/89	08/89
Venezuela	01/90	01/90	01/90	01/90	01/90
Zimbabwe		07/93	06/93	06/93	06/93

**Source: Fuchs-Shundeln and Funke (2003: 757).**

### 3.7 CHAPTER SUMMARY

This chapter has discussed the theory and implications of financial liberalisation. It commences with the arguments for and against financial liberalisation. Counter arguments regarding the imperative for financial liberalisation provide conflicting evidence that financial liberalisation leads to economic growth.

In spite of this lack of consistent evidence, several recommendations are made on the conditions for successful financial liberalisation. Some of these recommendations include effective supervision of commercial banks, price stability, fiscal discipline that is enhanced by sustainable domestic borrowing, adequate competition by commercial banks in a profit-maximising environment, institutional development, macroeconomic stability and a non-discriminatory tax system on financial intermediaries.

The effects of financial liberalisation have been discussed with emphasis on capital inflows, financing constraints and capital structure. It has been argued that financial liberalisation leads to an increase in net capital inflows. Pursuant to this, there are certain implications that are inevitable. Firstly, that the capital inflows are not sustainable for periods more than three years, unless they are reinforced by other institutional reforms. Secondly, capital inflows may lead to excessive borrowing thus increasing the probability for financial crises.

The effects of financial liberalisation on credit constraints have been discussed. The general consensus is that financial liberalisation has no significant effect on credit constraints. There are basically two main reasons that have been advanced in respect to this general finding. Firstly, in countries where inflation was high during the period of

assessment, the lack of clarity of the real cost of borrowing has been cited as a possible reason. Secondly, incoming foreign investors may borrow excessively in the domestic financial sector thereby restricting credit constraints further.

Evidence is mixed regarding the effects of financial liberalisation on the capital structure. Despite this, reviewed evidence tends to point towards a substitution of equity for debt, especially for the developing countries. This is because of increased portfolio flows into the previously restricted capital market. It has also been found that large firms access more long-term financing as compared to their smaller counterparts.

This chapter concludes with a discussion on the dates that have been used previously by researchers as a benchmark for testing the effects of financial liberalisation. Because financial liberalisation is a gradual process, the dating may be a difficult issue. Most studies utilise dates of official liberalisation of the stock market by policy decree while other studies use the dates when an event occurred. These dates have also been tested in order to determine whether there was a structural shift in financial time series and February 1990 and December 1992 were confirmed for South Africa. The next chapter focuses on the formulation of research hypotheses.



## CHAPTER 4

### HYPOTHESIS DEVELOPMENT

#### 4.1 INTRODUCTION

The preceding chapters have detailed the theory and evidence of capital structure and financial liberalisation. The discussions that have emanated from these chapters clearly provide a basis for developing testable hypotheses.

##### 4.1.1 Goal of this chapter

The main goal of this chapter is to formulate testable hypotheses based on the theoretical and empirical issues discussed in the preceding chapters.

##### 4.1.2 Layout of this chapter

The rest of the chapter is organised as follows: Section 4.2 provides a description of the hypothesis development and lists each hypothesis based on the developments of the literature in the preceding chapters. Section 4.3 concludes the chapter.

#### 4.2 HYPOTHESES DEVELOPMENT

The research problem and objectives highlighted in this chapter provide a suitable basis to formulate testable hypotheses. This section provides an extensive analysis of the empirical and practical justification for each hypothesis. The first seven hypotheses focus on the impact of the various aspects of financial liberalisation on the dependent variables. The eighth hypothesis focuses on whether there are structural shifts in equation parameters following financial liberalisation.

#### 4.2.1 Hypothesis one

Hypothesis one is developed based on two main aspects relating to the dynamics of firm leverage. The first aspect is based on the empirical finding that at both the aggregate and firm level, stock market liberalisation lowers the cost of equity capital.<sup>8</sup> This finding has three implications that may suggest a reduction in leverage. Firstly, if the cost of equity capital reduces, then equity prices should increase (Henry, 2000a: 529). Assuming that future cash flows are held constant, leverage ratios should decrease.

Secondly, because of the reduction in the cost of equity capital, firms' investment in projects should increase (Henry, 2000b: 301), particularly because some of the projects with a negative net present value will be accepted due to the lower cost of capital. The expected increase in the investment should be financed by, *inter alia*, an increase in equity issues. This dynamic shift in financing should affect the capital structure of listed firms on the JSE.

Finally, because of the lower cost of equity capital, domestic firms should have more access to the equity market (Bhaduri, 2000: 413). Because of these implications, it is expected that leverage ratios should decrease following financial liberalisation.

The second aspect is based on the widening and deepening of the private and public debt markets. The opening of the public debt market and the increase in the participation of foreign banks provided a viable alternative for firm financing. Before the opening up of the BESA and the JSE, the choice of financing was limited mainly to private debt and equity. Because of this wider choice, Ojah and Pillay (2009: 1215) have argued that competition in the capital markets increases, thus affecting the debt and capital structure of South African firms. In their sample of public and non-public debt issuing firms, they find that, after issuance, the cost of capital for public debt issuing firms is lower than that of non-public debt issuing firms. If this is the case, we should expect firms to have more access to debt.

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<sup>8</sup> See Stapleton and Subrahmanyam (1977: 307), Stulz (1990: 3), Henry (2000a: 529), Bekaert and Harvey (2003: 3), and Makina and Negash (2005a: 154).

Hübler, *et al.* (2008: 393) find that following financial liberalisation, interest rate spreads reduce, thus indicating lower borrowing costs. If a reduction in credit constraints is experienced, there is a possibility that in some cases, financial liberalisation may lead to excessive borrowing. McKinnon and Pill (1997: 189) caution that financial liberalisation may cause excessive foreign borrowing by firms. If this is the case then it is expected that the debt proportion for listed firms should increase.

One would argue that the presence of an active public debt market contributes to higher levels of leverage. Therefore, the expected reduction in borrowing constraints, coupled with a growing private and public debt market, should contribute to the increase in domestic firms' debt levels. Based on the aforementioned facts, the null ( $H_0$ ) and alternative hypotheses ( $H_a$ ) can be stated as follows:

**$H_0$  = Stock market liberalisation has no significant impact on the book and market value leverage ratios for all sets of listed firms.**

**$H_a$  = Stock market liberalisation has a significant impact on the book and market value leverage ratios for all sets of listed firms**

#### 4.2.2 Hypothesis two

Hypothesis two is formulated on the assumption that direct legal barriers are not the only factors impacting on firms' choice of debt. To capture the effect of some other prominent economic and political influences on the capital structure of firms, the lifting of international sanctions on South Africa is considered as a possible influence on firm financing choices. Bekaert *et al.* (2001: 465) and Makina and Negash (2005a: 150) use the end of 1992 to capture the effects of the lifting of economic sanctions on the JSE. It is envisaged that the lifting of international sanctions reduces the country-specific risk. Investors will therefore require a lower rate of return on equities. From these arguments, it is hypothesised that the re-integration of the economy with the world markets lowers the cost of equity capital and subsequently increases equity prices. To this effect, debt ratios should reduce following the lifting of international sanctions. From the preceding observations, hypothesis two can be stated as follows:

**$H_0$  = The lifting of international sanctions has no significant impact on the book and market value leverage ratios of all sets of listed firms.**

**$H_a$  = The lifting of international sanctions has a significant impact on the book and market value of leverage ratios of all sets of listed firms**

#### **4.2.3 Hypothesis three**

Hypothesis three is formulated on the presupposition that the easing of exchange controls allows domestic firms to repatriate more funds abroad for investments and the purchase of foreign assets. As a result, domestic firms are expected to finance these repatriations from a variety of sources. However, given the fact that the series of exchange control relaxations occurred after 1995, a period in which the stock and banking sector was well developed, more financing options were available. It can be hypothesised that exchange control relaxations cause domestic firms to acquire external financing to finance repatriations. The source of the financing could principally be debt or equity. From the aforementioned arguments, it is hypothesised that:

**$H_0$  = Exchange control relaxations have no significant impact on the book and market values of leverage ratios of all sets of listed firms.**

**$H_a$  = Exchange control relaxations have a significant impact on the book and market value leverage ratios of all sets of listed firms.**

#### **4.2.4 Hypothesis four**

Domestic financial sector liberalisation takes on many forms, including the removal of controls on interest rates, direct lending provisions and the lowering of reserve requirements. In the case of reserve requirements, a series of steps were undertaken to lower reserve requirements in the 1990s (Nel, 2002: 70). Holding all other things constant, the lowering of reserve requirements could have provided financial institutions with more funds at their disposal. The possible effect would be an increase in domestic lending to the

private sector. As a result, the null ( $H_0$ ) and alternative hypotheses ( $H_a$ ) are stated as follows:

**$H_0 =$  Domestic financial sector liberalisation has no significant impact on the book and market value leverage ratios of all sets of listed firms.**

**$H_a =$  Domestic financial sector liberalisation has a significant impact on the book and market value leverage ratios of all sets of listed firms**

#### 4.2.5 Hypothesis five

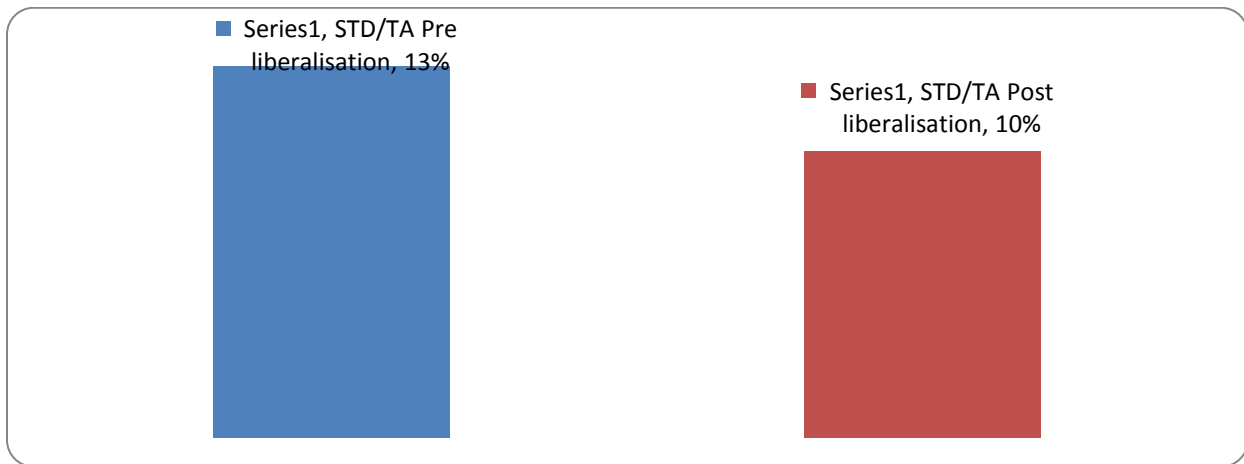
Hypothesis five is posited based on the effect of financial liberalisation on firm debt maturities. Smaller firms are more likely to have shorter debt maturities compared to larger firms. This, according to Gupta (1969: 526) is due to smaller firms' inability to access longer term finance. However, Demirguc-Kunt and Levine (1996: 224) argue that the stock market develops simultaneously with the domestic financial institutions. This increases competition in the financial markets thereby lowering the cost of debt. The lower cost of finance should increase smaller firms' access to debt with longer maturities. In contrast, Schmukler and Vesperoni (2006: 183) find that the average firm's debt maturity shifts from long term to short term debt. They observe that this shift is prominent in countries where the domestic financial system is less developed.

Although this finding suggests otherwise, the growth in financial institutions and the subsequent lower cost of funding in South Africa is a plausible assumption that the average firm should be less constrained. An examination of figures 4.1 and 4.2 reveals that there is a minimal reduction in the average short term debt ratio for both the smaller firms and the average South African listed firm. This provides us with an indication of a marginal shift to the access of longer term finance. On balance, two issues are emerging out of this preliminary assessment. Firstly, smaller firms are expected to access more long term debt. Secondly, the average firm's debt maturity structure shifts from short term to long term. Based on these observations, the null ( $H_0$ ) and alternative ( $H_a$ ) hypotheses can be stated as follows:

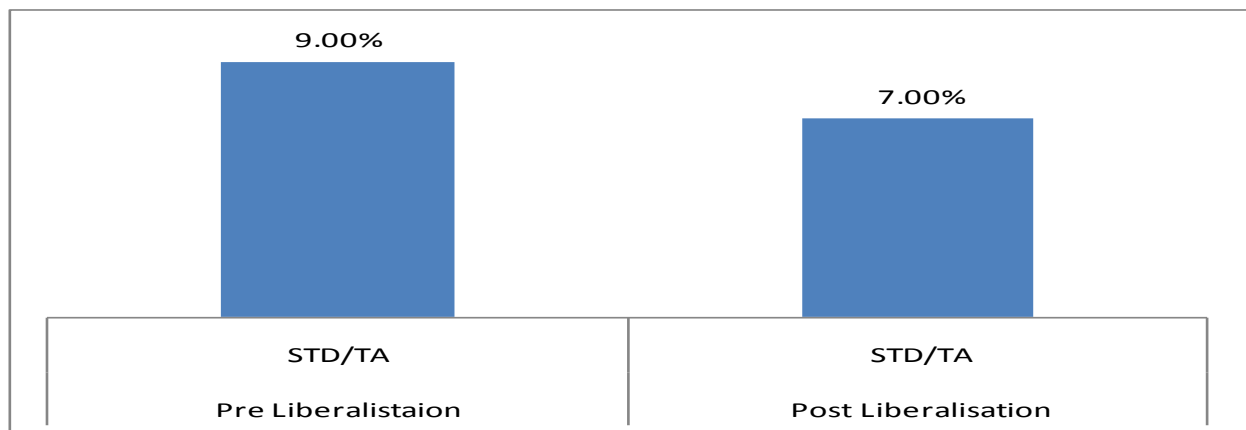
$H_0$  = *Financial liberalisation has no significant impact on the debt maturity structure of all sets of firms*

$H_a$  = *Financial liberalisation has a significant impact on the debt maturity structure of all sets of firms*

**Figure 4.1: The debt maturity structure for small firms**



**Figure 4.2: The debt maturity structure for the average firm**



#### 4.2.6 Hypothesis six

The sixth hypothesis relates to the importance of retained earnings. Despite the less developed nature of markets in the developing countries, empirical evidence suggests that firms in developing countries rely less on retained earnings and more on external finance

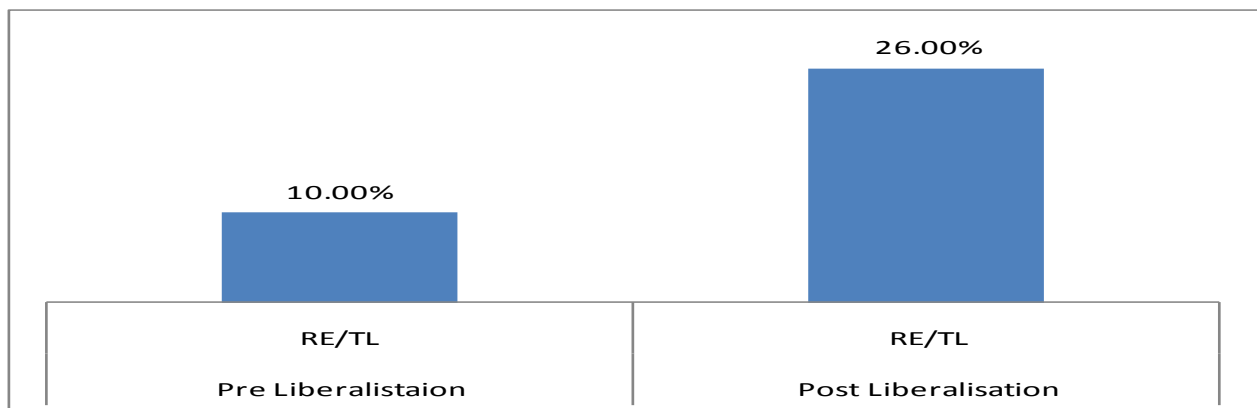
(See section 2.5.2). As the economy is liberalised, the domestic financial sector develops while improving the market infrastructure, thus creating more competition in the financial markets. This competition lowers the cost of external financing thereby improving the profitability of firms. This improved profitability may induce firms to retain more profits.

Furthermore, as the domestic financial market becomes more integrated with the international financial markets, firms in the domestic economy may begin to exhibit similar financing characteristics to their counterparts in the developed economies. The documented evidence regarding retentions is that firms in the developing economies rely more on retentions than firms in the less developed economies<sup>9</sup>. Figure 4.3 shows an increase in average retentions for South African firms after financial liberalisation, suggesting that firms in the post liberalisation regime may be associated with larger amounts of retentions. In this case, the null ( $H_o$ ) and alternative hypotheses ( $H_a$ ) can be stated as follows:

**$H_o$  = Financial liberalisation has no significant impact on the importance of internal financing for all sets of firms.**

**$H_a$  = Financial liberalisation has a significant impact on the importance of internal financing for all sets of firms.**

**Figure 4.3: Average retained earnings ratio for the pre and post liberalisation**



<sup>9</sup> See section 2.5.1 for a discussion on the differences between firms' use of internal finance in developing and developed countries.

#### 4.2.7 Hypothesis seven

The development of the stock and banking sector is the basis for raising hypothesis seven. The significance of the stock market and banking sector is an important feature in the choice of capital structure. Dermiguc-Kunt and Maksimovic (1996: 361) empirically test the effect of financial market development on firm financing choices, and they find banking sector development to be positively related to debt. The relationship is more significant for long term debt than for short term debt. The coefficient of stock market indicators is largely positive and significant for the developing countries. This relationship is prominent for large firms. This finding suggests that in economies where the stock market is developing, further development leads to more domestic borrowing. Based on these arguments the null ( $H_o$ ) and alternate hypotheses ( $H_a$ ) are stated as follows:

**$H_o$  = Stock and banking sector development has no significant impact on  
the book and market value leverage for all sets of firms.**

**$H_a$  = Stock and banking sector development has a significant positive impact on  
the book and market value leverage for all sets of firms**

#### 4.2.8 Hypothesis eight

The eighth hypothesis is formulated based on the stability of the parameters during the period of financial liberalisation. There are two principle dates where it is suspected that a structural shift in the coefficients is present. These dates include the years 1993 and 1995. Most of the economic sanctions were lifted by the end of 1992; hence 1993 is a suitable date to test for a shift in the regression parameters. The year 1995 is well recognised by the opening up of the JSE to foreign investment. Furthermore, it is envisaged that the capital account liberalisation and domestic financial sector liberalisation should have a significant impact on the regression coefficients. Based on these arguments the null ( $H_o$ ) and alternative hypotheses ( $H_a$ ) are stated as follows:



$H_0$  = *There is no structural shift in the regression coefficients during the period of financial reforms.*

$H_a$  = *There is a structural shift in the regression coefficients during the period of financial reforms.*

### 4.3 CHAPTER SUMMARY

This chapter has elaborated on the unresolved issues relating to the association between financial liberalisation and firm financing choices. In sum, there are eight hypotheses that need to be empirically tested. The first hypothesis is formulated based on the two opposing effects of stock market liberalisation. Firstly, the empirical evidence suggesting that stock market liberalisation lowers the cost of equity capital leads to the hypothesis that stock market liberalisation is negatively associated with leverage. Secondly, another set of circumstances based on the development of an active private and public debt market could sway the prediction in another direction, in that stock market liberalisation increases leverage ratios. In sum, the null and alternate hypotheses are formulated based on these arguments.

The second hypothesis has been developed based on the lifting of international sanctions. Prior empirical evidence suggests a lowering of the cost of equity capital for the period following the lifting of international sanctions on South Africa. Therefore, the lifting of the various economic sanctions could have lowered the leverage ratios for all sets of firms. The third hypothesis suggests that exchange control relaxations could have an impact on firm financing behaviour. The fourth hypothesis posits that domestic financial sector liberalisation could have a significant impact on the capital structure of firms.

The fifth hypothesis suggests that, following financial liberalisation, the debt maturity of both small and large listed firms could increase. The sixth hypothesis is formulated on the importance of retained earnings in financing investment. Following the observation that retained earnings increased after financial liberalisation, it is possible that there may be a significant increase in the use of retained earnings following financial liberalisation.

The seventh hypothesis emphasises on the association between the importance of the stock and the banking sector and firm leverage. Empirical evidence from emerging market studies suggests that there may be a positive association between leverage and the size of the bank sector.

The eighth hypothesis focuses on the equality of the slope parameters. The conjecture is that there may be a structural break in the parameter estimates for the firm specific determinants of capital structure. This structural shift in the parameter estimates is envisaged for 1993 (lifting of international sanctions), 1995 (stock market liberalisation), domestic financial sector liberalisation and capital account liberalisation.

The next two chapters prepare the ground for hypothesis testing. Chapter 5 resolves some of the outstanding methodological issues relating to this study and Chapter 6 develops the econometric models to be used to test the hypotheses.

## CHAPTER 5

### METHODOLOGICAL ISSUES

#### 5.1 INTRODUCTION

The previous chapter formulated hypotheses in relation to the research problem. These hypotheses need to be tested with an appropriate choice of methodology. There are several caveats that must be borne in mind, particularly with the dating of financial liberalisation and the use of the appropriate measures of leverage. These problems provide research design challenges, especially with the issue of gradual financial liberalisation. Before testing the hypotheses, it is necessary to provide a methodological background that clarifies these issues.

##### 5.1.1 Goal of this chapter

The goal of this chapter is five-fold; firstly, to identify the techniques used in the dating of financial liberalisation. Secondly, to recommend a suitable dating approach for financial liberalisation. Thirdly, to elaborate on the different measures of leverage used in the existing literature. Fourthly, to recommend the most appropriate measures of leverage for this study. Finally, to define the different variables to be used in the study.

##### 5.1.2 Layout of this chapter

The rest of this chapter is organised as follows; Section 5.2 focuses on the dating and identification of the appropriate dates of financial liberalisation in South Africa. Section 5.3 identifies the measures of leverage and recommends the suitable measures for this study. Section 5.4 defines the variables used in the analysis. Section 5.5 concludes the chapter.

## **5.2 THE DATING PROBLEM**

Chapter three of this study dealt briefly on the financial liberalisation dates used by different authors in various studies relating to financial liberalisation. This section addresses another aspect of the dating problem. This aspect emphasises on the challenges and techniques used in the dating of financial liberalisation.

### **5.2.1 Challenges in dating financial liberalisation**

The establishment of an appropriate date provides a benchmark to work with in determining the effects of financial liberalisation on the capital structure of firms. In establishing the appropriate date, it is important to note that there are two aspects associated with the dating of financial liberalisation. These are regulatory and effective liberalisation dates respectively. Regulatory liberalisation occurs as a result of a policy decree by government. On the other hand, effective liberalisation is the actual liberalisation which results in market integration.

The main challenge regarding this is that the actual date of financial liberalisation may occur well after the regulatory date. Conversely, the actual date may occur before the regulatory date. Makina and Negash (2005b: 62) caution that structural breaks in stock market data can occur before the official liberalisation. This is because investors can circumvent controls through country funds or depositary receipts. Structural breaks may also occur before the official liberalisation date due to anticipation by investors that restrictions would eventually be removed.

Another intriguing aspect to the dating problem relates to the gradual nature of financial liberalisation. Studies that utilise the event study method rely on a given benchmark date. This is specifically effective when the cut-off date is known. It may thus not be appropriate when the liberalisation occurs in a series of gradual events or reforms.

To complicate the problem further, the process of financial liberalisation is usually accompanied by a series of multifaceted reforms. In the case of corporate

announcements, information is guarded and little is known about the particular announcement, thus making it easier to date the event of financial liberalisation. It becomes difficult to guard against liberalisations effected by government as information about the event is anticipated. The event study approach may therefore have limited statistical power to detect the true impact of the financial liberalisation.

### **5.2.2 The techniques used to date financial liberalisation**

Henry (2000a: 533) lays out three specific guidelines that may be followed to establish the effective cut-off date. The first guideline is liberalisation by policy decree. The second guideline is the date of the establishment of the first country fund, and the third being an increase in the International Finance Corporation's (IFC) investability index by at least 10 percent. His study of twelve emerging economies utilises the policy decree approach, and in the absence of the first approach, the latter two alternatives are used.

Given the multifaceted nature of reforms, Bekaert, Harvey and Lundblad (2003: 55) acknowledge that the establishment of a cut-off date is purely a matter of judgement. The intuition behind this is that, firstly, the investment constraints that are prevalent in the pre-liberalisation regime may not be binding. Secondly, the implementation of regulatory changes is a gradual process. Thirdly, despite stock market integration, foreign investors are often subjected to liquidity costs associated with the shares in emerging markets.

Edison and Warnock (2003: 84) propose the use of the ratio of market capitalisation represented by the IFC Investable Indices to the market capitalisation represented by the IFC Global Indices. This ratio is argued to be more appropriate for emerging markets because it allows for the gradual integration and the inclusion of several liberalisation dates. Kaminsky and Schmukler (2008: 263) construct an index of financial liberalisation, which ranges from 1 (fully liberalised) to 3 (repression). They track this index over the period of financial reforms for a sample of emerging and mature markets.

### 5.2.3 The dating approach used in South African studies

When the actual liberalisation date is not well known, time series analysis techniques such as the ones utilised by Bai, Lumsdaine and Stock (1998: 395) could be used to determine whether there was a structural break in the stock market data. Bekaert *et al.* (2002a: 203) follow this approach in order to determine the breaks of several proxies to the dependent variable. They conclude that endogenous break dates occur later than exogenous break dates, thus ruling out the possibility of expectations. However, Makina (2005: 77) argues that this was not the case in South Africa, as there was a great deal of expectations regarding financial liberalisation. In South Africa, five possible structural breaks could have occurred when the following events took place;

- Political liberalisation in 1990,
- The lifting of economic sanctions in 1992,
- The ushering in of democracy in 1994,
- The abolishing of the dual exchange rate in 1995, and
- The gradual exchange control relaxations of the late 1990s to early 2000s.

Brooks, Davidson and Faff (1997: 259) examine the impact of South African economic developments on stock market volatility and they use February 2, 1990, the date when the ANC was unbanned, as a benchmark date for financial liberalisation. The authors find a greater integration with the international equity markets in the period after 1990. This can be attributed to the market's anticipation for the effective liberalisation of the JSE. The study by Bekaert, Harvey and Lundblad (2001: 469) uses 1992, when most economic sanctions were lifted. This date is justified because the authors examine real economic effects of financial liberalisation. Fuchs-Schundeln and Funke (2003: 757) test the financial and macroeconomic implications of stock market liberalisation for 27 countries and they use March 1995 for South Africa, the official liberalisation date of the JSE.

Makina and Negash (2005b: 61) test for structural breaks in the cost of capital variables around the two dates provided by Fuchs-Schundeln and Funke (2003: 730) and Brooks *et al.* (1997: 255). They include 1992 as the third date in their analysis. This date was

formally proposed by Bekaert *et al.* (2001: 465). This date was chosen because by the end of 1992, most economic sanctions on South Africa were lifted. To detect structural breaks around the three dates, they utilise the Chow test and the Broken Trend Stationary (BTS) test formalised by Perron (1989: 1361). They confirm significant structural breaks in stock market data for February 1990 and December 1992. Ironically, no structural break is detected for March 1995, the official liberalisation date of the JSE. Makina and Negash (2005b: 61) conclude that political and economic policy concerns were significant determinants of stock market liberalisation compared to direct legal barriers. This finding suggests that there was much anticipation for the full opening of the JSE, following major political developments in the early 1990s.

Once the structural breaks are identified, the period before the break can be analysed separately from the period after the break. Makina and Negash (2005a: 150) identify the pre liberalisation regime as the period before February 1990 and the post liberalisation regime as the period after December 1992. The period in between February 1990 and December 1992 is considered as the window period.

Loots (2003: 218) examines whether trade and financial liberalisation benefits economic growth in emerging economies, particularly in South Africa. The study incorporates progressive dummy variables that capture the six main dates when exchange controls in South Africa were relaxed. These dates range from March 1995, when the dual exchange rate system was re abolished, to March 2001 when the limit to new investment for residents was increased. This limit was increased to R750 million for investments into Africa and R500m for investments into the rest of the world.

#### **5.2.4 The dating approach followed in this study**

The insights discussed in the preceding section serve as eye openers in the quest to solve the dating puzzle. However, the dating issue is somewhat unresolved, principally because a static and segmented model forms the basis for some of the studies discussed. Nonetheless, the dynamic nature of integration has been captured by other studies

thereby rendering the focus on a single break date to be less reliable. Hence, this study focuses on capturing some of the gradual aspects of financial liberalisation in South Africa.

From the discussion in Sections 3.5 and 5.2.2, it appears that the actual dates of financial liberalisation in South Africa lie between 1989 and 1996. From this observation, it follows that the choice of date is dependent on the nature of the study. This study focuses on the removal of restrictions on more than one sector of the economy. Hence, it is necessary to include several financial liberalisation dates.

The regime dummy variable technique is used to determine structural breaks in the coefficients during the period of financial liberalisation. These techniques are applied for 1993 and 1995. It is assumed that the removal of sanctions by the end of 1992 could have initiated a structural break in regression parameters in the following year; hence, 1993 is chosen as a possible break date. The year 1995 is also chosen because of the opening up of the JSE to allow inward and outward investment.

Although Makina and Negash (2005b: 61) fail to detect a structural break in the cost of equity capital data, it is advisable to test for structural breaks for firm determinants of capital structure around this date. This is mainly because the political and economic events leading to the opening of the JSE in 1995 could have affected corporate financial policy.

The year 1993 is used as a possible date for the lifting of international sanctions. Dummy variables are used to capture the effects of the lifting of international sanctions on the capital structure variables. The value of one is used for the year 1993 going forward and zero otherwise. Domestic financial sector liberalisation is captured through the identification of post-apartheid deregulation of reserve requirements. It is not necessary to include the dates for the deregulation of interest rate and credit ceilings, because these reforms were mainly implemented prior to the 1985 debt standstill. This study examines the period after the 1985 debt standstill.



There are three notable dates associated with the decrease in reserve requirements. These are February 1991, when the basic requirement on short term liabilities was lowered from 5 percent to 4 percent. In April 1993, a subsequent decrease to 3 percent was effected and in April 1998 when the requirements were simplified to include a 2.5 percent rate on total liabilities<sup>10</sup>.

The date of stock market liberalisation is identified as 1995, the year the JSE was officially liberalised. To capture the effects of stock market liberalisation, a dummy that takes on the value of one is used for the period from 1995 going forward and zero otherwise. The years 1995, 1997 and 1998 are used to estimate the impact of capital account liberalisation on firm capital structure.<sup>11</sup> These dates represent the years when exchange controls were relaxed. Following Loots (2003: 218) a progressive dummy variable is created. This variable takes on the value of zero for the period before 1995, and increases by 0.5 for each subsequent exchange control relaxation.

The individual firm's access to international markets is also captured by the use of dummy variables. These variables take on the value of 1 for firms that have participated in international equity issues and zero otherwise. Therefore each firm that participated in international equity issues is considered in the regression model.

### **5.3 THE LEVERAGE MEASUREMENT PROBLEM**

The use of the appropriate measure of leverage has been a contentious issue. On this note, Green *et al.* (2003: 247) identify four key issues that have been the subject of debate. Firstly, whether to use aggregate sector accounts or individual firm balance sheet data. Secondly, whether to use firm balance sheet data or flow of funds data. Thirdly, whether to use book or market values of leverage ratios. Finally, if the flow of funds approach is used, the question is whether to use gross or net flows.

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<sup>10</sup> See Nel (2000: 71) for a detailed discussion on the minimum reserve requirements

<sup>11</sup> For a detailed discussion on these dates, see section 1.3.3

### 5.3.1 The objective of the analysis

Rajan and Zingales (1995: 1427) advise that the appropriate measure of leverage depends on the objective of the analysis. For example, if the objective is to study the maturity structure of debt, the ratio of short term debt to total debt may be more suitable. If the objective is to assess firms' reliance on internal funds, the appropriate measure would be the ratio of retained earnings to total liabilities.

Corbett and Jenkinson (1996: 76) argue that the flow of funds approach is more suitable than balance sheet data for international comparisons. The plausible explanation for this argument is that the flow of funds data addresses how financial markets have performed in funding investments. In light of this argument, Cobham and Subramaniam (1998: 1036) observe that international comparisons have utilised the flow of funds approach.

Because this study focuses on a single country (South Africa), the use of balance sheet data is adequate. Analysis of data at the firm level provides reliable insights, which may not be captured at the aggregate level. Schmukler and Vesperoni (2001: 4) contend that balance sheet data allow inter firm comparisons within the same macro economic framework. This micro analysis can help explain how individual firms' access to international equity markets affects their capital structure. Schmukler and Vesperoni (2006: 185) further advise that if markets are segmented, financial liberalisation may open opportunities only for some firms. The changes in capital structure for firms with and without access to international markets may not be captured effectively by a market level analysis.

The broadest measure of leverage is the ratio of total liabilities to total assets. Rajan and Zingales (1995: 1428) caution that this ratio may overstate leverage, simply because the amount for total liabilities includes accounts payables, which may be used for transactions rather than financing purposes. Again, the appropriate measures of leverage depend on the object of the study. In this study, several measures of leverage are studied, principally because the study explores the effect of financial liberalisation on capital structure in a broad sense. Following Bhaduri's (2002: 418) argument that different measures of

leverage may respond differently to the reform process, the behaviour of various combinations of leverage ratios should be examined. This argument is cemented by Bevan and Danbolt (2002: 159) who contend for a detailed examination of most forms of corporate debt.

### 5.3.2 Book versus market value ratios

Having established the appropriate measures of leverage, it is important to draw a distinction between the use of book and market values as reliable measures of leverage. Corporate finance literature advocates the use of market values in determining the capital structure of firms. The question is whether market values provide an accurate measure of the firm's financial position as compared to book values. The determination of market value ratios may require several calculations which in some instances may be onerous. Bowman (1980: 245) argues that many debt instruments are quoted at variable interest rates, subject to restrictions and conditions. One of the conditions is the requirement of compensating balances in a non interest bearing account. The possible solution would be to raise the effective interest rate above the stated rate. Such reinstatements can be onerous.

Another problem arises when the debt is convertible. The quoted price on the convertible debt may not be the market value of the debt. This is because the quoted price consists of the portion of the market price which is attributable to debt, and the portion attributed to equity. Weil, Segall and Green (1968: 445) and West and Largay (1972: 1156) attempt to address this problem by isolating the market value of the debt from the quoted price. Bowman (1980: 247) argues that this is not necessary because most convertible bonds have no ascertainable market value. Furthermore, if the market value could be determined, the difference would be marginal.

Prasad *et al.* (2001: 44) justify the use of book value measures because market values are subject to a number of "... factors orthogonal to the firm. Consequently, any changes in the leverage ratio when using the market values may not reflect any underlying alteration within the firm ..." Where market values are obtained, Bowman (1980: 242) demonstrates

that these two measures are highly correlated; hence the misspecification of using the book values is probably insignificant. An inspection of the correlations reported in Table 7.3, in Section 7.2, shows that the book and market values of leverage for South African data are highly correlated. For example, the correlation between the book and market value of the debt to equity ratio is 0.78 and the correlation between the book and market value measures of the total debt ratio is 0.79.

Marsh (1982: 131), Boyle and Eckhold (1997: 429) and Hovakimian, Opler and Titman (2001: 5) use both the book and market values of leverage ratios to model capital structure. Both methods yield similar results.

### **5.3.3 The measures used in this study**

Having the preceding caveats in mind, this study considers the effect of financial liberalisation on the book values of leverage ratios. However *quasi* market value measures of leverage are used for comparison purposes. In this case, book value measures are scaled by market values of equity. Table 5.1 provides a summary of how leverage ratios have been defined in some of the notable studies on capital structure.

**Table 5.1: Definitions of leverage**

Definition	Reference
<b>Total debt ratio</b>	
$\frac{\text{Shorttermdebt} + \text{Longtermdebt}(\text{Bookvalue})}{\text{Totalassets (Quasi market values)}}$	Rajan and Zingales (1995: 1427)
$\frac{\text{Totaldebt}(\text{Bookvalue})}{\text{Totalassets (Bookvalues)}}$	Wald (1999: 164)
$\frac{\text{Totalliabilities}(\text{Bookvalue})}{\text{Totalliabilities} + \text{networth}(\text{Quasimarket values})}$	Booth <i>et al.</i> (2001: 89)
$\frac{\text{Totaldebt}(\text{Bookvalue})}{\text{Totalassets (Bookvalue)}}$	Ozkan (2001: 185)
<b>Short term debt ratio</b>	
$\frac{\text{Shorttermdebt}(\text{Book Value})}{\text{Quasimarket value of equity}}$	Titman and Wessels (1988: 16)
$\frac{\text{Shorttermdebt}(\text{book value})}{\text{Book value of equity}}$	Schmukler and Vesperoni (2006: 189)
$\frac{\text{Shorttermdebt}(\text{Bookvalue})}{\text{Totalassets (Bookvalue)}}$	Gwatidzo and Ojah (2009: 5)
<b>Long term debt ratio</b>	
$\frac{\text{Longtermdebt}(\text{Book value})}{\text{Market value equity} + \text{Book value debt}}$	Bradley <i>et al.</i> (1984: 869)
$\frac{\text{Longtermdebt}(\text{Bookvalue})}{\text{Quasimarket value of equity}}$	Titman and Wessels (1988: 16)
$\frac{\text{Longtermdebt}(\text{Bookvalue})}{\text{Totalassets (Bookvalue)}}$	MacKie-Mason (1990: 1491)
$\frac{\text{Longtermdebt}(\text{Bookvalue})}{\text{Book value of equity}}$	Schmukler and Vesperoni (2006: 189)

## 5.4 VARIABLE DEFINITION

Despite the complex nature of financial liberalisation, the broad measurement of its impact on capital structure is fairly straight forward. This entails a regression of the debt ratio on a constant, a set of control variables and several macroeconomic and firm dummies. Hence, this section defines each of the aforementioned variables.

### 5.4.1 Dependent variables

- **Total debt to total assets (TD/TA)**

Since the objective of this research is exploratory, it is important to start with the broadest measure of leverage, which is the ratio of *total debt to total assets* calculated as book value of total interest bearing loans + redeemable preference shares (if applicable) + convertible loans (if applicable) divided by the book value of total assets. This ratio is also commonly referred to as the total debt ratio. An increase in the ratio may indicate higher risk, meaning that the firm may not be able to generate enough earnings to service the debt. The market value of the total debt ratio is calculated as total interest bearing debt divided by total assets – book value equity + market value equity.

- **Debt to equity (TD/E)**

The ratio of *debt to equity*, commonly referred to as the *debt-equity* ratio, measures the evolution of debt relative to equity. It is computed as the book value of total interest bearing debt divided by the book value of equity<sup>12</sup>. An increase in this ratio indicates that firms are relying more on interest bearing debt compared to equity.

- **Retained earnings to total liabilities (RE/TL)**

The ratio of *retained earnings to total liabilities* measures the importance of internally generated funds. It is defined as the ratio of retained earnings plus depreciation to the

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<sup>12</sup> The book value of equity is calculated as book equity + minority interests (if applicable). The market value of equity is calculated as the market capitalisation at print out date.

book value of total liabilities. An increase in this ratio indicates that firms are relying more on retained earnings to finance investment.

- **Short term debt to total debt (STD/TA)**

The ratio of *short term debt to total debt* measures the maturity structure of debt. It is calculated as book value of short term interest bearing loans divided by the book value of total assets. An increase in this ratio may indicate that firms' maturity structure of debt has decreased. In other words, firms are relying more on short term debt.

#### 5.4.2 Independent variables

The independent variables consist mainly of a series of macroeconomic and firm level control and dummy variables. The control variables identified are firm specific characteristics. The dummy variables are used to capture the lifting of international sanctions, stock market, financial sector and capital account liberalisation. An additional dummy variable is used to capture the effect of firms' access to international equity markets.

- **Control variables**

The challenge in the econometric approach is to be reasonably sure that the process of financial liberalisation is isolated from other confounding events. Bekeart and Harvey (2003: 5) acknowledge that existing economic models are not adequate to capture the whole process of liberalisation. Bearing this caveat in mind, the study considers firm level controls as confounding firm specific effects that need to be isolated.

Corporate finance literature advocates for several firm specific characteristics that may affect the choice of capital structure<sup>13</sup>. Rajan and Zingales (1995: 1451) argue that there are four main factors that have consistently shown to be correlated with leverage. These

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<sup>13</sup> These factors have been discussed in detail in section 2.4. See Gupta (1969: 526), Marsh (1982: 121), Rajan and Zingales (1995: 1422), Booth *et al.* (2001: ), Schmukler and Vesperoni (2006: 190), and Eriotis *et al.* (2007: 329)

are size, asset tangibility, profitability and growth prospects. This study therefore focuses only on these four factors to control for firm specific characteristics.

## **Size**

Corporate finance theory postulates that larger firms are in a better position to assume more debt compared to smaller firms<sup>14</sup>. Bearing this prediction in mind, it is expected that firm size will be positively related to leverage.

Empirical work on capital structure has utilised several reliable proxies for size. These are the natural logarithm of sales, net fixed assets, total assets and capital stock. Table 5.2 summarises the proxies used for size from selected influential studies on capital structure. Marsh (1982: 132) uses log of capital employed, but further experimented with log of total assets and equity market capitalisation. All these three approaches yielded similar results. Titman and Wessels (1988: 6) observe that the use of the natural logarithm of total assets and total sales do not affect the parameter estimates of their structural model.

A closer investigation of studies that focus on the impact of financial liberalisation on firm financing choices for other emerging markets (see Table 4.1) use capital stock, total assets and natural logarithm of net fixed assets. Given the preceding caveats, it appears that there is no reason to suspect that one proxy is more superior to the others. Hence, any of the proxies discussed can be used. This study uses the natural logarithm of total assets.

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<sup>14</sup> Refer to section 2.4 for a detailed discussion on the relationship between size and leverage



**Table 5.2: Summary of suitable proxies for size**

<b>Select studies on firm determinants of capital structure</b>	
<b>Reference</b>	<b>Proxy used</b>
Gupta (1961: 518)	Total assets
Marsh (1982: 132)	Log of capital employed <sup>15</sup>
Kester (1986: 22)	Volume of sales
Titman and Wessels (1988: 6)	Log of sales and quit rates <sup>16</sup>
Rajan and Zingales (1995: 1452)	Log of sales
Wald (1999: 173)	Log of total assets
Booth <i>et al.</i> (2001: 103)	Log of sales rescaled by multiplying by 100
Eriotis <i>et al.</i> (2007: 325)	Total sales
<b>Select studies on financial liberalisation and capital structure</b>	
<b>Reference</b>	<b>Proxy used</b>
Dermiguc-Kunt and Maksimovic (1996: 351)	Total assets
Galego and Loayza (200: 28)	Capital stock
Bhaduri (2000: 417)	Total assets
Schmukler and Vesperoni (2006: 190)	Log of net fixed assets

### ***Asset tangibility***

A reliable proxy for asset tangibility is the ratio of fixed assets to total assets. A high proportion of fixed assets in the firm's balance sheet can serve as collateral for lenders of finance. Moreover, in the event of bankruptcy, a higher proportion of tangible assets could enhance the salvage value of the firm's assets. Lenders of finance are thus willing to lend money to firms with a high proportion of tangible assets. It is expected that leverage will be positively correlated to asset tangibility.

<sup>15</sup> Marsh (1982: 132) performs back of the envelope experiments with log of total assets and equity market capitalisation and documents similar results.

<sup>16</sup> Titman and Wessels (1986: 6) find that parameter estimates are insensitive to the choice between the natural logarithm of total assets and sales.

## ***Profitability***

Profitability is defined as the ratio of net operating profit after taxes to total assets. Evidence regarding the relationship between profitability and leverage tends to support the theoretical predictions of Myers and Majluf (1984: 188)<sup>17</sup>. It is therefore expected that there will be a negative relationship between firm profitability and leverage.

## ***Growth prospects***

A reliable proxy for a firm's growth prospects is the ratio of market value of equity to the book value of equity. Barclay and Smith (1999: 14) posit that the stock price of a firm reflects the firm's present value of growth opportunities, whereas balance sheet values do not. It follows that the higher the market value relative to the book value of equity, the higher the growth prospects for the firm. Corporate finance theory predicts that high growth firms are exposed to potential costs of financial distress. This prohibits them from acquiring more debt in their capital structure. Conversely, firms with low growth prospects will be faced with a potential overinvestment problem, and are expected to have higher debt ratios<sup>18</sup>. Bearing this prediction in mind, it is expected that there is a negative relationship between growth prospects and leverage.

- **Dummy variables**

In order to determine the effects of financial liberalisation on the choice of capital structure, this study utilises four macroeconomic variables and two firm level dummies. The macroeconomic variables are lifting of international sanctions, stock market, domestic financial sector and capital account liberalisation. The firm level variables relate to internationally financed firms.

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<sup>17</sup> Kester (1986: 13) finds a negative relationship between profitability and leverage for the United States and Japan. Rajan and Zingales (1995: 1457) and Wald (1999: 169) draw similar conclusions for the United States, United Kingdom and Japan.

<sup>18</sup> For a detailed discussion on the empirical evidence of this relationship, see Barclay and Smith (1999: 13-14)

### ***Lifting of international sanctions (LIS)***

This variable captures the impact of the lifting of international sanctions on capital structure. The variable takes on the value of one for periods after the removal of most economic sanctions and zero otherwise.

### ***Stock market liberalisation (SML)***

This variable captures the impact of stock market liberalisation on capital structure. The variable takes on the value of one for periods after stock market liberalisation and zero otherwise.

### ***Domestic financial sector liberalisation (DFSL)***

This variable captures the impact of the removal of restrictions on the domestic financial sector. A progressive dummy is used that increases by 0.5 for each subsequent lowering of reserve requirements.

### ***Capital account liberalisation (CAL)***

This variable is related to the easing of exchange controls. The series of exchange control relaxations in South Africa provided opportunities for local firms to invest more funds abroad. This capital could have been raised from either internal sources or external security issues. Following Loots (2003: 237), the variable takes on the value of zero for the period between 1989 and 1994. The value increases by 0.5 for each subsequent exchange control relaxation date, starting from 1995, the date of the abolition of the financial Rand.

### ***Internationally financed firms (IFF)***

In order to capture the firm's access to international equity markets, the study incorporates a step dummy that takes the value of one from the time the firm issues equity in the

international equity markets and zero for periods prior to the date of the first issue<sup>19</sup>. Firm access to international markets can refer to a cross listing or issue of ADRs in the foreign market.

### ***Domestic financed firms (DFF)***

Another dummy variable that captures firms that have no access to international equity markets is included in the analysis. This variable takes on the value of one if the firm is domestically financed and zero otherwise.

### ***Financial market development***

Since financial liberalisation leads to the increased financial market activity, it is plausible to include in the analysis variables that capture the level of financial market development. Hence, two ratios are proposed; the ratio of stock market capitalisation to GDP (SMC/GDP) and the ratio of domestic credit to the private sector to GDP (DC/GDP). SMC/GDP measures the ability of the stock market to allocate capital for investment projects. DC/GDP measures the resources channelled to the private sector by domestic commercial banks.

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<sup>19</sup> A step dummy is appropriate for capturing international participation in equity markets because it is assumed that once a firm lists abroad, it will continue to raise equity finance for the foreseeable future.

Table 5.3 summarises the variables discussed and their expected signs.

**Table 5.3: Variables and expected signs**

Variable	Expected sign	Reference
Size	+	Rajan and Zingales (1995: 1453) Wald (1999: 169)
Tangibility	+	Friend and Lang (1988: ), Rajan and Zingales (1995: 1453)
Profitability	-	Rajan and Zingales (1995: 1453) Wald (1999: 169)
Growth	-	Rajan and Zingales (1995: 1453), Barclay and Smith (1999: 14)
Non-debt tax shields	+/-	Bradley, <i>et al</i> (1984: 873), Ozkan (2001: 187), Ngugi (2008: 620)
Tax	+	Mutenheri and Green (2003: 166)
Dividend payout	+/-	Boyle and Eckhold (1997: 434)
Stock Market Development	+	Demirguc-Kunt and Maksimovic (1996: 363)
Banking Sector Development	+	Galego and Loayza (2000: 34)
Internationally Financed Firms	-	Schmukler and Vesperoni (2006: 183) Flavin and O'connor (2010: 202)
Lifting of international sanctions	-	N/A
Stock Market Liberalisation	-	Schmukler and Vesperoni (2006: 183) Flavin and O'connor (2010: 202)
Capital Account Liberalisation	+	Schmukler and Vesperoni (2006: 183)
Domestic Financial Sector Liberalisation	+	Hübler, <i>et al.</i> (2008: 393)

## 5.5 CHAPTER SUMMARY

This chapter has addressed three main issues. Firstly, some caveats relating to the dating of financial liberalisation have been clarified. Secondly, the problems associated with the measurement of leverage have been resolved. Lastly, each variable used in the analysis has been defined.

The main challenge with dating financial liberalisation is the gradual and multifaceted nature of financial liberalisations. This chapter has carefully identified these issues and recommended on a suitable approach towards dating of financial liberalisation in relation to this study. The choice of the appropriate measure of leverage has been justified by the object of the study. Because this is an exploratory study, broad measures of leverage are included.

Book value balance sheet data have been argued for, because of three main reasons. Firstly, there are inherent problems in calculating market values of debt with special conditions. Following this, empirical evidence suggests the importance of market value measures over book values is insignificant. Secondly, firm level analysis provides reliable insights which may not be captured at the aggregate level. In this regard, micro analysis can help explain how individual firms' access to international equity markets can affect the choice of capital structure.

Finally, changes in the market value ratios are sensitive to various macroeconomic disturbances and hence may not reflect any underlying alteration within the firm. However, both measures of leverage have been recommended.

To capture the effect of financial liberalisation on capital structure, a set of variables were identified and classified under dependent and explanatory variables. The dependent variables include the various measures of leverage. The explanatory variables include a set of firm level controls, macroeconomic and firm level dummies and financial development indicators. The next chapter focuses on the research design and the appropriate econometric models.

## CHAPTER 6

### RESEARCH DESIGN AND ECONOMETRIC APPROACH

#### 6.1 INTRODUCTION

The preceding chapter recommended suitable approaches to resolving the dating and leverage measurement problem, and defined the variables to be used in the analysis. This provides a basis for choosing the appropriate research design. In this chapter, the research design is described based on the inputs from the preceding two chapters.

##### 6.1.1 Goal of this chapter

The primary goal of this chapter is to specify the overall research design by describing the data sources, sampling plan and the estimation techniques for testing the hypotheses. In establishing the appropriate techniques, the object is firstly, to develop suitable static and dynamic panel data models. Secondly, to devise an appropriate technique for testing the stability of the parameter estimates for the period of financial liberalisation.

##### 6.1.2 Layout of this chapter

The rest of the chapter is organised as follows: Section 6.2 describes the choice of firms and data. Section 6.3 outlines the data analysis plan and discusses the advantages and disadvantages of panel data techniques. Section 6.4 specifies the models to be estimated. Section 6.5 establishes the model to test for structural shifts in the parameter estimates. Section 6.6 identifies the formal tests of specification in panel data. Section 6.7 concludes the chapter.

## 6.2 CHOICE OF FIRMS AND DATA

The sample consists of JSE-listed non-financial firms that operated before and after the financial liberalisation phase. The I-Net Bridge<sup>20</sup> database is used to source audited income statements, balance sheets and financial ratios for a sample of firms that operated from 1989 to 2007. The stock market and banking sector development ratios are calculated from data obtained from the SARB. Information on the firm participation in international equity markets is obtained from the JSE and the Bank of New York Mellon Corporation website<sup>21</sup>.

The selected firms are the ones that did not change identity and main line of business. This will enable the facilitation of reliable inter temporal comparisons and also to minimise the effects of confounding factors such as mergers, acquisitions and restructurings. The firms should have reported consecutively on their financial position on an annual basis. Financial firms such as banks and insurance companies are excluded from the overall analysis<sup>22</sup> because their reporting of leverage is different from that of the non-financial firms.

To minimise confounding effects, all firms with market to book values exceeding 20 are removed from the analysis. Another possible confounding effect is the adoption of international financial reporting standards (IFRS). The treatment of certain accounting items may influence the behaviour of the financial ratios. This caveat is assumed to be a minor concern and therefore, not controlled for because the impact of financial liberalisation occurred mainly in the period before the effective dates of the implementation of IFRS. These dates are primarily from 2004 onwards. Firms with missing data points are excluded from the analysis.

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<sup>20</sup> Licensed to the University of the Witwatersrand. Financial ratios generated by I-Net Bridge are discussed in Section 5.4. Due to the subjective nature of financial ratios, It must be noted that the convention followed by I-Net Bridge may differ from other databases.

<sup>21</sup> [www.bnymellon.com](http://www.bnymellon.com).

<sup>22</sup> Most capital structure studies exclude financial firms due to the different financing behaviour of the firms in these industries. To allow for valid comparisons with other studies on emerging markets, this study excludes financial firms in the overall analysis.



Following Falkender and Peterson (2006: 52), ratios with a value greater than 1 are reset to 1. This exercise is carried out in order to prevent the means from being distorted by a few extremely high observations. The firms chosen are mainly from the six sectors of the JSE namely; Resources, Basic Industries, General Industrials, Cyclical Consumer Goods, Non-Cyclical Consumer Goods and Cyclical Services. The analysis is performed in two stages. The first stage utilises data set for the period 1989 to 1999. This is because the reforms that are being examined were implemented during this period. Furthermore, the specified period is used to include, in the analysis, as many firms as possible. Initially, the total number of firms that are continually listed for the years 1989 to 1999 is 120. The preceding criteria reduce the sample size to 100 firms with complete data for the period 1989 to 1999. This translates to a total of 1100 observations.

The sample is further split between small, large, internationally financed and domestically financed firms. Small firms have an average value of total assets below the median and large firms have an average total asset value higher than the median. The average value of total assets for each firm is calculated as the average of total assets for the years 1989 to 1994. Internationally financed firms are separated from domestically financed firms for purposes of calculating the average values of leverage for the two sets of firms. These average values are further calculated for the pre and post liberalisation periods. This exercise is performed to assess the contrasting effects of financial liberalisation on different sets of firms.

The second stage is performed to estimate the dynamics of firm leverage in the pre and post liberalisation regimes. This involves an extended data period ranging from 1989 to 2007. This reduces the sample size further to 70 firms, which translates to a total number of 280 observations for the pre liberalisation period and 688 observations for the post liberalisation period. Makina and Negash (2005a: 151) examine the effects of stock market liberalisation on the cost of equity capital for firms listed on the JSE, and they utilise a sample of 83 firms over a period of 10 years (1987 to 1997).

## 6.3 DATA ANALYSIS

### 6.3.1 Data analysis plan

The data on leverage ratios and explanatory variables are recorded in Microsoft Excel, and later exported onto the relevant statistical packages. In order to evaluate the accuracy of the data, a cross check is performed to ensure that all the figures are correct. All the relevant calculations are performed twice to ensure more accuracy. The structural break and pooled OLS estimations are carried out in E-Views version 7<sup>23</sup>. Stata version 11<sup>24</sup> is used to carry out the following panel data estimations; fixed (within) effects and random effects, instrumental variable, dynamic panel data estimations and tests of significance for panel data.

### 6.3.2 Panel data analysis

Various econometric procedures have been used to model capital structure behaviour. MacKie-Mason (1990: 1472) argues that incremental financing decisions can best be depicted by a probit model. However, panel data estimation techniques have been argued to be stronger due to their ability to combine the cross-sectional and time series nature of data<sup>25</sup>. This enhances the quality of the data being analysed.

Since panel data incorporates a cross-section of firms over a period of time, there is bound to be heterogeneity in the observed firms. Panel data techniques can take such heterogeneity into account by incorporating individual specific variables. This powerful combination provides less collinearity between variables and more degrees of freedom. The other advantage that is particularly suited to this study is that panel data analysis is well suited to detect the dynamics of change.

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<sup>23</sup> Licensed to the University of the Witwatersrand.

<sup>24</sup> Licensed to the University of the Witwatersrand

<sup>25</sup> See Ozkan (2001: 175), Ngugi (2008: 617) and Gwatidzo and Ojah (2009: 5) for arguments in favour of panel data.

Ozkan (2001: 176) advises that panel data techniques are more flexible in the choice of variables to control for endogeneity. This is a situation where unobservable factors affecting financing decisions may affect some of the firm specific characteristics such as the market value of equity. The three widely used applications of panel data are the pooled ordinary least squares (Pooled OLS), fixed and the random effects models<sup>26</sup>.

- **The pooled OLS model**

The pooled OLS model uses a constant intercept across all cross-sectional units. As a result, the slope and intercepts are assumed to be equal for all observations. Therefore, this model assumes that there is no observed heterogeneity among the units of analysis, and OLS can provide consistent and reliable estimates (Greene, 2003: 285).

- **The fixed effects model**

The fixed effects model assumes that differences in the cross-sectional units can be captured by differences in the constant term. Therefore, each cross-sectional unit has a fixed and unique intercept. Differences in the intercepts are the unobservable differences between the cross-sectional units which could be due to unique elements such as management style. Dummy variables are used to capture the unique unobservable elements of each firm; hence, this model is usually referred to as the Least Squares Dummy Variable (LSDV) Model.

Gujarati (2003: 646) highlights several drawbacks of the fixed effects panel data models. He cautions firstly, that the inclusion of too many cross-sectional units of observation necessitates the inclusion of several dummy variables. This has the potential to dilute the power of statistical tests by denying a certain degree of freedom to the analysis. Owing to the fact that 100 firms are examined in this study, the inclusion of dummy variables will be immense thereby eliminating the degrees of freedom that permit for powerful statistical

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<sup>26</sup> See Mutenheri and Green (2003: 166); Eriotis *et al.* (2007: 324) and Gwatidzo and Ojah (2009: 5) for a detailed discussion on these methods.

analysis. Secondly, the precise estimation of parameters may be difficult due to the possibility of multicollinearity. Finally, the fixed effects model assumes that the error term follows the classical assumptions.

To overcome the inherent weaknesses of the LSDV approach, two estimation techniques are used; the within estimator and the random effects model. The within estimator is used to transform variables by utilising group means to avoid dummies. As a result, this model provides more degrees of freedom as compared to the LSDV model.

- **The random effects model**

The random effects model can be used to address the assumption that the error term follows the classical assumptions. This approach expresses the lack of knowledge about the true model through the disturbance term. In this case, the intercept value represents the mean value of all cross-sectional intercepts, and the error component represents the random deviation of the individual intercept from the mean value. In other words, the selected firms in the analysis are a drawing from a larger universe of firms which have a common mean value for the intercept.

The individual differences in the firm intercepts are captured by the error term. Hence, the random effects model would be more appropriate for a random drawing from a larger sample<sup>27</sup>. The random effects model can be estimated by Generalised Least Squares (GLS) if the variance structure is known, and by Feasible Generalised Least Squares (GLS) if the variance structure is not known.

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<sup>27</sup> For a detailed discussion of the choice between the fixed effects and random effects model, see Gujarati, (2003: 650).

## 6.4 MODEL SPECIFICATION TECHNIQUES

This section specifies the equations to be used for the static and dynamic panel data models. The static panel data models include the fixed (within) and random effects estimation techniques. The dynamic panel data techniques include the Difference and System GMM models.

### 6.4.1 The static panel data model

The general static panel data model is specified as follows:

$$Lev_{i,t} = \alpha_i + \beta x'_{i,t} + u_{i,t} \tag{6.1}$$

$$\mu_{i,t} = \mu_i + v_{i,t}$$

Where:

$Lev_{i,t}$  = leverage ( $TD/TA(B)$ ,  $TD/TA(M)$ ,  $TD/E(M)$ ,  $TD/E(B)$ ,  $STD/TA$ ) for firm  $i$  at time  $t$

$x'_{i,t}$  = a vector of exogenous variables (Size, Growth, Tangibility, Taxes, Non-debt tax shields, Profitability and Dividend payout) for firm  $i$  at time  $t$

$\beta$  = A vector of slope parameters

$u_{i,t}$  = The composite error term

$\mu_i$  = The unobserved, time invariant firm specific effect.

$v_{i,t}$  = The stochastic term

The assumptions of this model are as follows:

- $Lev_{i,t}$ ,  $x'_{i,t}$  : ( $i = 1, \dots, N$ ;  $t = 1, \dots, T$ ) is a random sample where  $N$  is large and  $T$  is small.
- $x'_{i,t}$  is exogenous in relation to  $u_{i,t}$ , that is  $Cov(u_{i,t}, x'_{i,t}) = 0$
- The error term takes the following classical structure:  $E(u_{i,t} | x'_{i,t}) = 0$

#### 6.4.2 Estimation technique for testing the impact of financial liberalisation on capital structure.

To model the impact of financial liberalisation on capital structure, the static panel data model is used. The classical regression model follows, *inter alia*, the assumption of homoscedasticity. If this assumption is dropped and replaced with the assumption of heteroscedasticity, then the proposed model estimation may yield spurious correlations. Regressing leverage on the various independent variables would imply the assumption that there is inter-firm variability in leverage.

The plausible approach is to estimate the model in such a way that observations with greater variability in leverage are given less weight than those coming with smaller variability in leverage. Thus the usual Ordinary Least Squares (OLS) does not follow this convention as it assigns equal weight to each observation. The method of Generalised Least Squares (GLS) takes this inter-firm variability into account. Gujarati (2003: 397) adds: "... this is the right strategy, for in estimating the population regression function (PRF) more reliably we would like to give more weight to observations that are closely clustered around their (population) mean than those that are widely scattered about ...". Therefore, to model the effects of financial liberalisation on capital structure, the GLS estimation technique (with standard errors robust to heteroscedasticity) is used. The following general specification is estimated for each dependent variable:

$$\begin{aligned}
 Lev_{i,t} = & \alpha + \beta'X_{i,t} + \gamma IFF_{i,t} + \gamma DFF_{i,t} + \varphi(SMC/GDP)_t + \varphi(DC/GDP)_t + \theta LIS_t + \theta SML_t \\
 & + \theta DFSL_t + \theta CAL_t + \mu_{i,t}
 \end{aligned} \tag{6.2}$$

Where:  $i = 1, \dots, N$ , and

$$t = 1, \dots, T.$$

$X_{i,t}$  is a vector of firm specific controls. These controls are size, profitability, asset tangibility and growth opportunities. *IFF* is a dummy that takes the value of one if the firm

is internationally financed<sup>28</sup> and zero otherwise. *DFF* is a dummy that takes the value of one if the firm is domestically financed<sup>29</sup> and zero otherwise. *SMC/GDP* captures the effects of stock market development on leverage. *DC/GDP* captures the effects of the significance of the banking sector on leverage. *LIS*, *SML*, *DFSL* and *CAL* are time variant and firm invariant macroeconomic dummies capturing the lifting of international sanctions, stock market liberalisation, domestic financial sector liberalisation and capital account liberalisation respectively.  $\mu_{i,t}$  is the disturbance term. The assumption is that  $\mu_{i,t}$  is characterised by an independently distributed random variable with a mean value of zero and variance,  $\sigma_{i,t}^2$ .

Robustness checks are performed to control for potential endogeneity in the estimated relationship by using the instrumental variable technique suggested by Anderson and Hsiao (1982: 47). The instrumental variable technique will produce consistent estimates if the error term  $\mu_{i,t}$  is not serially correlated in levels.

#### 6.4.3 The dynamic panel data model

In order to estimate the dynamics of firm leverage effectively, it is important to take note that there is a possibility that the dependence of leverage on the explanatory variables is rarely instantaneous. In most cases, the dependent variable responds to the vector of explanatory variables with a lag. MacKie-Mason (1990: 1472) argues that a dynamic model is often ignored by many researchers when attempting to model the effects of capital structure determinants. From this argument, it follows that a lagged dependent variable should be included on the right hand side of the equation. The proposed model can be estimated using the following general specification:

$$Lev_{i,t} = \Phi[Lev_{i,t-1} + Size_{i,t} + Tang_{i,t} + Profit_{i,t} + Growth_{i,t} + Tax_{i,t} + Ndts_{i,t} + Div_{i,t} + u_{i,t}] \quad (6.3)$$

$$\mu_{i,t} = \alpha_i + v_t + \varepsilon_{i,t}$$

<sup>28</sup> A firm is internationally financed if it is cross-listed or has issued ADRs in the United States.

<sup>29</sup> A firm is domestically financed if it has not listed abroad via a cross listing or ADR issue.

Where:

$Lev_{i,t}$  = Leverage ratio of firm  $i$  in year  $t$  is calculated as the ratio of short term debt to total assets and the ratio of long term debt to total assets<sup>30</sup> and  $\Phi$  allows for lags in both the dependent and independent variables.

$Lev_{i,t-1}$  = The lagged dependent variable.

$Size_{i,t}$  = The size of firm  $i$  at time  $t$  and is measured by the log of total assets.

$Tang_{i,t}$  = The asset structure of firm  $i$  at time  $t$  and is calculated as the ratio of net fixed assets to total assets.

$Profit_{i,t}$  = The profitability of firm  $i$  at time  $t$ . It is calculated as the ratio of earnings before interest and taxes and depreciation (EBITDA) to total assets.

$Growth_{i,t}$  = The growth prospects of firm  $i$  at time  $t$ . It is computed as the ratio of the market value of equity to the book value of equity.

$Tax_{i,t}$  = The corporate tax rate of firm  $i$  at time  $t$ . It is computed as the ratio of tax paid to earnings before taxes.

$Ndts_{i,t}$  = Non-debt tax shields for firm  $i$  at time  $t$  and is computed as the ratio of depreciation to total assets.

$Div_{i,t}$  = The corporate dividend payout for firm  $i$  at time  $t$ . It is calculated as the ratio of ordinary dividend paid to earnings attributable to ordinary shareholders.

$\mu_{i,t}$  = The vector of unobserved disturbances, where  $\alpha_i$  is the unobservable firm specific effect that varies across firms but is fixed over time.  $\nu_t$  is the firm invariant time specific effect.  $\varepsilon_{i,t}$  is the white noise disturbance.

Firm adjustment to the targeted level of leverage is an important issue in modern day capital structure research (Huang & Ritter, 2009: 239). Given this observation, transaction costs and the associated speed of adjustment to the desired level of leverage needs to be established. The presence of transaction costs presents an impediment for firms to adjust automatically to their capital structure to the target level. Hence, the following partial adjustment model is specified:

<sup>30</sup> Alternative leverage ratios are used to estimate the determinants of capital structure. These ratios are defined in section 5.4



$$Lev_{i,t} - Lev_{i,t-1} = \delta(Lev_{i,t}^* - Lev_{i,t-1}), 0 < \delta \leq 1 \quad (6.4)$$

The parameter  $\delta$  is the speed of adjustment.  $Lev_{i,t} - Lev_{i,t-1}$  is the actual change in leverage and  $Lev_{i,t}^* - Lev_{i,t-1}$  is the desired change in leverage. If transaction costs are zero, then  $\delta = 1$ , meaning that firms will automatically adjust to their target capital structure. If transaction costs are 1, then  $\delta = 0$ , meaning that transaction costs are so high that  $Lev_{i,t} = Lev_{i,t-1}$ . From equation 6.4, the actual leverage level can be computed as:

$$Lev_{i,t} = \delta Lev_{i,t}^* + (1 - \delta) Lev_{i,t-1} \quad (6.5)$$

Substituting equation 6.5 into equation 6.1 gives the following specification:

$$Lev_{i,t} = (1 - \delta) Lev_{i,t-1} + \delta \alpha_i + \delta \beta X'_{i,t-1} + \mu_{i,t-1} \quad (6.6)$$

Where  $1 - \delta$  is a measure of the transaction costs, and  $X'_{i,t-1}$  is a vector of lagged firm specific determinants shown in equation 6.3. The presence of the lagged dependent variable on the right hand side of the equation provides a statistical bias where  $Lev_{i,t-1}$  will be correlated with the error term, even if  $v_{i,t}$  are not serially correlated. This renders OLS estimators to be inefficient. One way to resolve this problem is to first difference equation 6.6 in order to eliminate the firm specific effects:

$$Lev_{i,t} - Lev_{i,t-1} = \delta \beta_1 + (1 - \delta)(Lev_{i,t-1} - Lev_{i,t-2}) + \delta \beta (X'_{i,t-1} - X'_{i,t-2}) + \mu_{i,t-1} - \mu_{i,t-2} \quad (6.7)$$

Estimating equation 6.7 by using OLS may not consistently estimate the parameters because  $Lev_{i,t-1} - Lev_{i,t-2}$  and  $\mu_{i,t-1} - \mu_{i,t-2}$  are correlated through  $Lev_{i,t-1}$  and  $\mu_{i,t-1}$ . This problem can be resolved by utilising instrumental variables, on condition that the error term  $\mu_{i,t}$  is not serially correlated. Anderson and Hsiao (1982: 47) propose  $\Delta Lev_{i,t-2}$  or  $Lev_{i,t-2}$  as instruments for the first difference. The instrumental variable estimation technique may not be efficient due to lack of utilisation of all available moments. Arellano and Bond (1991: 279) resolve this by using the generalised method of moments (GMM) estimation technique. The GMM estimation utilises instruments that can be obtained from

the orthogonality conditions that exist between the lagged dependent variable and the error term.

Indeed, the GMM technique has proven to be a more superior method than other estimation techniques. However, Antoniou, Guney and Paudyal (2006: 176) and Antoniou *et al.* (2008: 70) argue that estimating equation 6.7 in its differenced form could lead to a problem of weak instruments. Specifically, first differencing causes loss of information. To minimise this loss of information, equation 6.6 is estimated simultaneously with equation 6.7 as a system. Hence, this approach is known as System GMM.

Following Arellano and Bover (1995: 29), instruments in differences are used for level equations and instruments in levels are used for equations in differences. This simultaneous approach to estimating the dynamic model of capital structure provides significant efficiency gains (Blundell & Bond, 1998: 115).

One important caveat should be mentioned about the System GMM estimator. Roodman (2009: 86) cautions that the coefficient of the lagged dependent variable could be sensitive to the choice of instruments. This could bias the true value of the coefficient estimate of the lagged dependent variable. The next section tests for the determinants of the adjustment speed to the target capital structure.

#### **6.4.4 Estimation technique for the determinants of the adjustment speed**

Following Drobetz and Wazenried (2006: 948), firms with high growth prospects may find it easier to alter the composition of new issues, even under asymmetric information. The intuition behind this argument is that, a growing firm's value may remain unchanged because of the positive effect of the future growth opportunities. Accordingly, growth firms should adjust to their target levels of leverage relatively fast.

Likewise, large firms should adjust rapidly to their target leverage. Because of sufficient analyst coverage and lower costs of information asymmetries, large firms should access debt and equity markets with relative ease. Moreover, the fixed costs associated with

capital structure changes should be smaller for large firms. On that account, size should be positively correlated to the adjustment speed.

It is expected that the speed of adjustment, denoted by  $\delta$ , is a linear function of a constant and a set of firm specific variables. These variables are denoted as  $\beta_1\gamma_{i,t}$ . The overall expression is shown as:

$$\delta = \beta_o + \beta_1\gamma_{i,t} \quad (6.8)$$

Substituting equation 6.8 into 6.6 gives the following specification:

$$Lev_{i,t} = (1 - \beta_o - \beta_1\gamma_{i,t})Lev_{i,t-1} + (\beta_o + \beta_1\gamma_{i,t})\beta X'_{i,t-1} + \mu_{i,t-1} \quad (6.9)$$

Equation 6.9 is multiplied out to obtain the following expression:

$$Lev_{i,t} = (1 - \beta_o)Lev_{i,t-1} - \beta_1\gamma_{i,t}Lev_{i,t-1} + \beta_o X'_{i,t-1} + \beta_1\gamma_{i,t}\beta X'_{i,t-1} + \mu_{i,t-1} \quad (7.0)$$

In equation 7, the lagged dependent variable is interacted with the firm specific determinants of capital structure. The coefficient of the interaction term,  $\beta_1$ , will provide an indication of the impact of the firm specific determinants on the adjustment speed.

## 6.5 TESTING FOR STRUCTURAL SHIFTS IN PARAMETER ESTIMATES

The economic reforms that were implemented in the early 1990s could have influenced the corporate financial policy of South African listed firms. This supposition can be validated by testing whether the parameter estimates for the estimated regression shifted at some point during the economic transition. The employment of one single regression for the entire period of 1989 to 2007 would imply that the relationship between leverage and firm specific determinants has not changed over time. This may not be plausible, owing to the fact that the opening of the economy to international investment could have initiated a structural shift in the determinants of corporate leverage.

### 6.5.1 Tests for the equality of intercepts and slopes

Where the break date is known *a priori*, the F test statistic developed by Chow (1960: 591) has been used extensively to test for structural stability of parameter estimates in OLS regressions. However, there are some qualifications with respect to the applicability of the Chow test. Firstly, the Chow test assumes that the error terms for the sub period regressions are normally distributed with the same homoscedastic variance. If the error terms are found to be heteroscedastic, then the Chow test may not be appropriate. Secondly, the Chow test will only report if two regressions are different and hence incapable of detecting which slope parameters are affected by the external shock. Given these caveats, the dummy variable estimation technique is used to test which coefficients are affected by financial liberalisation.

### 6.5.2 The dummy variable approach

The dummy variable technique addresses the inherent weakness of the Chow test by detecting the source of the difference in regression parameters over a period of time. To detect the source of the difference, a regime dummy variable is interacted with each explanatory variable as follows:

$$\text{Lev}_{i,t} = \alpha_i + \alpha_2 \text{DUM}_t + \beta_1 X'_{i,t}(\text{DUM}_t) + \mu_{i,t} \quad (7.1)$$

Where:

$\text{DUM}_t = 1$  for periods after the breakpoint and 0 otherwise.

$X'_{i,t}$  = The vector of explanatory variables to be interacted with the dummy variable.

$\mu_{i,t}$  = The composite error term

The interpretation of the output suggested by equation 7.1 is that, if the interaction between the dummy and the respective independent variable is statistically significant, then it can be concluded that there is a significant structural change in the coefficient of the interacted variable. This suggests that financial liberalisation has an influence on the respective determinants of corporate financial policy. In the next section, some formal specification tests for panel data are discussed.

## **6.6 FORMAL TESTS OF SPECIFICATION IN PANEL DATA**

This section accounts for some of the important tests to be carried out in this analysis. These tests include the Sargan test, test for lack of first and second order autocorrelation, Wald test for joint significance, multicollinearity tests and the Hausman (1978: 1251) specification test.

### **6.6.1 Sargan Test**

The Sargan test is a test of overidentifying restrictions. It is used to test for instrumental variable validity. The null hypothesis being tested is that the residuals are uncorrelated with the exogenous variables, under the assumption that these variables are truly exogenous. If the null hypothesis is accepted statistically, then the instruments are valid. In other words, a higher p-value indicates better instrument validity.

### **6.6.2 Test for lack of first and second order autocorrelation**

To test for lack of first and second order correlation and the Arellano and Bond (1991: 279) test for zero autocorrelation in the residuals are used. If the null hypothesis of zero autocorrelation is not rejected in favour of the alternative hypothesis, then there is no autocorrelation in the residuals.

### **6.6.3 Wald Test: Joint Significance**

The Wald test for joint significance has been widely used to test for the significance of independent variables in a regression. The null hypothesis is that all coefficients of the regressors are equal to zero. Conversely, the alternative hypothesis is that the coefficients are not equal to zero. If the Wald test is significant, then the interpretation would mean that the variables should be included in the model. If, on the other hand, the test is insignificant, then variables need to be omitted.

#### **6.6.4 Multicollinearity tests**

A common problem in multiple regressions arises when the explanatory variables in the regression equation are highly correlated with each other. If there is indeed a problem of severe multicollinearity, one may find spurious correlations. The use of a correlation matrix will determine which variables exhibit multicollinearity.

Another test that is widely used for multicollinearity is the variance inflation factor (VIF) for multicollinearity or the formal detection tolerance. This measures the increase in the variance of each coefficient when collinearity is present. VIF is the inverse of tolerance such that  $VIF = \frac{1}{TOL}$ . A tolerance of less than 0.10 or a VIF of 10 and above may indicate a multicollinearity problem (Menard, 1995: 66).

#### **6.6.5 Hausman specification test**

The choice between the fixed (within) and random effects models is dependent on a formal test of significance formalised by Hausman (1978: 1251). The null hypothesis of this test is that the residuals in the random effects model are uncorrelated with the regressors. Therefore, if the null hypothesis is true, then the random effects model is suitable. If the null hypothesis is rejected, then the fixed (within) effects model may be more suitable than the random effects model.

### **6.7 CHAPTER SUMMARY**

This chapter has focused on the choice of data and empirical models to be used to test the hypothesis formulated in chapter 4. Panel data estimation techniques have been argued for due to their ability to combine a broad cross-section of firms over a short time period. The appropriate choice of an estimation model has been justified in relation to previous empirical work and the nature of this study.

The regime dummy variable technique has been proposed to test for structural breaks in the equation parameters. This method has been argued to be more effective than the Chow break point test, owing to its ability to detect the source of the structural breaks in the equation parameters.

To test the determinants of capital structure for the period before and after financial liberalisation, stronger econometric tests have been argued for based on the dynamic nature of the panel data. This procedure allows for lags in the dependent and independent variables, thereby providing a better framework for understanding the effects of firm specific characteristics on capital structure. The GMM technique has been recommended based on its ability to take into account the orthogonality conditions between the lagged dependent variable and the error term.

To test the impact of financial liberalisation on capital structure, the fixed (within) effects, random effects and pooled effects models are used. These models are adequate to capture the effects of a battery of events that occurred in the financial liberalisation phase of the 1990s. Formal tests of significance in panel data have been proposed: The Sargan test, tests for lack of first and second order autocorrelation, the Wald (Joint significance) test, Hausman specification test and multicollinearity tests. In the next chapter, the econometric procedures discussed in this chapter are applied and the results are discussed based on the conjectures formulated in Chapter 4.

## CHAPTER 7

### EMPIRICAL RESULTS

#### 7.1. INTRODUCTION

The preceding chapter developed the econometric approaches to resolving the identified research problem. This chapter reports the results generated by the estimated models. These models are carefully applied in order to generate meaningful and presentable results.

##### 7.1.1 Goal of this chapter

The main goal of this chapter is to report and discuss the results of the study in line with the objectives of the study.

##### 7.1.2 Layout of this chapter

The rest of the chapter is structured as follows: Section 7.2 performs basic statistical tests on the data and reports the summary statistics. Section 7.3 compares and contrasts the average values of leverage for different sets of firms across the pre and post liberalisation regime. Section 7.4 reports the regression outputs. Section 7.5 discusses the static panel data results. Section 7.6 discusses the firm specific determinants of capital structure and Section 7.7 documents the results of the long run target adjustment model and transaction costs. Section 7.8 summarises the chapter.

#### 7.2 BASIC TESTS AND SUMMARY STATISTICS

##### 7.2.1 Normality tests

Table 7.1 reports the summary statistics for all the variables used in the study. The tests of data integrity show that most variables are evenly distributed with skewness coefficients close to zero. The only exceptions are the internal finance (RE/TL) and growth variables with skewness coefficients of 3.76 and 1.33 respectively. The kurtosis coefficients for most



variables have values less than three, indicative of no positive excess kurtosis. The only exception is the internal finance variable which has a kurtosis coefficient of 15.45. Therefore, based on the statistics, the null hypothesis of normality cannot be rejected for all variables except for internal finance<sup>31</sup>.

**Table 7.1: Summary statistics for all the dependent and independent variables**

Variable	Mean	Median	Standard deviation	Min	Max	Skewness	Kurtosis
TD/E(B)	0.36924	0.37054	0.06731	0.000	1.000	0.09264	-0.4558
TD/E(M)	0.46126	0.46986	0.18651	0.000	1.000	0.25271	-1.0613
TD/TA(B)	0.15530	0.15599	0.01540	0.000	1.000	-0.17733	-0.0937
TD/TA(M)	0.14983	0.14949	0.02784	0.000	1.000	0.524	0.4419
RE/TL	0.21083	0.10861	0.41053	-0.1486	1.83370	3.76785	15.4539
STD/TA	0.07643	0.07691	0.00986	-0.54561	1.000	-0.60189	-0.4920
Size	5.90111	5.96215	0.27728	5.42848	6.35701	-0.17342	-1.1938
Tangibility	0.31744	0.31471	0.008123	0.30489	0.33501	0.578352	-0.4833
Profitability	0.14902	0.14681	0.025435	0.10277	0.19147	-0.02338	-0.5191
Growth	1.864833	1.678534	0.4755	1.317076	2.876098	1.33743	0.793151
Tax	0.24617	0.24457	0.069013	0.04981	0.38146	-0.82452	3.02459
Ndts	0.03569	0.03616	0.002828	0.03090	0.04249	0.496659	0.31324
Dividend	0.34911	0.33107	0.096705	0.17840	0.59054	0.801018	1.02567

Notes: TD/E (B) is the book value of the ratio of total serviced debt to equity. TD/E (M) is the market value of the ratio of total serviced debt to equity. TD/TA (B) is the book value of the ratio of total serviced debt to total assets. TD/TA (M) is calculated as (Total interest bearing debt/ (Total assets – Book equity + market equity)). RE/TL is the book value of the ratio of retained earnings plus depreciation to total liabilities. STD/TA is the book value of the ratio of short term interest bearing debt to total assets. Size is calculated as the natural logarithm of total assets. Tangibility is calculated as the ratio of fixed assets to total assets. Profitability is calculated as the ratio of earnings attributable to ordinary shareholders to total assets. Growth is calculated as the ratio of market value of equity to the book value of equity. Tax is calculated as the ratio of taxes paid to earnings before tax. Ndts is calculated as the ratio of depreciation to total assets. Dividend is calculated as the ratio of ordinary dividends paid to earnings attributable to ordinary shareholders.

## 7.2.2 Average values for leverage

Table 7.2 reports the average cross-sectional values of both the dependent and independent variables for each year. The book and market values of the total debt ratio have been fairly steady over the sample period. However, a general decline in the book and market values of the debt to equity ratio is evident for the period between 1989 and 1999. The average book value of the debt to equity ratio starts to increase after the year 2000. This general increase may be attributed to the decline in the market interest rates

<sup>31</sup> The internal finance variable is later dropped from the regression analyses because of its lack of significance with the regressors.

for the same period and the growth in the economy following the September 11, 2001 crisis. The average market value of the debt to equity ratio declined steadily up to 1999, and peaked in the years 2000 and 2001. For example, the market value of the debt to equity ratio declined from 60.49 percent in 1989 to 49.44 percent in the year 1999. The general decline in the average market value of the debt to equity ratio resumes in the year 2002, and continues to 2007.

**Table 7.2: Average values for variables over the sample period**

	<b>TD/E(B)</b>	<b>TD/E(M)</b>	<b>TD/TA(B)</b>	<b>TD/TA(M)</b>	<b>RE/TL</b>	<b>STD/TA</b>	<b>Size</b>	<b>Tang</b>	<b>Profit</b>	<b>Growth</b>	<b>Tax</b>	<b>Ndts</b>	<b>Div</b>
<b>1989</b>	0.3364	0.6049	0.1475	0.1376	0.1554	0.0746	5.4285	0.3049	0.1903	1.573785	0.3262	0.0309	0.3267
<b>1990</b>	0.3926	0.6172	0.1541	0.1651	0.0722	0.0876	5.5064	0.3100	0.1915	1.606582	0.2929	0.0335	0.3630
<b>1991</b>	0.3914	0.5873	0.1583	0.1685	0.1128	0.0838	5.5700	0.3097	0.1779	1.924902	0.3815	0.0347	0.4564
<b>1992</b>	0.3414	0.5885	0.1487	0.1549	0.0981	0.0845	5.6016	0.3121	0.1425	1.317076	0.2469	0.0363	0.4474
<b>1993</b>	0.3876	0.6530	0.1522	0.1540	0.1086	0.0817	5.6231	0.3177	0.1410	1.537299	0.1955	0.0338	0.3704
<b>1994</b>	0.2532	0.4699	0.1493	0.1437	0.0755	0.0871	5.6643	0.3138	0.1028	1.858157	0.2446	0.0331	0.3707
<b>1995</b>	0.3529	0.2361	0.1417	0.1065	0.0969	0.0633	5.7367	0.3096	0.1442	1.927663	0.2157	0.0333	0.2956
<b>1996</b>	0.2908	0.2184	0.1275	0.1069	0.2258	0.0597	5.8206	0.3177	0.1391	1.990512	0.2300	0.0362	0.3165
<b>1997</b>	0.2652	0.2394	0.1266	0.1413	0.1744	0.0667	5.8969	0.3269	0.1239	1.788195	0.2129	0.0345	0.1784
<b>1998</b>	0.2973	0.3855	0.1370	0.1495	0.2151	0.0561	5.9622	0.3299	0.1065	1.477086	0.2256	0.0362	0.5905
<b>1999</b>	0.4518	0.4944	0.1677	0.1831	0.4242	0.0843	6.0172	0.3350	0.1468	1.648197	0.0498	0.0366	0.2565
<b>2000</b>	0.5039	0.7389	0.1803	0.1891	1.8337	0.0839	6.0377	0.3243	0.1342	1.529298	0.1931	0.0378	0.2730
<b>2001</b>	0.4501	0.8234	0.1835	0.2158	0.0791	0.0906	6.0807	0.3245	0.1230	1.474732	0.1986	0.0377	0.2617
<b>2002</b>	0.4433	0.5520	0.1668	0.1649	-0.1487	0.0769	6.1071	0.3129	0.1525	1.678534	0.2670	0.0383	0.3644
<b>2003</b>	0.3705	0.4106	0.1624	0.1551	-0.0690	0.0789	6.1201	0.3147	0.1472	1.528826	0.3225	0.0387	0.3046
<b>2004</b>	0.3310	0.3457	0.1560	0.1346	0.0871	0.0714	6.1367	0.3227	0.1527	2.062700	0.2729	0.0425	0.3311
<b>2005</b>	0.3431	0.2787	0.1595	0.1271	0.0924	0.0695	6.1827	0.3227	0.1727	2.832847	0.2354	0.0385	0.4966
<b>2006</b>	0.3896	0.2630	0.1659	0.1303	0.2602	0.0756	6.2717	0.3104	0.1680	2.876098	0.2899	0.0336	0.2623
<b>2007</b>	0.4234	0.2573	0.1656	0.1189	0.1119	0.0760	6.3570	0.3119	0.1745	2.799341	0.2765	0.0320	0.3674

Notes: TD/E (B) is the book value of the ratio of total serviced debt to equity. TD/E (M) is the market value of the ratio of total serviced debt to equity. TD/TA (B) is the book value of the ratio of total serviced debt to total assets. TD/TA (M) is calculated as (Total interest bearing debt/ (Total assets – Book equity + market equity). RE/TL is the book value of the ratio of retained earnings plus depreciation to total liabilities. STD/TA is the book value of the ratio of short term interest bearing debt to total assets. Size is calculated as the natural logarithm of total assets. Tang is calculated as the ratio of fixed assets to total assets. Profit is calculated as the ratio of earnings attributable to ordinary shareholders to total assets. Growth is calculated as the ratio of market value of equity to the book value of equity. Tax is calculated as the ratio of taxes paid to earnings before tax. Ndts is calculated as the ratio of depreciation to total assets. Div is calculated as the ratio of ordinary dividends paid to earnings attributable to ordinary shareholders.

### **7.2.3 Correlation matrices and variance inflation factors**

Table 7.3 is a correlation matrix for all the independent variables used. The non-debt tax shields and tangibility variables have the highest correlation coefficient of 44.18 percent. This is followed by profitability and growth, which have a correlation coefficient of 40.99 percent. The majority of the correlation coefficients are fairly small, suggesting that multicollinearity is not a problem. Table 7.4 reports the variance inflation factor for the relationship between the independent and dependent variables. All the associated values are less than 10, again indicating that multicollinearity may not be a concern.

**Table 7.3: Correlation matrix for the independent variables**

	Growth	Tang	Ndts	Profit	Size	Tax	Div
Growth	1.0000						
Tang	-0.0202 (0.4623)	1.0000					
Ndts	0.0666** (0.0152)	0.442*** (0.0000)	1.0000				
Profit	0.409*** (0.0000)	-0.114*** (0.0000)	0.0692** (0.0116)	1.0000			
Size	0.324*** (0.0000)	0.230*** (0.0000)	0.1132*** (0.0000)	0.0432 (0.1152)	1.0000		
Tax	0.221*** (0.0000)	-0.0277 (0.3126)	0.0623** (0.0230)	0.402*** (0.0000)	0.073*** (0.0080)	1.0000	
Div	0.226*** (0.0000)	0.177*** (0.0000)	0.095*** (0.0005)	0.147*** (0.0000)	0.282*** (0.0000)	0.338*** (0.0000)	1.0000

Notes: \*, \*\*, \*\*\* indicate significance levels at 10, 5 and 1 respectively. p-values are in parentheses.

**Table 7.4: Variance inflation factors and Tolerance for the dependent variables**

Variable	TD/E(B)		TD/E(M)		TD/TA(B)		TD/TA(M)	
	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
Size	1.23	0.811338	1.23	0.811338	1.23	0.811338	1.23	0.811338
Tang	1.17	0.854769	1.17	0.854769	1.17	0.854769	1.17	0.854769
Growth	1.15	0.869056	1.15	0.869056	1.15	0.869056	1.15	0.869056
Profit	1.11	0.902985	1.11	0.902985	1.11	0.902985	1.11	0.902985
Ndts	1.09	0.917127	1.09	0.917127	1.09	0.917127	1.09	0.917127
Tax	1.02	0.982193	1.02	0.982193	1.02	0.982193	1.02	0.982193
Div	1.02	0.984763	1.02	0.984763	1.02	0.984763	1.02	0.984763
Mean VIF	<b>1.11</b>		<b>1.11</b>		<b>1.11</b>		<b>1.11</b>	

Table 7.5 provides a detailed correlation matrix for all the variables. Most of the correlations presented in this table are confirming the predictions of some of the capital structure theories. Growth is negatively correlated to leverage, a confirmation of the contracting cost theory. This relationship is statistically significant for the market value debt ratios. The tangibility variable is positive and significant at the 1 percent level of significance for all the dependent variables. This shows that asset structure is an important criterion for assessing the firm's ability to access loans. The non-debt tax shield variable is positive and significant at the 1 percent level for all the dependent variables. The correlation coefficient for the non-debt tax shield and tangibility variables is positive and significant, signifying that firms with high non-debt tax shields have a high proportion of fixed assets. This may provide an incentive for firms to accumulate more debt.

The profitability variable is negatively related to leverage. This negative relationship confirms the pecking order hypothesis. The size variable is positively correlated to the book value measures of leverage, indicating that larger firms have more debt in their capital structure. However, a negative association is observed between size and the market values of leverage, suggesting low information asymmetries associated with large firms. Taxes and dividend payout are both negatively related to leverage. The correlations are significant at the 1 percent level.

**Table 7.5: Correlation matrix for all variables**

	TD/E(B)	TD/E(M)	TD/TA(B)	TD/TA(M)	STD/TA	RE/TL	Growth	Tang	Ndts	Profit	Size	Tax	Div
TD/E(B)	1.000												
TD/E(M)	0.781***	1.000											
TD/TA(B)	0.898***	0.768***	1.000										
TD/TA(M)	0.711***	0.826***	0.786***	1.000									
STD/TA	0.657***	0.589***	0.715***	0.659***	1.000								
RE/TL	-0.232***	-0.286***	-0.198***	-0.335***	-0.219***	1.000							
Growth	0.008	-0.473***	-0.012	-0.362***	-0.017	0.235***	1.000						
Tang	0.135***	0.115***	0.188***	0.202***	0.008	0.035	-0.020	1.000					
Ndts	0.113***	0.111***	0.119***	0.124***	0.062**	0.156***	0.066**	0.441***	1.000				
Profit	-0.229***	-0.381***	-0.215***	-0.323***	-0.175***	0.473***	0.409***	-0.114***	0.069**	1.000			
Size	0.024	-0.130***	0.052*	-0.071***	-0.051*	0.050*	0.324***	0.230***	0.113***	0.043	1.000		
Tax	-0.181***	-0.268***	-0.210***	-0.295**	-0.185***	0.162***	0.220***	-0.028	0.062**	0.402***	0.073***	1.000	
Div	-0.132***	-0.244***	-0.139***	-0.166***	-0.112*	-0.044	0.225***	0.177***	0.095***	0.147***	0.282***	0.338***	1.00

Notes: \*, \*\*, \*\*\* indicate significance levels at 10%, 5% and 1% respectively. The variables are as defined in Table 7.2.

#### **7.2.4 Outlier diagnostics**

Outliers in the data could distort the predictive power of the regression models used. There are basically four methods that have been used to identify influential points in the data. These statistics include Studentised Residuals, Leverage, Cook's D and DFITS. These methods assess the overall impact of observations on regression results. Studentised Residuals are a basic means of identifying potential outliers in the data. An observation which has a Studentised Residual value that exceeds +2 or -2 is deleted from the analysis. Leverage measures the deviation of an independent variable from its mean. An observation that has Leverage value greater than  $2k+2/n$ , which is 0.021818, is examined with caution. K is the number of regressors and n is the number of observations.

Cook's D and DFITS combine the information on Studentised residuals and leverage. Zero is the lowest value for Cook's D. Therefore, the higher the value the more influential the observation is. Any observation above the cut-off point derived from the expression  $4/n$ , which is 0.00364, is noted and deleted. The cut-off point for DFITS is measured by the expression  $[2 \times \text{square root } (k/n)]$ , which equals 0.2 for this analysis. K is the number of regressors and n is the number of observations. The values for DFITS can either be negative or positive. A value close to zero is the least influential point. The total number of outliers identified by this exercise totalled 71, therefore, reducing the number of observations from 1100 to 1029.

### **7.3 THE CONTRASTING EFFECTS OF FINANCIAL LIBERALISATION ON CAPITAL STRUCTURE**

This section presents a set of figures aimed at highlighting the contrasting effects of financial liberalisation on three different sets of firms. These include the full set of all sampled firms, firms that actively participate in international equity markets and firms that have not accessed international equity markets. Two additional size adjusted sets of firms are included in the analysis. Firms with access to international equity markets

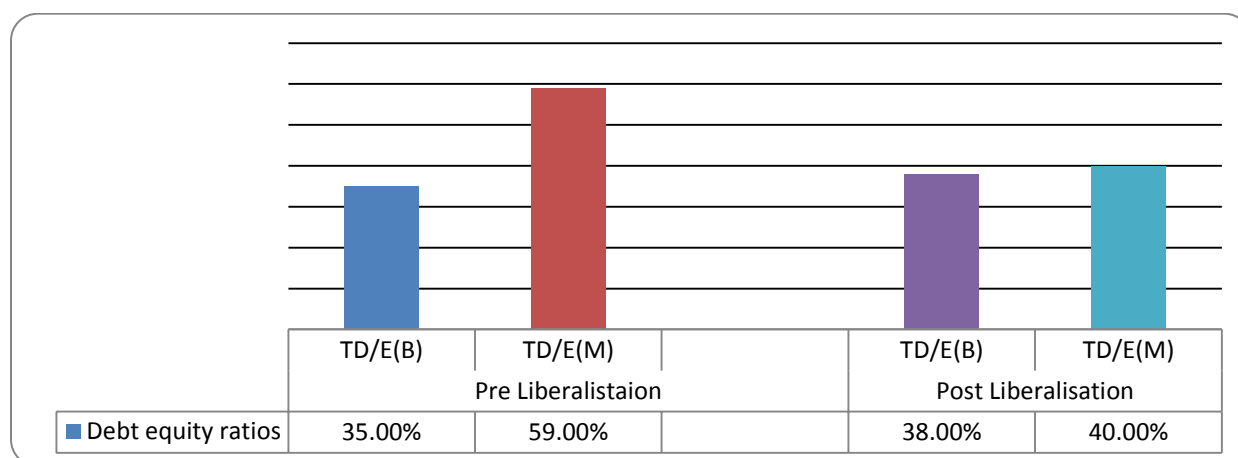


are those that are either ADR issuers<sup>32</sup> or firms that are cross-listed. Small firms are the ones with the average value of total assets less than the median value of total assets. Likewise, large firms have average total asset values higher than the median value of assets. The average value of assets is calculated for the period between 1989 and 1994.

### 7.3.1 Average leverage ratios for all firms (pre and post liberalisation)

Figure 7.1 reveals the contrasting effects of financial liberalisation on the book and market values of the debt to equity ratio for the full sample set. This preliminary analysis suggests that financial liberalisation may have a significant effect on the market value of the debt to equity ratio. The average market value of the debt to equity ratio declines by 19 percent. Schmukler and Vesperoni (2006: 188) report a similar reduction but for the book value ratio for a sample of firms in emerging market economies. This observation suggests that the opening up of the JSE, and further participation of local firms in the international equity markets increases the average market value of equity relative to debt. There is, however, a marginal increase in the average book value of the debt to equity ratio.

**Figure 7.1: Book and market value debt ratios for all firms (pre and post liberalisation)**

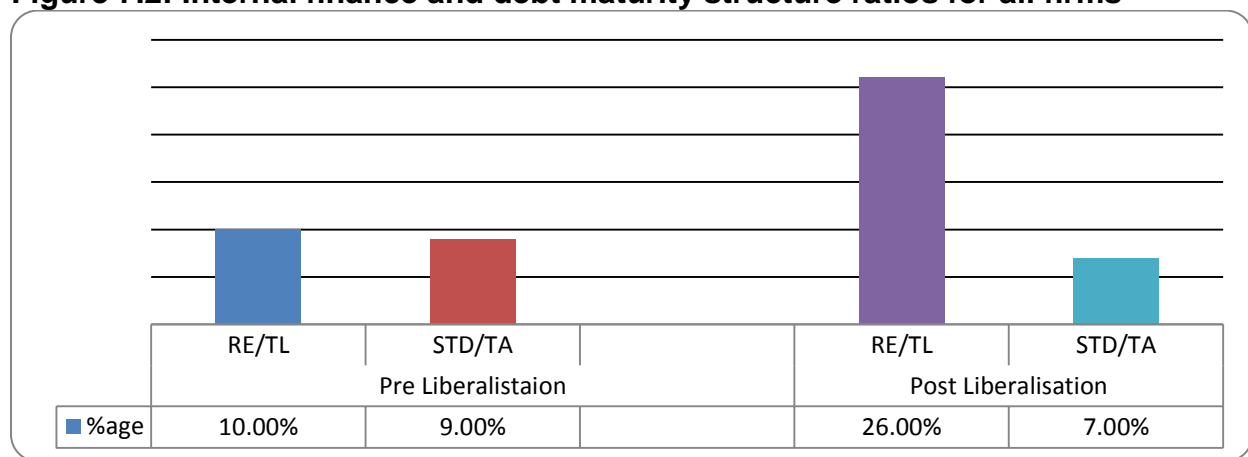


<sup>32</sup> See the appendix for details of these firms

### 7.3.2 Average retained earnings and debt maturity structure ratios for all firms

Figure 7.2 reports the importance of retained earnings and the maturity structure of debt in the context of financial liberalisation. The average value of retentions increases from 10 percent in the pre liberalisation period to 26 percent in the post liberalisation period. This increase implies that the importance of retained earnings has improved following financial liberalisation. The average short term debt ratio declines marginally from 9 percent to 7 percent. This decline suggests that financial liberalisation may have no significant effects on the maturity structure of debt for all firms.

**Figure 7.2: Internal finance and debt maturity structure ratios for all firms**



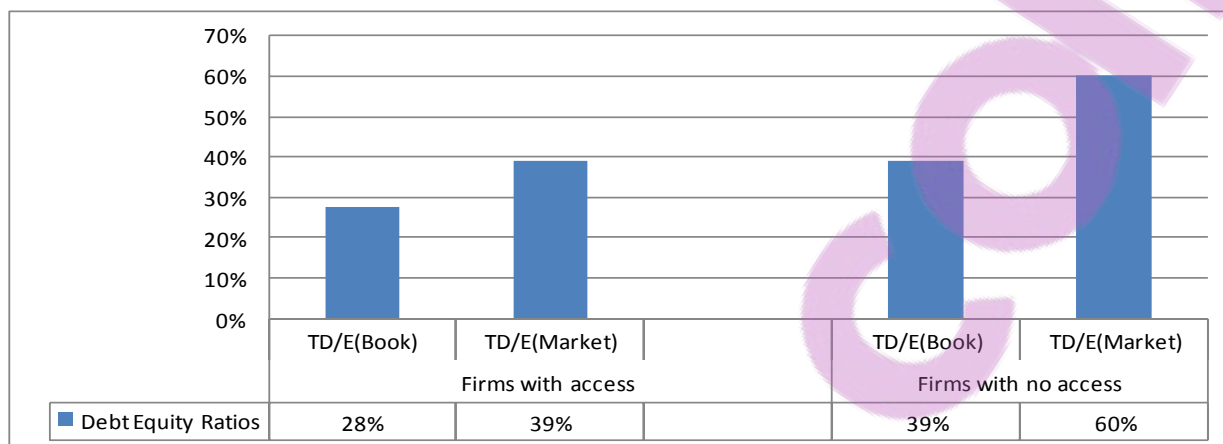
### 7.3.3 Average leverage ratios for internationally and domestically financed firms

To show the effects of firm participation in international equity markets, the data set is divided into internationally and domestically financed firms. Figure 7.3 shows the difference in the debt to equity ratios for both sets of firms. Internationally financed firms have lower average book and market value debt to equity ratios compared to domestically financed firms. The book value of the debt to equity ratio for domestically financed firms is 11 percent higher than that of the internationally financed firms. The market value ratio difference between the two sets of firms is even higher by 21 percent.

This observation is indicative that domestically financed firms rely principally on domestic debt. Hence, they have higher debt ratios. Similarly, internationally financed firms are expected to exhibit lower debt ratios. This is because firms with access to

international equity markets have the ability to access more equity through the process of cross listing and ADR issuing activity.

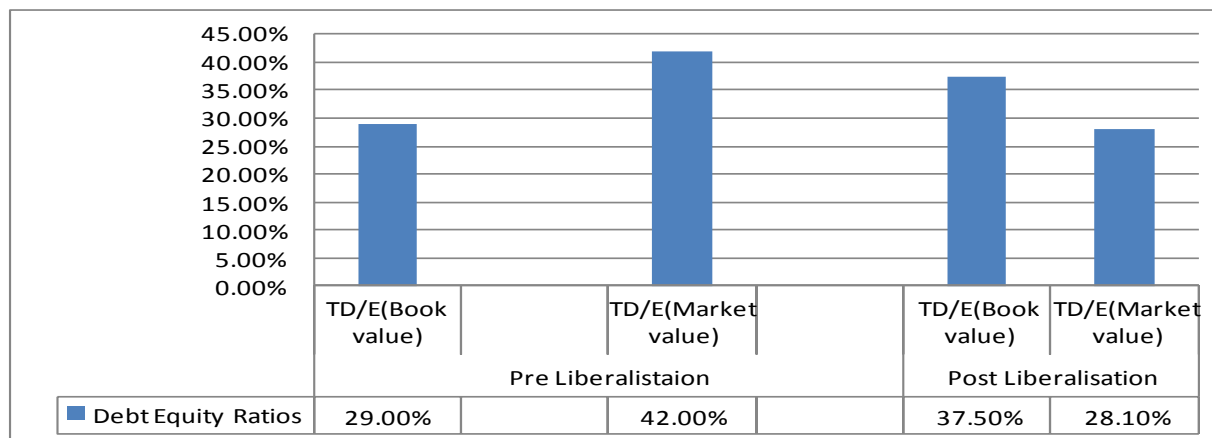
**Figure 7.3: Debt to equity ratios for internationally and domestically financed firms.**



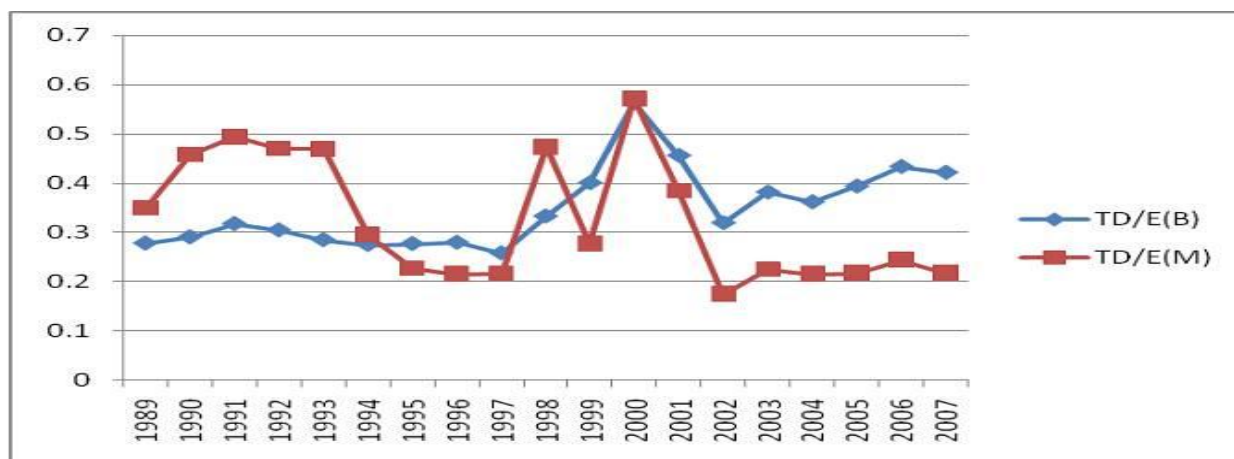
### 7.3.4 Average leverage ratios for internationally financed firms (pre and post liberalisation)

Figure 7.4 reports the average debt to equity ratios for internationally financed firms. The average book value of the debt to equity ratio increases with financial liberalisation, whereas the average market value of the debt to equity ratio reduces with financial liberalisation. An increase in the average book value ratio could suggest that firms are taking advantage of the lower cost of borrowing associated with financial liberalisation. As a result, debt becomes more appealing relative to equity. The reduction in the market value of the debt to equity ratio can be explained by the trend observed in figure 7.5. Before financial liberalisation, the average market value of the debt to equity ratio was higher than the average book value. After financial liberalisation, the opposite is observed. The average market value of the debt to equity ratio is substantially lower than the average book value.

**Figure 7.4: The effects of financial liberalisation on debt to equity ratios of internationally financed firms**



**Figure 7.5: The trend in the leverage ratios for internationally financed firms.**

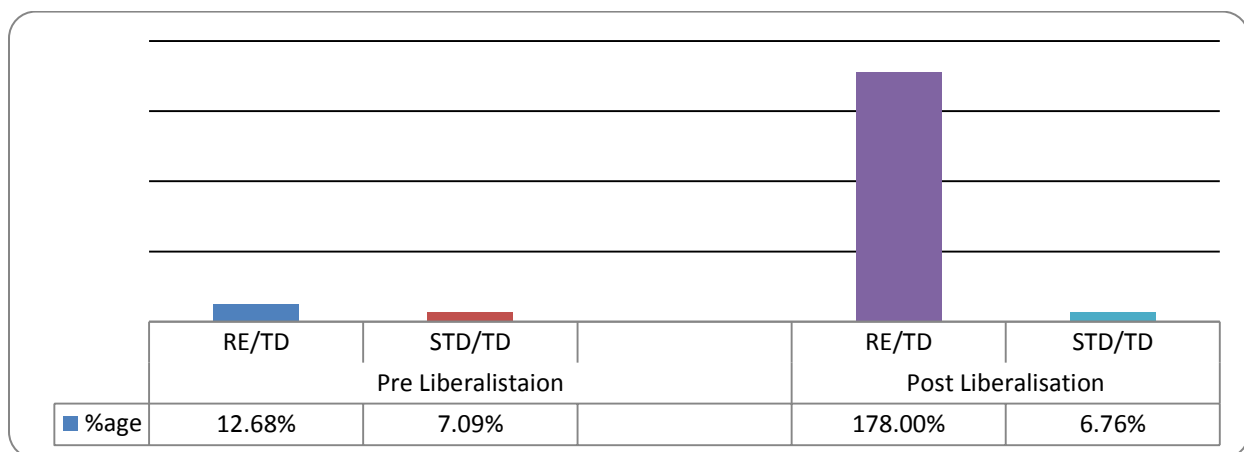


### 7.3.5 Average retained earnings and debt maturity structure ratios for internationally financed firms (pre and post liberalisation)

Figure 7.6 highlights the effects of financial liberalisation on internal finance and the maturity structure of debt for internationally financed firms. Again, the maturity structure of debt is not affected by financial liberalisation. This observation contrasts with Schmukler and Vesperoni (2006: 188) who document an increase in the average debt maturity structure of firms which participated in international equity issues. However, it can be observed that financial liberalisation impacts on firms' reliance on internal finance. The retained earnings ratio increases from 12.68 percent in the pre

liberalisation period to 178 percent after financial liberalisation. This increase is in line with the observed increase in retained earnings for the full sample set.

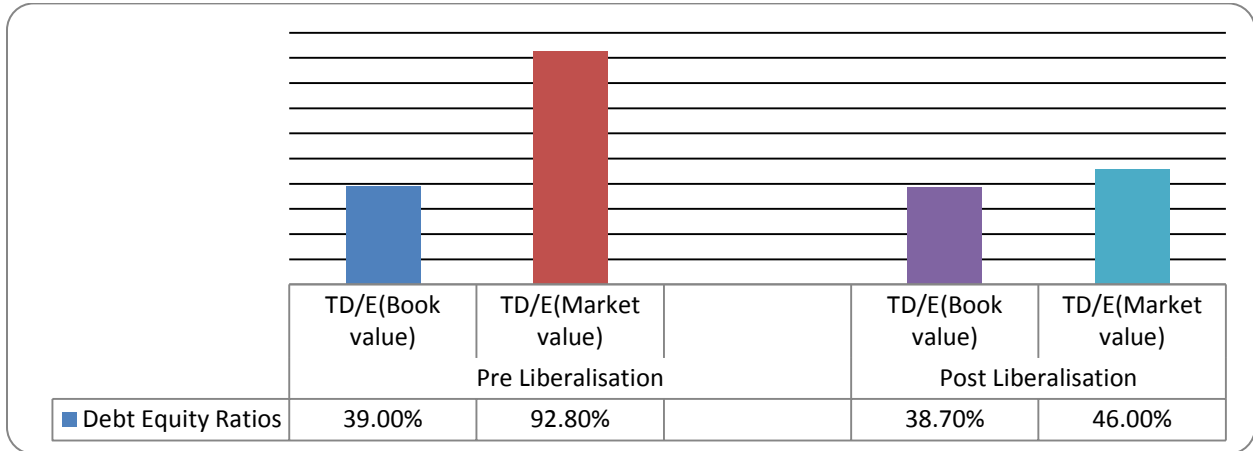
**Figure 7.6: The effects of financial liberalisation on internal finance and debt maturity structure of internationally financed firms**



### 7.3.6 Average leverage ratios for domestically financed firms (pre and post liberalisation)

Figure 7.7 shows a decline in the average debt to equity ratios for domestically financed firms. Although the average book value ratio did not change, the average market value ratio declined by 46.8 percent. This finding confirms Makina and Negash's (2005a: 154) observation that the cost of equity capital lowers following financial liberalisation. Consequently, financially constrained firms experience a rise in the market value of their equity, thereby experiencing a reduction in their debt ratios.

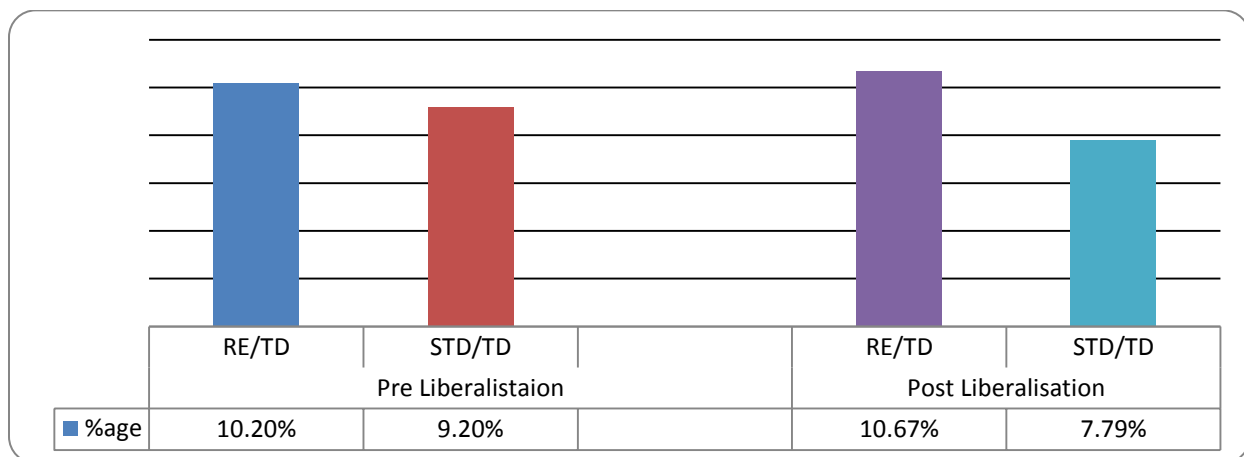
**Figure 7.7: The effects of financial liberalisation on debt equity ratios for domestically financed firms**



### 7.3.7 Average retained earnings and debt maturity structure ratios for domestically financed firms

Figure 7.8 reveals no material effects of financial liberalisation on the importance of internal finance and the maturity structure of debt for domestically financed firms. The observed ratios have not changed significantly.

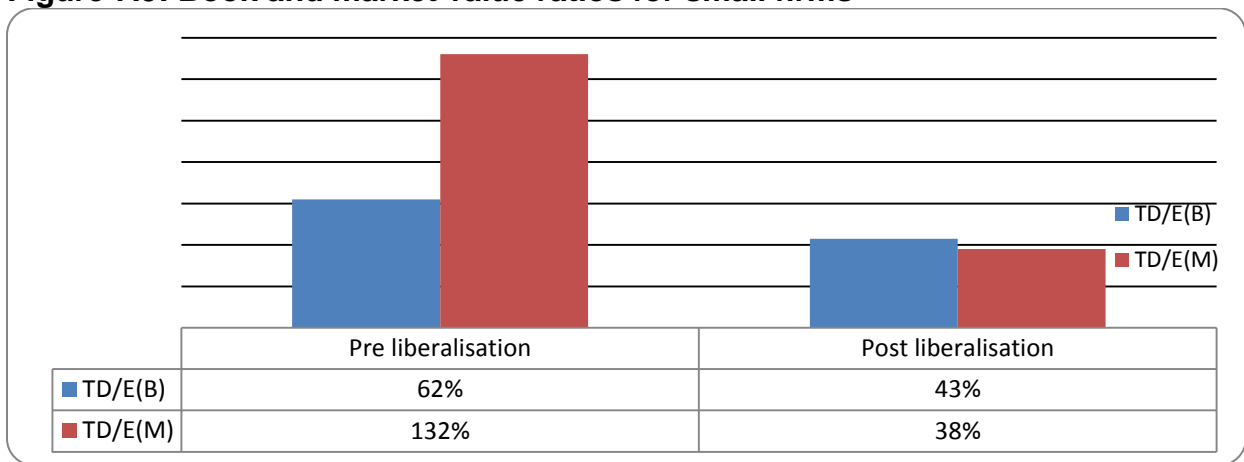
**Figure 7.8: The effects of financial liberalisation on internal finance and debt maturity structure for domestically financed firms**



### 7.3.8 Average leverage ratios for small firms (pre and post liberalisation)

Figure 7.9 shows the average book and market value of the debt to equity ratio for small firms. The average book ratio decreased by 19 percent and the average market ratio decreased by 94 percent. These reductions may indicate that financial liberalisation provides more financing opportunities for small firms. Particularly, smaller firms benefit from the lower cost of equity capital thus increasing their market value of equity relative to debt.

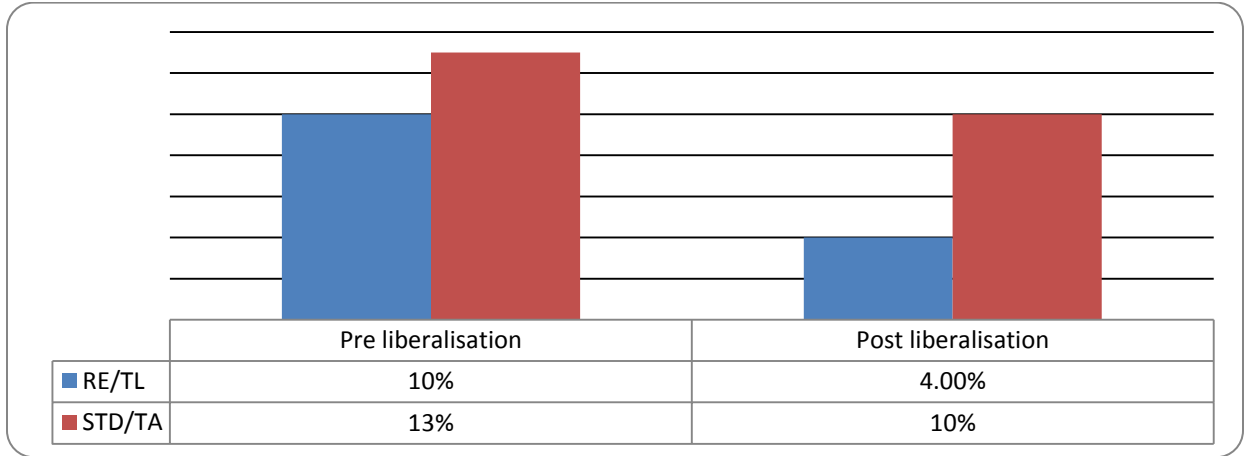
**Figure 7.9: Book and market value ratios for small firms**



### 7.3.9 Average retained earnings and debt maturity structure ratios for small firms (pre and post liberalisation)

Figure 7.10 highlights the importance of retained earnings and the maturity structure of debt for small firms. Smaller firms retain less income in the period after financial liberalisation. The average retained earnings to total liabilities ratio reduces by six percent. The average debt maturity structure shifts from short term to long term. This provides some indication that smaller firms become less constrained following financial liberalisation. They begin to access more long term debt. However, the reduction in the short term debt ratio is only marginal.

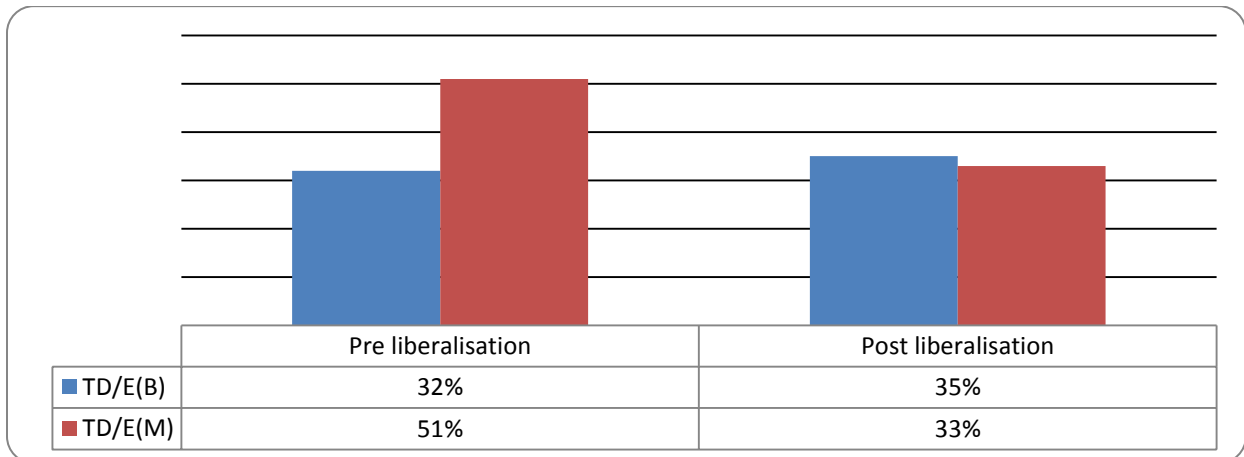
**Figure 7.10: Internal finance and debt maturity structure ratios for small firms**



### 7.3.10 Average leverage ratios for large firms (pre and post liberalisation)

Figure 7.11 shows the average debt to equity ratios for large firms. The average book value of the debt to equity ratio increases marginally over the period of observation. However, the average market value of the debt to equity ratio declines by 18 percent.

**Figure 7.11: Book and market value debt to equity ratios for large firms**

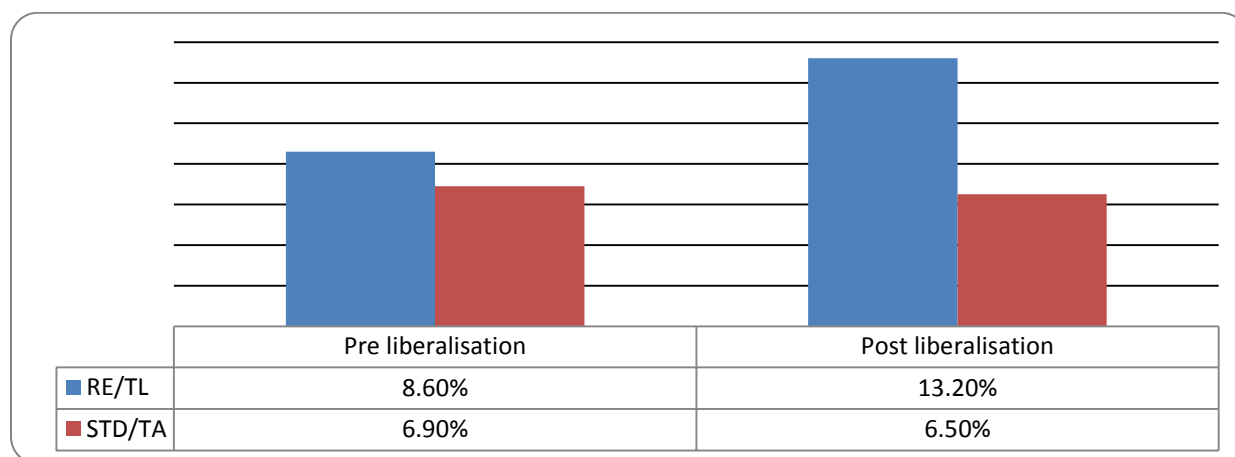




### 7.3.11 Average retained earnings and debt maturity structure ratios for large firms (pre and post liberalisation)

Figure 7.12 reveals that large firms retain more earnings, although the increase is only marginal. The maturity structure of debt is, however, stable over the two periods of observation.

**Figure 7.12: Internal finance and debt maturity structure ratios for large firms**



### 7.3.12 Summary of the contrasting effects of financial liberalisation

The descriptive statistics presented in this section imply that financial liberalisation may be associated with a lower average market value of the debt to equity ratio. This implication observed for the full sample set and for firms without access to international equity markets. Generally, the average book debt to equity ratio increases marginally for all sets of firms. However, a marginal reduction is observed for domestically financed firms. This observation can be attributed to the lower borrowing costs associated with debt in a liberalised economy. The maturity structure of debt seems to be unaffected by financial liberalisation. Nonetheless, internationally financed firms experience a large increase in the use of retained earnings for the period after financial liberalisation. This increase is in line with the increased use of internal finance for the average firm.

In terms of size, it appears that smaller firms are more responsive to the process of financial liberalisation compared to larger firms. Particularly, smaller firms experience a reduction in both the average book and market value of the debt to equity ratio. There is

also an indication that, following financial liberalisation, smaller firms retain less profits and access more long term debt. The next step is to test whether these effects are statistically significant while controlling for other factors that may influence firm leverage<sup>33</sup>.

## **7.4 REGRESSION OUTPUTS**

This section focuses specifically on presenting the regression outputs for the impact of financial liberalisation on capital structure. GLS regressions (with standard errors robust to heteroscedasticity) are reported for the fixed (within) and random effects models.

### **7.4.1 Organisation of the regression outputs.**

Tables 7.6 and 7.7 present regression results for the impact of financial liberalisation on the book and market values of leverage for all the firms in the data set. Tables 7.8 and 7.9 report the regression results for the impact of financial liberalisation on the book and market value measures of leverage for the full set of firms. Tables 7.10 and 7.11 show the regression outputs for the impact of financial liberalisation on the book and market values of leverage for large firms.

The Hausman (1978: 1251) specification test is used to establish which model (fixed or random effects) is suitable. Therefore, the pooled OLS and either the fixed or random effects models are presented in the results. This method of reporting is chosen because the fixed and random effects models report very similar correlations. To save on space, either of the two models is reported, based on the output from the Hausman (1978: 1251) test.

### **7.4.2 Models reported for the full sample set**

The p-values for the Hausman (1978: 1251) test are statistically significant at the 1 percent level for the book and market values of the debt to equity and the total debt ratios. Likewise, the p-value for the short term debt ratio is statistically significant at the

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<sup>33</sup> These are control variables discussed in section 5.4.2

5 percent level. The null hypothesis is thus rejected in favour of the fixed effects model. Therefore the fixed effects model is used to report the results for the full sample set.

#### **7.4.3 Models reported for small firms**

The p-values of the Hausman (1978: 1251) specification tests are statistically insignificant for the book and market values of the debt to equity ratio for the set of small firms. Therefore the null hypothesis cannot be rejected in favour of the fixed effects model. Hence, the random effects model is used to report the results for the book and market value measures of the debt to equity ratio of small firms. Nonetheless, the p-values for both measures of the total debt ratios are statistically significant. Therefore the fixed effects model is used to report the results for both measures of the total debt ratio for small firms.

#### **7.4.4 Models reported for large firms**

Using the same convention for the interpretation of the Hausman (1978: 1251) specification test, large firms' results are interpreted using the fixed effects model for the book value of the debt to equity ratio. The random effects model is used to report the results for the other measures of leverage. These are the book and market values of the total debt ratio and the short term debt ratio.

**Table 7.6: Panel data regression results for all firms**

Variables	Fixed Effects Model		Pooled OLS Model	
	Td/e(book)	Td/e(market)	Td/e(book)	Td/e(market)
<b>Growth</b>	0.01464 (0.329)	-0.06177 (0.16)	0.0137 (0.0189)	-0.0477 (0.0000)***
<b>Tangibility</b>	0.527163 (0.025)**	0.454448 (0.693)	0.0631 (0.000)***	0.0839 (0.3035)**
<b>Profitability</b>	-0.13973 (0.507)	5.51497 (0.056)*	-0.3899 (0.0000)	-0.4254 (0.0000)***
<b>Size</b>	0.438301 (0.082)*	-1.81533 (0.930)	-0.0423 (0.2039)	-0.0874 (0.0000)
<b>IFF</b>	(omitted)	(omitted)	0.0254 (0.6086)	0.0034 (0.9535)
<b>LIS</b>	-0.20215 (0.004)***	0.610091 (0.232)	-0.0527 (0.0011)***	-0.0759 (0.0000)***
<b>SML</b>	-0.0992 (0.309)	-1.10143 (0.031)**	-0.0416 (0.2180)	-0.1143 (0.0000)***
<b>CAL</b>	0.2510 (0.085)*	1.118458 (0.066)*	0.1405 (0.0218)**	0.2133 (0.0001)**
<b>DFSL</b>	0.205855 (0.094)*	-1.45157 (0.232)	0.0020 (0.9559)	0.0454 (0.0342)
<b>SMCGDP</b>	0.347038 (0.004)***	-0.33555 (0.358)	0.1525 (0.0000)***	0.1609 (0.0000)
<b>DCGDP</b>	-0.19859 (0.003)***	-0.311675 (0.309)	-0.0931 (0.0000)**	-0.0984 (0.0000)
<b>Constant</b>	-0.889 (0.238)	1.104962 (0.641)	0.7573 (0.0006)***	1.1603 (0.0000)***
<b>F(11,99)</b>	3.6	4.74		
<b>Prob &gt; F</b>	0.000	0.0000	0.0000	0.0000
<b>R-sq:</b>	0.0876	0.2549	0.5208	0.5642
<b>Wald chi2(11)</b>			41.4	119.97
<b>P&gt;chi2</b>			0.0000	0.0000
<b>Hausman Test:</b>				
<b>chi2(11)</b>	49.5	40.86		
<b>Prob&gt;chi2</b>	0.0000	0.0000		
<b>No. Of observations</b>	1029	1029	1029	1029

Notes: This table reports fixed (within) effects and pooled OLS regression outputs for the impact of financial liberalisation on the capital structure of all the firms. TD/E (B) is calculated as the book value of total interest bearing debt divided by the book value of equity. TD/E (M) is calculated as total interest bearing debt divided by the market value of equity. The control variables are Growth, Tangibility, Profitability and Size. IFF is a dummy variable capturing individual firm access to international equity markets. LIS is a dummy variable capturing the lifting of international sanctions. SML is a dummy variable representing stock market liberalisation. CAL is a dummy variable capturing capital account liberalisation. DFSL is a dummy variable representing domestic financial sector liberalisation. SMCGDP and DCGDP are measures of stock and banking sector development respectively. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels respectively.

**Table 7.7: Panel data regression results for all firms**

Variables	Fixed Effects Model		Random Effects	Pooled OLS Model		
	Td/Ta(book)	Td/Ta(market)	Std/Ta	Td/Ta(book)	Td/Ta(market)	Std/Ta
<b>Growth</b>	0.003 (0.081)*	-0.0063 (0.034)**	0.001 (0.475)	0.0024 (0.4338)**	-0.0038 (0.3660)**	0.0046 (0.2862)
<b>Tangibility</b>	0.244 (0.001)***	0.248 (0.000)***	-0.017 (0.644)	0.2128 (0.0000)***	0.1986 (0.000)***	-0.0031 (0.8713)
<b>Profitability</b>	-0.2295 (0.017)**	-0.2012 (0.039)**	-0.1834 (0.084)*	-0.0959 (0.0051)**	-0.1342 (0.0584)**	-0.1028 (0.0000)*
<b>Size</b>	0.0388 (0.355)	0.0154 (0.615)	-0.0255 (0.015)**	0.0245 (0.4443)	-0.0357 (0.0001)	-0.029 (0.0129)**
<b>IFF</b>	Omitted	Omitted	0.0148 (0.490)	-0.0069 (0.8697)	-0.009 (0.7232)	0.0162 (0.3987)
<b>LIS</b>	-0.0346 (0.011)**	-0.0467 (0.006)***	-0.0027 (0.888)	-0.0198 (0.0002)**	-0.0134 (0.5255)***	0.0159 (0.0059)
<b>SML</b>	-0.0258 (0.101)	-0.0631 (0.003)***	-0.0288 (0.070)*	-0.0356 (0.0257)**	-0.0627 (0.0759)*	-0.0584 (0.000)***
<b>CAL</b>	0.0487 (0.049)**	0.0404 (0.337)	0.0328 (0.254)	0.0737 (0.0336)	0.0693 (0.3551)	0.0944 (0.000)
<b>DFSL</b>	0.0166 (0.441)	0.0084 (0.783)	-0.0340 (0.216)	-0.0006 (0.7177)	-0.0185 (0.6816)	-0.0075 (0.0000)
<b>SMCGDP</b>	0.0617 (0.029)**	0.0325 (0.382)	0.0390 (0.091)*	0.0526 (0.0035)***	0.0307 (0.4341)	0.0374 (0.000)***
<b>DCGDP</b>	-0.035 (0.023)**	0.0038 (0.828)	0.0001 (0.991)	-0.0422 (0.0193)*	-0.0075 (0.7832)	-0.0081 (0.1859)
<b>Constant</b>	-0.0378 (0.872)	0.0502 (0.765)	0.251 (0.000)***	0.10132 (0.6006)	0.3813 (0.0010)***	0.3195 (0.0000)***
<b>F(11,99)</b>	5.24	8.91	4.6			
<b>Prob &gt; F</b>	0.0000	0.0000	0.000	0.0000	0.0000	0.0000
<b>Adjusted R-sq:</b>	0.1021	0.2022	0.1108	0.5777	0.4431	0.3559
<b>Wald chi2(11)</b>			33.88			
<b>P&gt;chi2</b>			0.004			
<b>Hausman Test:</b>						
	54.44	24.69	13.73			
<b>chi2(11)</b>						
	0.0000	0.0101	0.248			
<b>Prob&gt;chi2</b>						
<b>No. Of observations</b>	1029	1029	1029	1029	1029	1029

Notes: This table reports fixed effects, random effects and pooled OLS regression outputs for the impact of financial liberalisation on the capital structure of all firms. Variables are as defined in the notes to table 7.6. STD/TA is the ratio of the book value of short term interest bearing debt to the book value of total assets. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels of significance.

**Table 7.8: Panel data regression results for small firms**

Variables	Random Effects Model		Pooled OLS Model	
	Td/e(book)	Td/e(market)	Td/e(book)	Td/e(market)
<b>Growth</b>	0.0370 (0.102)	-0.0785 (0.183)	0.013702** (0.0189)	-0.04769 *** (0.0000)
<b>Tangibility</b>	0.3163 (0.201)	0.4038 (0.517)	0.281015*** (0.0000)	0.08393 (0.3035)
<b>Profitability</b>	-0.7240 (0.249)	-0.3107 (0.827)	-0.389931*** (0.0000)	-0.42539 *** (0.0000)
<b>Size</b>	0.2239 (0.217)	-0.2858 (0.658)	-0.042265 (0.2039)	-0.08744*** (0.0002)
<b>IFF</b>	0.3872 (0.133)	0.2903 (0.713)	0.025400 (0.6086)	0.003411 (0.9535)
<b>LIS</b>	-0.2961** (0.035)	1.1622 (0.346)	-0.052744 *** (0.0011)	-0.07594 (0.7210)
<b>SML</b>	-0.2087 (0.162)	-1.5648 (0.113)	-0.041570 (0.2180)	-0.11430 *** (0.0000)
<b>CAL</b>	0.1968 (0.428)	1.1067 (0.310)	0.140516 ** (0.0218)	0.213320 *** (0.0001)
<b>DFSL</b>	0.1746 (0.348)	-2.6193 (0.271)	0.001967 (0.9559)	0.045425 ** (0.0342)
<b>SMCGDP</b>	0.4378** (0.032)	-1.1008 (0.174)	0.152511 *** (0.0000)	0.160947 *** (0.0000)
<b>DCGDP</b>	-0.1865* (0.064)	0.9161 (0.187)	-0.093144*** (0.0000)	-0.09839 *** (0.0000)
<b>Constant</b>	-0.3510 (0.680)	2.1542 (0.454)	0.757314 *** (0.0006)	1.16030*** (0.0000)
<b>Adjusted R-sq:</b>	0.0778	0.1996	0.5209	0.5642
<b>Wald chi2(11)</b>	19.11	100.99		
<b>P&gt;chi2</b>	0.0591	0.0000		
<b>Prob (F Statistic)</b>			0.0000	0.0000
<b>Hausman Test:</b>				
<b>chi2(11)</b>	12.02	1.04		
<b>Prob&gt;chi2</b>	0.3620	0.9999		
<b>No. Of observations</b>	539	539	539	539

Notes: This table reports random effects and pooled OLS regression outputs for the impact of financial liberalisation on the capital structure of small firms. Variables are as defined in the notes to table 7.6. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels of significance respectively.

**Table 7.9: Panel data regression results for small firms**

Variables	Fixed Effects Model			Pooled OLS Model		
	Td/Ta(book)	Td/Ta(market)	Std /Ta	Td/Ta(book)	Td/Ta(market)	Std/Ta
<b>Growth</b>	0.0028 (0.216)	-0.0074* (0.053)	0.0008 (0.8360)	0.002443 (0.4338)	-0.00375 (0.3660)	0.00462 (0.2862)
<b>Tangibility</b>	0.2638*** (0.009)	0.3072*** (0.001)	0.0551 (0.4430)	0.21278*** (0.0000)	0.19855*** (0.0000)	-0.00306 (0.8713)
<b>Profitability</b>	-0.0928 (0.301)	-0.0852 (0.535)	-0.0737 (0.3150)	-0.09596 (0.0051)	-0.13417* (0.0584)	- (0.0000)
<b>Size</b>	0.0792* (0.093)	0.0031 (0.952)	0.0386 (0.2270)	0.02452 (0.4443)	-0.0357*** (0.0010)	-0.02960** (0.0129)
<b>IFF</b>	(Omitted)	(Omitted)	(omitted)	-0.00691 (0.8697)	-0.00945 (0.7232)	0.01623 (0.3987)
<b>LIS</b>	-0.0453** (0.040)	-0.0743** (0.014)	-0.0208 (0.2910)	-0.01979 (0.0002)	-0.0133 (0.5255)	0.01596*** (0.0059)
<b>SML</b>	0.0004 (0.987)	-0.0174 (0.485)	-0.0224 (0.2630)	-0.03559 ** (0.0257)	-0.0627* (0.0759)	- (0.0000)
<b>CAL</b>	-0.0357 (0.276)	-0.0892 (0.215)	0.0163 (0.6370)	0.073747 ** (0.0336)	0.06927 (0.3551)	0.09441*** (0.0000)
<b>DFSL</b>	0.0098 (0.778)	0.0222 (0.647)	-0.0265 (0.3230)	-0.00606 (0.7177)	-0.0185 (0.6816)	- (0.0000)
<b>SMCGDP</b>	0.0014 (0.969)	0.0085 (0.812)	0.0253 (0.3830)	0.05255 *** (0.0035)	0.03066 (0.4341)	0.04269** (0.0374)
<b>DCGDP</b>	-0.0133 (0.592)	0.0276 (0.308)	-0.0064 (0.7110)	-0.04221 ** (0.0193)	-0.0075 (0.7832)	-0.00807 (0.1859)
<b>Constant</b>	-0.2010 (0.358)	0.1120 (0.653)	-0.0588 (0.6920)	0.101324 (0.6006)	0.38134 (0.0010)	0.31955*** (0.0000)
<b>F(11,48)</b>	5.42	4.60				
<b>Prob &gt; F</b>	0.0000	0.0001			0.0000	
<b>Adjusted R-sq:</b>	0.1899	0.149		0.5777	0.4431	0.3559
<b>Prob (F Statistic)</b>				0.0000	0.0000	
<b>Hausman Test:</b>						
<b>chi2(11)</b>	38.48	28.29				
<b>Prob&gt;chi2</b>	0.0001	0.0029				
<b>No. of observations</b>	539	539		539	539	

Notes: This table reports fixed effects and pooled OLS regression outputs for the impact of financial liberalisation on the book and market measures of total debt ratios for small firms. Variables are as defined in the notes to table 7.6. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels of significance.

**Table 7.10: Panel data regression results for large firms**

	Fixed Effects Model	Random effects	Pooled OLS	
Variables	Td/e(book)	Td/e(market)	Td/e(book)	Td/e(market)
<b>Growth</b>	-0.01282 (0.452)	-0.02426 (0.315)	0.002172 (0.7403)	0.0001 (0.9455)
<b>Tangibility</b>	0.508597* (0.072)	-0.22785 (0.501)	0.270410*** (0.0033)	0.1619* (0.0593)
<b>Profitability</b>	1.412357*** (0.003)	-3.01285*** (0.000)	0.312108** (0.0379)	-2.1194*** (0.0000)
<b>Size</b>	0.210367*** (0.009)	-0.11084 (0.497)	0.063573* (0.0817)	-0.0122 (0.7213)
<b>IFF</b>	(omitted)	-0.01368 (0.934)	0.003948 (0.9446)	-0.0489 (0.3163)
<b>LIS</b>	-0.15872*** (0.006)	0.120288 (0.371)	-0.028727 (0.3793)	0.02401 (0.4686)
<b>SML</b>	-0.01343 (0.870)	-0.55625*** (0.004)	-0.0759 (0.1124)	-0.1728*** (0.0002)
<b>CAL</b>	0.158736 (0.166)	1.021253*** (0.002)	0.1631* (0.0831)	0.3242*** (0.0005)
<b>DFSL</b>	0.234635* (0.058)	-0.24554 (0.396)	0.0287 (0.5943)	-0.0509 (0.3520)
<b>SMCGDP</b>	0.356991*** (0.006)	0.098856 (0.603)	0.1382** (0.0142)	0.0402 (0.4734)
<b>DCGDP</b>	-0.16191** (0.045)	-0.18894** (0.012)	-0.0421 (0.2919)	-0.018** (0.012)
<b>Constant</b>	-1.2353** (0.011)	2.120165** (0.032)	-0.3070 (0.2436)	0.5258** (0.0357)
<b>F(11,48)</b>	3.67			
<b>Prob &gt; F</b>	0.008			
<b>Adjusted R-sq:</b>	0.2648	0.1996	0.5455	0.6127
<b>Wald chi2(11)</b>		100.99		
<b>P&gt;chi2</b>		0.0000		
<b>Prob (Fstatistic)</b>			0.0000	0.0000
<b>Hausman Test:</b>				
<b>chi2(11)</b>	99.98	4.61		
<b>Prob&gt;chi2</b>	0.0000	0.9488		
<b>No. Of observations</b>	539	539	539	539

Notes: This table reports fixed effects, random effects and pooled OLS regression outputs for the impact of financial liberalisation on the book and market measures of debt to equity ratios of large firms. Variables are as defined in the notes to table 7.6. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels of significance.



**Table 7.11: Panel data regression results for large firms**

Variables	Random Effects Model			Pooled OLS Model		
	Td/Ta(book)	Td/Ta(market)	Std/Ta	Td/Ta(book)	Td/Ta(market)	Std/Ta
<b>Growth</b>	0.0076*** (0.000)	-0.0038 (0.253)	0.0041 (0.225)	0.0051*** (0.0033)	-0.0045*** (0.0035)	0.0008 (0.4753)
<b>Tangibility</b>	0.0996 (0.205)	0.1089 (0.137)	-0.0786 (0.087)*	0.136925*** (0.0001)	0.1732*** (0.000)	-0.0355** (0.0256)
<b>Profitability</b>	-0.3662*** (0.000)	-0.3146*** (0.000)	-0.3067*** (0.001)	-0.2884*** (0.0000)	-0.2696*** (0.0000)	-0.2192*** (0.000)
<b>Size</b>	0.0099 (0.826)	0.0245 (0.256)	-0.0335 (0.109)	0.021095 (0.1128)	0.0224* (0.0607)	0.0008 (0.9167)
<b>IFF</b>	0.0043 (0.911)	-0.0387 (0.216)	0.0248 (0.247)	0.035517 (0.2168)	-0.0305** (0.0255)	0.0107 (0.2767)
<b>LIS</b>	-0.0261* (0.097)	-0.0162 (0.379)	0.0131 (0.699)	-0.0071 (0.4788)	-0.0042 (0.7314)	0.0064 (0.3782)
<b>SML</b>	-0.0466** (0.028)	-0.1031*** (0.001)	-0.0423** (0.023)	-0.0379** (0.0131)	-0.0610*** (0.0003)	-0.0249** (0.0128)
<b>CAL</b>	0.1203*** (0.000)	0.1653*** (0.000)	0.0696* (0.094)	0.0669** (0.0247)	0.0932*** (0.0053)	0.0357* (0.0710)
<b>DFSL</b>	0.0357 (0.256)	0.0059 (0.881)	-0.0339 (0.482)	0.0060 (0.7115)	-0.0042 (0.8318)	-0.0080 (0.4976)
<b>SMCGDP</b>	0.0978*** (0.002)	0.0309 (0.644)	0.0483* (0.056)	0.0563*** (0.0012)	0.0157 (0.4441)	0.0205* (0.0992)
<b>DCGDP</b>	-0.0548*** (0.005)	-0.0192 (0.400)	-0.0095 (0.448)	-0.0164 (0.2937)	-0.0035 (0.7835)	-0.0061 (0.4234)
<b>Constant</b>	0.1679 (0.539)	0.0477 (0.695)	0.3407** (0.011)	-0.0608 (0.5818)	-0.0256 (0.7521)	0.0838 (0.1081)
<b>Adjusted</b>						
<b>R-sq:</b>	0.2355	0.1495	0.1861	0.7658	0.62818	0.5029
<b>Wald</b>	726.78	151.9	64.03			
<b>chi2(11)</b>						
<b>P&gt;chi2</b>	0.0000	0.0000	0.0000			
<b>Prob</b>				0.0000	0.0000	0.0000
<b>(Fstatistic)</b>						
<b>Hausman</b>						
<b>Test:</b>						
<b>chi2(11)</b>	6.64	5.67	6.52			
<b>Prob&gt;chi2</b>	0.8274	0.8944	0.9583			
<b>No. of observations</b>	539	539	539	539	539	539

Notes: This table reports fixed effects and pooled OLS regression outputs for the impact of financial liberalisation on the book and market value measures of total debt ratios of large firms. Variables are as defined in the notes to table 7.6. Standard errors are robust to heteroscedasticity. P-values are in parentheses and \*\*\*, \*\*, \* indicate levels of significance at the 1%, 5% and 10% levels of significance.

## 7.5 RESULTS AND PRESENTATION OF HYPOTHESES

This section discusses the results that have been reported for the fixed (within), random and pooled OLS models. The results are presented in terms of the formulated hypotheses. The null and alternative hypotheses are either confirmed or rejected by the empirical findings.

### 7.5.1 Results and presentation of hypothesis one

Hypothesis one is restated as follows:

**$H_o$  = Stock market liberalisation has no significant impact on the book and market values of leverage ratios of all sets of listed firms.**

**$H_a$  = Stock market liberalisation has a significant impact on the book and market values of leverage ratios of all sets of listed firms.**

According to Makina and Negash (2005a: 145), stock market liberalisation is associated with a significant decline in the cost of equity capital for most of the South African listed firms. If this is the case, then leverage ratios are expected to decline due to the subsequent increase in equity prices. The empirical relationship which has been tested is whether stock market liberalisation has a significant impact on firm leverage. The independent variables of interest are the *IFF*, *DFF* and *SML*. *IFF* is a dummy that represents internationally financed firms. It captures individual firm access to international equity markets. *DFF* is a dummy that represents domestically financed firms. Given the observation in figure 7.1, in section 7.2.4, financial liberalisation, in general, is associated with a general decline in the average value of the market value ratio of leverage. This observation needs to be assessed further while controlling for other factors in the robust regressions.

- **Regression results for all the firms**

Tables 7.6 and 7.7 report the regression results for the full sample of firms using the fixed (within) effects and pooled OLS models. Due to perfect collinearity, the dummy variable *IFF*, which represents firm participation in international equity markets, is dropped by the fixed (within) effects model. However, both the random effects and pooled OLS models report negative and insignificant coefficients for this variable. Furthermore, the *SML* dummy is interacted with both the *IFF* and *DFE* variables for all regressions, and the results are insignificant<sup>34</sup>. It appears that firms with access to international equity markets and domestically financed firms are not significantly affected by stock market liberalisation. Hence, there is no need to include interaction dummies in the regression output.

The impact of stock market liberalisation on leverage for the full sample reveals some important facts. Figure 7.1 showed that the average market value of the debt to equity ratio declined from 59 percent in the pre liberalisation period to 40 percent in the post liberalisation period. This observation is confirmed by the regression results. The *SML* variable is inversely correlated with the debt to equity ratios. The relationship is significant at the 5 percent level for the market value debt to equity ratio.

The pooled OLS model also reports a significant reduction in leverage at the 1 percent level. Again, a statistically significant negative association is reported for the market value of the total debt ratio. An increase of 1 percent in the *SML* variable is associated with a 6.3 percent reduction in the market value of the total debt ratio. The pooled OLS model reports a similar correlation for the market value of the total debt ratio. From these observations, the null hypothesis is rejected in favour of the alternative that stock market liberalisation is associated with a reduction in the market value of leverage. These findings corroborate favourably with Galego and Loayza (2000: 28), Bhaduri (2000: 413), Schmukler and Vesperoni (2006: 192) and Flavin and O'Connor

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<sup>34</sup> The *DFE* dummy is not reported in the regression output because it is insignificant for all the regressions.

(2010: 195) that stock market liberalisation is associated with a significant reduction in leverage for firms in emerging markets.

- **Regression results for small firms**

According to Figures 7.9 and 7.10 the average book and market value ratios for small firms reduce following financial liberalisation. Further analysis as reported in Tables 7.8 and 7.9 confirms this reduction but the associated coefficients for the book and market values of the debt to equity ratios are statistically insignificant. The pooled OLS model reports a significant negative association for the market value of the debt to equity ratio. The fixed effect model reports insignificant results for the total debt ratios, but the correlations are negative. The pooled OLS model documents some moderate evidence of a significant negative impact of stock market liberalisation on the total debt ratios for small firms.

Overall, there is a consistent negative correlation between stock market liberalisation and small firm leverage, but the significance of this impact is mildly supported. The null hypothesis cannot be rejected in favour of the alternative that stock market liberalisation is associated with a significant reduction in leverage for small firms. The only exception is the pooled OLS model which confirms the alternative hypothesis for the market value of the debt to equity ratio and both measures of the total debt ratios for small firms.

- **Regression results for large firms**

Figure 7.12 shows that the average market value of the debt to equity ratio declines by 18 percent over the period of financial reforms. This observation has been confirmed by the regression analysis. Furthermore, Tables 7.10 and 7.11 show that large firms are more responsive to the process of financial liberalisation than small firms. The coefficients for the market values of leverage are statistically significant at the 1 percent level. The coefficient for the book value of the total debt ratio is negative and significant at the 5 percent level. The correlation coefficient for the book value of the debt to equity ratio is negative and insignificant. Therefore, the book and market values of total

leverage and the market value of the debt to equity ratio confirm the alternative hypothesis that stock market liberalisation has a significant impact on leverage. These negative correlations are confirmed by the pooled OLS. The null hypothesis is accordingly rejected in favour of the alternative that stock market liberalisation has a significant impact on the market value of leverage for large firms.

These results compare favourably with Demircuc-Kunt and Maksimovic (1996: 341) who document a significant decrease in leverage ratios for large firms in developing countries. Similarly, Bhaduri (2000: 413) finds that financial liberalisation reduces the marginal propensity to debt, and the effect is more pronounced for larger firms. This evidence seems to imply that the opening up of the stock market causes foreign investors to prefer larger firms over their smaller counterparts.

### **7.5.2 Results and presentation of hypothesis two**

Hypothesis two is restated as follows:

***$H_o$  = The lifting of international sanctions has no significant impact on the book and market leverage ratios of all sets of listed firms.***

***$H_a$  = The lifting of international sanctions has a significant impact on the book and market leverage ratios of all sets of listed firms***

- **Regression results for all firms**

The *LIS* variable captures the impact of the lifting of international sanctions on leverage. It is associated with a significant reduction in the book value of the debt to equity ratio for all the firms in the analysis. As shown in Table 7.6, an increase of 1 percent in the *LIS* variable is associated with a 20.2 percent reduction in the book value of the debt to equity ratio. The relationship for the market value of the debt to equity ratio is insignificant. The pooled OLS model reports similar correlations but both measures of leverage are affected significantly. Table 7.7 reports a significant negative association

between the *LIS* variable and the book value of the total debt ratio. The coefficient is statistically significant at the 5 percent level for the book value of the debt to equity ratio. The same negative association is revealed for the market value of the total ratio. The coefficient is significant at the 1 percent level. Both the fixed effects and pooled OLS models have yielded similar correlations.

This outcome suggests that the lifting of international sanctions causes a reduction in leverage for the full sample. The negative correlation between the *LIS* variable and leverage is not surprising, due to the detection of a structural break in the cost of equity variable at the end of 1992 by Makina and Negash (2005b: 61). The lifting of international sanctions could have reduced the risk associated with the sanctions and hence lowered the required rate of return on equities. The reduction in leverage at this point indicates that besides direct legal barriers, economic and political impediments are significant constraints to firm access to equity. The null hypothesis is therefore rejected in favour of the alternative that the lifting of international sanctions has a significant impact on leverage for all firms.

- **Regression results for small firms**

The lifting of international sanctions has a negative impact on small firms' leverage. As seen in Tables 7.8 and 7.9, the coefficient of the *LIS* variable is significant at the 5 percent level for the book value debt to equity ratio and both measures of the total debt ratio. The coefficient for the market value of the debt to equity ratio is statistically insignificant. A similar relationship is reported by the pooled OLS model. The picture that is emerging out of this finding is that economic and political factors (particularly, the lifting of international sanctions) seem to have a stronger impact on leverage for small firms than direct legal barriers (particularly, the opening up of the stock market). Therefore, the null hypothesis is rejected in favour of the alternative that the lifting of international sanctions has a significant impact on small firm leverage.

- **Regression results for large firms**

The correlations reported in Tables 7.10 and 7.11 show mild support for the alternative hypothesis that the lifting of international sanctions has a significant impact on leverage for large firms. The only strong correlation reported is for the book value of the debt to equity ratio. The associated p-value is statistically significant at the 1 percent level. The book value of the total debt ratio is negatively correlated to the *L/S* variable at the 10 percent level of significance. All the correlations for the market measures of leverage are insignificant. This outcome leads to two conclusions. Firstly, large firms do not respond to economic and political barriers as much as small firms do. Secondly, large firms are less affected by economic and political constraints than they are to direct legal barriers, particularly with stock market liberalisation. The null hypothesis is therefore rejected in favour of the alternative hypothesis that the lifting of international sanctions has a significant impact on the book value measures of leverage for large firms. Nonetheless, the null hypothesis cannot be rejected for the market value measures of leverage.

### 7.5.3 Results and presentation of hypothesis three

Hypothesis three is restated as follows:

***H<sub>0</sub> = Exchange control relaxations have no significant impact on the book and market leverage ratios of all sets of listed firms.***

***H<sub>a</sub> = Exchange control relaxations have a significant impact on the book and market leverage ratios of all sets of listed firms.***

- **Regression results for all firms**

The results shown in Tables 7.6 and 7.7 indicate a direct relationship between exchange control relaxations and leverage for the full sample set. The variable of importance here is *CAL* which captures the effect of exchange control relaxations on

firm leverage. The results show that exchange control relaxations are associated with an increase in most measures of leverage for the full sample. The relationship is significant at the 10 percent level for the market value of the debt to equity ratio. The pooled OLS model reports significant positive correlations between the *CAL* dummy and leverage. The relationship is significant at the 5 percent level for both the book and market value of the debt to equity ratio. In terms of the total debt ratios, only the book value of total debt ratio is statistically significantly correlated to the exchange control relaxations. The coefficient is statistically significant at the 5 percent level.

This outcome may suggest that as exchange controls are relaxed, domestic firms respond by repatriating more investment funds abroad. These funds could be sourced from the local financial institutions. Given that debt is cheaper than equity, firms may issue debt to finance foreign investment.

Schmukler and Vesperoni (2006: 196) also document a positive but insignificant association between capital account liberalisation and leverage for a sample of firms in emerging market economies. The null hypothesis is accordingly rejected in favour of the alternative that exchange control relaxations are associated with an increase in the book and market values of the debt to equity ratio and the book value of the total debt ratio respectively. The null hypothesis is, on the other hand, not rejected for the market value of the total debt ratio.

- **Regression results for small firms**

Tables 7.8 and 7.9 show that exchange control relaxations are associated with an increase in leverage for small firms, but this relationship is statistically insignificant. The coefficient of the *CAL* variable is positive and statistically insignificant for all the measures of leverage. In contrast, the pooled OLS model reports significant positive coefficients for both measures of the debt to equity ratio. The same effect is documented for the book value of the total debt ratio. This contradiction could be as a result of the difference in the assumptions of both models as the pooled OLS fails to account for firm effects. Ozkan (2001: 186) argues that the presence of unobserved firm



specific effects leads to biased OLS estimation because of the possible correlation between the firm effects and the covariates. Based on the strength of the fixed (within) and random effects models, the null hypothesis cannot be rejected in favour of the alternative that exchange control relaxations are associated with a significant increase in the book and market value measures of leverage for small firms.

- **Regression results for large firms**

The effect of relaxing exchange controls is more pronounced for large firm leverage. According to Tables 7.10 and 7.11, the coefficients of the *CAL* variable are strongly significant for most of the measures of leverage except for the book value of the debt to equity ratio. The high levels of significance suggest that, compared to small firms, large firms benefit most from exchange control relaxations. This finding is plausible because large firms have the capacity to borrow more funds compared to their smaller counterparts (Eriotis, *et al.* 2007: 325). Therefore, as exchange controls are relaxed, large firms take advantage of their credit worthiness to borrow from the domestic banking sector, and even from abroad.

Given these observations, the null hypothesis is rejected in favour of the alternative that exchange control relaxations have a significant impact on leverage for large firms. On the other hand, the null hypothesis cannot be rejected for the book value of the debt to equity ratio.

#### **7.5.4 Results and presentation of hypothesis four**

Hypothesis four is restated as follows:

**$H_0 =$  Domestic financial sector liberalisation has no significant impact on the book and market leverage ratios of all sets of listed firms.**

**$H_a =$  Domestic financial sector liberalisation has a significant impact on the book and market leverage ratios of all sets of listed firms**

- **Regression results for all firms**

Domestic financial sector liberalisation is captured by the lowering of reserve requirements that were effected in the early 1990s. An examination of the correlations reported in Tables 7.6 and 7.7 reveal that the lowering of reserve requirements has no significant impact on leverage of all the firms, except for the book value of the debt to equity ratio. A positive and significant relationship is observed at the 10 percent level of significance. From this, it appears that the lowering of reserve requirements has a mildly significant impact on firm leverage for the full sample. The null hypothesis is therefore, not rejected for the market value ratio of the debt to equity ratio and both measures of the total debt ratio results. The alternative hypothesis is, nevertheless, accepted for the book value of the debt to equity ratio results.

- **Regression results for small firms**

Tables 7.8 and 7.9 show that domestic financial sector liberalisation is associated with an increase in leverage for small firms. The only exception is the market value of the debt to equity ratio which is negatively correlated to the *DFSL* variable. The associated coefficient is mildly significant at the 10 percent level. However, all correlations for the small firm sample are statistically insignificant. The same relationship is observed for the pooled OLS results. The lack of significance in these correlations shows that small firms are not significantly affected by the lowering of reserve requirements. On balance, the null hypothesis cannot be rejected in favour of the alternative that domestic financial sector liberalisation has a significant impact on the book and market value measures of leverage for small firms.

- **Regression results for large firms**

The results reported for large firms are similar to those reported for the firms in the full sample set. The correlations reported in Tables 7.10 and 7.11 reveal that the lowering of reserve requirements has no significant impact on leverage for large firms. The only exception is the relationship between the *DFSL* variable and the book value of the debt

to equity ratio. The coefficient of the *DFSL* variable is statistically significant at the 10 percent level. Overall, it can be inferred that there is mild support for the alternative hypothesis that domestic financial sector liberalisation has a significant impact on large firm leverage. The null hypothesis is, however, accepted that domestic financial sector liberalisation has no significant impact on the market value of the debt to equity ratio and both measures of the total debt ratio.

### **7.5.5 Results and presentation of hypothesis five**

Hypothesis five is restated as follows:

***H<sub>0</sub> = Financial liberalisation has no significant impact on the debt maturity structure of all sets of firms***

***H<sub>a</sub> = Financial liberalisation has a significant impact on the debt maturity structure of all sets of firms***

The results of the debt maturity structure for small firms yield insignificant correlations. This is not surprising because inspection of Figure 7.10 shows that there is no significant shift in the average debt maturity structure of small firms. However, examination of the results generated by the pooled OLS model (which ignores firm specific effects) suggests that the debt maturity structures of small firms respond significantly to the lifting of international sanctions, stock market liberalisation, exchange control relaxations and domestic financial sector liberalisation. On the strength of the fixed and random effects models (which control for firm effects), the null hypothesis is supported that financial liberalisation has no significant impact on the debt maturity structures of small firms.

An examination of the correlations reported for the full sample set and the large firms provides a different picture. For the average firm, stock market liberalisation is associated with a significant reduction in the short term debt ratio. The coefficient is significant at the 10 percent level. For large firms, similar results are observed. Table 7.11 reports that stock market liberalisation is associated with a reduction in the short

term debt ratio. The coefficient is statistically significant at the 5 percent level. This finding suggests that the debt maturity structure of the average firm and large firms increases following stock market liberalisation. Based on these observations, the null hypothesis is rejected in favour of the alternative that stock market liberalisation has a significant impact on the debt maturity structure of both the average firm and large firms.

The coefficients of the *CAL* and *DFSL* dummies are insignificant for the average firm. The null hypothesis is therefore accepted that capital account and domestic financial sector liberalisation have no significant impact on the debt maturity structure of the small, and the average firm. However, the coefficient of the *CAL* variable is positive and significant at the 10 percent level for the set of large firms. From this, it appears that exchange control relaxations reduce the debt maturity structure of large firms, although the effect is mildly supported.

#### **7.5.6 Results and presentation of hypothesis six**

Hypothesis six is restated as follows:

***H<sub>0</sub> = Financial liberalisation has no significant impact on the importance of internal financing.***

***H<sub>a</sub> = Financial liberalisation has a significant impact on the importance of internal financing.***

Figure 7.2 provides an indication that the average retained earnings figures for all the firms increase by a reasonable amount, suggesting that financial liberalisation is associated with higher retentions by domestic firms. However, the correlations for the importance of retained earnings in all the regressions are insignificant. Hence, the results have not been included in the regression output. Accordingly, the null hypothesis cannot be rejected in favour of the alternative that financial liberalisation has a significant impact on retentions for all sets of firms.

### 7.5.7 Results and presentation of hypothesis seven

Hypothesis seven is restated as follows:

**$H_0$  = Stock and banking sector development has no significant impact on book and market value leverage for all sets of firms.**

**$H_a$  = Stock and banking sector development has a significant impact on book and market value leverage for all sets of firms.**

It has been hypothesised that the development of the stock market leads to a substitution of equity for debt, and the size of the banking sector is associated with an increase in the debt ratios for all sets of firms. The general finding from all the regressions is that there is a significant positive correlation between stock market development and leverage and a strong negative association between the size of the banking sector and firm leverage. The possible explanation for the first observation is that stock market development promotes good corporate governance and transparency rules thereby improving the credibility of listed firms. This improved outlook provides creditors with the incentive to lend more money to listed firms (Dermiguc-Kunt & Maksimovic, 1996: 361).

The second observation that banking sector development exerts a negative influence on leverage is surprising. Hence, more empirical work needs to be conducted to assess the underlying impetus behind the inverse correlation between banking sector development and leverage. However, it could be argued that the momentum behind the growth in credit extensions to the private sector shows that firms are capable of taking on more debt. As the signalling theory goes, the market value of equity increases with an issue of debt.

- **Regression results for all firms**

Tables 7.6 and 7.7 reveal consistent significant positive correlations between stock market development and all the measures of leverage. An increase of 1 percent in the stock market development variable leads to a 20.58 and a 6.17 percent increase in the book values of the debt to equity ratio and the total debt ratio respectively. The banking sector development variable is negatively correlated to all the measures of leverage.

The size of the stock market is positively associated with the short term debt ratio of all firms. This relationship indicates that, as the stock market develops, firms increase the maturity structure of their debt. This relationship is statistically significant at the 10 percent level. There are no significant effects of the size of the banking sector on the debt maturity structure of all firms. This lack of significance in this relationship shows that the development of the banking sector does not cause firms to borrow on a longer term basis. This finding is a stark contrast to Galego and Loayza (2000: 28) who observe a positive association between banking sector development and debt maturity structure for Chilean data.

- **Regression results for small firms**

The stock market development variable shown in Tables 7.8 and 7.9 has a positive sign. The coefficient is statistically significant at the 5 percent level for the book value of the debt to equity ratio. The relationship between the size of the banking sector and the book value of the debt to equity ratio is negative but mildly significant at the 10 percent level. Insignificant correlations are found between banking sector development and the book value of the debt to equity ratio and both measures of the total debt ratio.

The impact of stock and banking sector development on the debt maturity structure of small firms is insignificant. The pooled OLS model reports a positive and significant association between stock market development and the book and market value measures of the debt to equity ratio. A similar strong relationship is reported for the book value of the total debt ratio. A negative relationship is revealed for the association between banking sector development and most measures of leverage. The extent of the

significance is strong for the book value of the debt to equity ratio. The only exception is for the market value measures of leverage which are positive and insignificant.

Overall, the null hypothesis is rejected in favour of the alternative that stock and banking sector development has a significant impact on the book value measure of the debt to equity ratio and the book and market value measures of the total debt ratio. These observations are consistent with the arguments postulated by Demirguc-Kunt and Maksimovic (1998: 2107) that differences in capital structures can be attributed to the development of stock markets and banks.

- **Regression results for large firms**

According to Tables 7.10 and 7.11, the stock market development variable is significantly positively associated with the book values of the debt to equity and the book value of the total debt ratios. The coefficients are statistically significant at the 1 percent level. This implies that, as the stock market develops, large firms access more debt relative to equity. Again, this observation is attributable to the increased credibility of firms associated with the stringent transparency and corporate governance rules. Hence, the creditworthiness of large listed firms is enhanced.

A strong and negative relationship is reported between the banking sector development variable and the market value of the debt to equity ratio. The relationship is significant at the 5 percent level. Furthermore, a strong negative coefficient is observed for the book value of the total debt ratio. The associated p-value is significant at the 1 percent level. An insignificant association is seen for the market value of the total debt ratio. Given these observations, the alternative hypothesis is accepted that stock market development has a significant impact on the book value leverage ratios for large firms. The alternative hypothesis is also accepted for the impact of banking sector development on both measures of the debt to equity ratio and the book value of the total debt ratio.

A weak positive relationship is found between stock market development and the debt maturity structure. The associated p-value is statistically significant at the 10 percent level. This means that as the stock market develops, large firms reduce the maturity structure of their debt, though not very significantly. The banking sector development variable is insignificantly related to the debt maturity structure of large firms. Given these observations, the alternative hypothesis is mildly supported for the impact of stock market development on debt maturity structure of large firms, and the null hypothesis cannot be rejected for the impact of banking sector development on the large firm debt maturity structure.

The evidence reviewed thus far indicates that the development of the stock and banking sectors have a significant impact on large firm leverage. However, the debt maturity structure of large firms is mildly affected by the size of the stock and the banking sectors.

#### **7.5.8 Results and presentation of hypothesis eight**

Hypothesis eight is restated as follows:

**$H_o =$  *There is no significant structural shift in the regression parameters for the period of analysis***

**$H_a =$  *There is a significant structural shift in the regression parameters for the period of analysis***

The null hypothesis established in chapter four is based on the equality of coefficients across the two regimes. The dummy variable estimation technique has been used to test for structural shifts in each of the regression parameters.

Table 7.12 shows the results of the impact of various aspects of financial liberalisation on the stability of firm specific determinants of the debt to equity ratio. The output shows that financial liberalisation, particularly the lifting of international sanctions and stock



market liberalisation, have a significant impact on the stability of the firm profitability parameter. The coefficients for both measures are significant at the 1 percent level. This result shows that the lifting of international sanctions causes profitability to increase the book value of the debt to equity ratio and to reduce the market value of the debt to equity ratio. Stock market liberalisation causes the profitability variable to reduce the book value of the debt to equity ratio and to increase the market value of the debt to equity ratio.

Exchange control relaxations have a mild effect on the stability of the profitability coefficient for the book value of the debt to equity regression. The growth parameters are also affected by stock market liberalisation and exchange control relaxations. The effect is more pronounced for the exchange control relaxation dummy. The interaction between the exchange control relaxation dummy and growth has a significant positive impact on the book value of the debt to equity ratio. The associated p-value is statistically significant at the 1 percent level. It can thus be concluded that the growth variable changes significantly with stock market liberalisation and exchange control relaxations. This relationship is only significant for the book value of the debt to equity ratio regression.

Stock market liberalisation affects the stability of the non-debt tax shield parameter. The coefficient of the interaction is significant at the 5 percent level. The lifting of international sanctions has a mild effect on the stability of the non-debt tax shield coefficient for the market value of the debt to equity regression. This relationship is significant at the 10 percent level. Nonetheless, for the book value relationship, the tax variables seem to be significantly affected by the lifting of international sanctions and stock market liberalisation. The relationship is significant at the 1 percent level.

In conclusion, there is strong evidence that the lifting of international sanctions and stock market liberalisation have a significant impact on the stability of the regression parameters. Particularly, profitability, growth and taxes are the most affected. There is mild support for the impact of stock market liberalisation on the stability of the non-debt tax shield variables. Overall, the null hypothesis is rejected in favour of the alternative

that the regression coefficients are affected significantly by financial liberalisation. Predominantly, the profitability coefficients in the book and market value of the debt to equity ratio relationship are the most affected.

**Table 7.12 Interactive dummy regression outputs for the debt to equity ratios**

Variable	TD/E(B)		TD/E(M)	
	Coefficient	P-value	Coefficient	P-value
LIS*Profitability	1.732234	0.0000***	-2.366159	0.0066***
SML* Profitability	-1.803100	0.0000***	3.079457	0.0000***
CAL* Profitability	-0.504395	0.0391**	-0.395767	0.2656
DFSL* Profitability	0.147730	0.7985	-0.886476	0.5201
LIS*Growth	-0.006361	0.7416	-0.066874	0.0650*
SML*Growth	-0.035193	0.0798*	0.018390	0.5269
CAL*Growth	0.062777	0.0001***	0.016561	0.4065
DFSL*Growth	-0.003060	0.9178	0.041193	0.4192
LIS*Tangibility	-0.223743	0.3699	-0.611268	0.1623
SML* Tangibility	-0.235481	0.1987	0.226831	0.4123
CAL* Tangibility	0.121860	0.4245	0.244573	0.2750
DFSL* Tangibility	0.592699	0.1209	0.509160	0.4481
LIS*Ndts	-0.260575	0.9018	10.38302	0.0553*
SML* Ndts	4.641944	0.0163**	-7.581566	0.0336*
CAL* Ndts	-2.097623	0.1129	-1.310293	0.5697
DFSL* Ndts	-3.798348	0.2251	-6.012290	0.4720
LIS*Tax	-0.356939	0.0082***	0.213693	0.5121
SML* Tax	0.256402	0.0062***	-0.143685	0.4626
CAL* Tax	0.034604	0.4288	0.083250	0.3414
DFSL* Tax	0.125458	0.5253	-0.338794	0.5392
LIS*Dividends	-0.183876	0.1481	0.102625	0.7076
SML* Dividends	0.056614	0.1333	-0.049338	0.5062
CAL* Dividends	-0.010997	0.6191	-0.023305	0.7117
DFSL* Dividends	0.247384	0.3087	-0.085803	0.8706
LIS*Size	5.53E-05	0.9990	-0.049393	0.6523
DUM_95* Size	-0.033787	0.3696	0.129742	0.1303
CAL* Size	0.046523	0.1821	0.018546	0.7883
DFSL* Size	0.004217	0.9519	0.060690	0.7072
Adjusted R-squared	<b>0.535083</b>		<b>0.510110</b>	
S.E. of regression	<b>0.485307</b>		<b>1.460137</b>	
F-statistic	<b>37.19651</b>		<b>33.74811</b>	
Prob(F-statistic)	<b>0.000000</b>		<b>0.000000</b>	
Durbin-Watson stat	<b>2.188057</b>		<b>2.111824</b>	

Notes: This table reports panel least squares regression results for the interaction between financial liberalisation dummies and firm specific determinants of capital structure. The dependent variables are TD/E (Book) and TD/E (Market). Only interactive results are reported. \*, \*\*, \*\*\* indicate levels of significance at the 10%, 5% and 1% respectively.

Table 7.13 shows the results of the impact of various aspects of financial liberalisation on firm specific determinants of the book and market values of the total debt ratio and

the short term debt ratio. It appears that the lifting of international sanctions has no significant impact on the stability of the profitability variables. However, stock market liberalisation causes a structural break in the profitability parameter. The relationship is significant at the 5 and 1 percent levels for the book and market value ratio regressions respectively. The effect of the firm growth prospects on the book and market value ratios does not change significantly with time. However, the stability of the asset tangibility variable breaks with the lifting of international sanctions and domestic financial sector liberalisation. The interaction coefficient is statistically significant at the 5 percent level for both regressions.

The tax variable is not stable with the interaction of stock market liberalisation. The coefficient for the interaction variable is statistically significant at the 5 percent level for only the market value ratio regression. Exchange control relaxations cause a significant structural break in the tax variable. The relationship is statistically significant at the 1 percent level for the market value regression. Domestic financial sector liberalisation has mild effects on the stability of the dividend payout parameter. This moderate effect is indicated by the p-value of 0.09. The stability of the size variable is affected significantly by exchange control relaxations. The associated coefficient is significant at the 5 percent level.

In terms of the debt maturity structure, the stability of the profitability coefficients is affected with stock market liberalisation. The change is significant at the 1 percent level. In addition, there is mild support that exchange control relaxations affect the profitability and non-debt tax shield parameters. Stock market liberalisation and exchange control relaxations affect the stability of the tangibility and size estimates. The associated coefficient is significant at the 5 percent level.

In sum, it appears that the stability of the profitability, tangibility and tax variables is affected significantly by financial liberalisation, particularly stock market, capital account and domestic financial sector liberalisation. There is no evidence to suggest that the impact of growth on the total debt ratio changes significantly over the period of financial liberalisation. In terms of the short term debt regression, the most prominent

observation is that the profitability estimate changes significantly with stock market liberalisation. Overall, the null hypothesis is rejected in favour of the alternative that regression parameters are not stable over the period of analysis.

**Table 7.13 Interactive dummy regression outputs for the total debt and short term debt ratio**

Variable	TD/TA(B)		TD/TA(M)		STD/TA	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
LIS*Profitability	0.022458	0.8503	-0.030650	0.7976	-0.157577	0.1213
SML* Profitability	0.209886	0.0358**	0.307054	0.0033***	0.402314	0.0000***
CAL* Profitability	-0.108544	0.1393	-0.170394	0.0191**	-0.093754	0.0802*
DFSL* Profitability	-0.094510	0.5446	-0.046287	0.7730	-0.090558	0.5117
LIS*Growth	-0.001394	0.7286	-0.005217	0.2095	-0.000898	0.8505
SML*Growth	-0.003346	0.5054	-0.001319	0.7920	0.001513	0.7227
CAL*Growth	0.002068	0.5883	0.003147	0.3976	-0.001343	0.6595
DFSL*Growth	0.005538	0.3588	0.005990	0.3155	-0.000628	0.9317
LIS*Tangibility	-0.147181	0.0249**	-0.174406	0.0228**	-0.022049	0.6429
SML* Tangibility	0.026429	0.5926	0.024422	0.6659	0.064832	0.0498**
CAL* Tangibility	-0.010322	0.8200	-0.066845	0.1922	-0.016631	0.5573
DFSL* Tangibility	0.226763	0.0188**	0.349018	0.0024***	0.039148	0.6081
LIS*Ndts	0.235909	0.6758	0.363889	0.5936	-0.405290	0.3577
SML* Ndts	0.252245	0.6267	0.228310	0.6824	0.033619	0.9194
CAL* Ndts	-0.252552	0.5108	-0.209186	0.6176	-0.431047	0.0641*
DFSL* Ndts	-0.767371	0.3354	-1.206677	0.2408	-0.044415	0.9488
LIS*Tax	-0.028618	0.4560	-0.066355	0.1652	0.027283	0.3194
SML* Tax	-0.018951	0.4848	-0.075455	0.0246**	-0.018968	0.3537
CAL* Tax	0.014119	0.2703	0.069021	0.0000***	0.006384	0.5031
DFSL* Tax	0.068591	0.2389	0.088524	0.2521	-0.021947	0.5755
LIS*Dividends	0.051342	0.1205	0.077342	0.0759	0.002911	0.9128
SML* Dividends	-0.009236	0.4016	-0.007477	0.4994	-0.002194	0.7734
CAL* Dividends	0.005825	0.4756	0.007301	0.4053	0.003706	0.4661
DFSL* Dividends	-0.108090	0.0889*	-0.157053	0.0580*	-0.016079	0.7521
LIS*Size	0.000208	0.9877	0.002538	0.8763	-0.012308	0.2525
DUM_95* Size	-0.003092	0.7880	-0.000703	0.9582	0.001258	0.8847
CAL* Size	0.028763	0.0142**	0.019945	0.1433	0.019669	0.0143**
DFSL* Size	0.016816	0.3461	-0.004948	0.8281	0.023162	0.1386
Adjusted R-squared	<b>0.771457</b>		<b>0.703376</b>		<b>0.536124</b>	
S.E. of regression	<b>0.080003</b>		<b>0.106998</b>		<b>0.066923</b>	
F-statistic	<b>107.1606</b>		<b>75.57640</b>		<b>37.34826</b>	
Prob(F-statistic)	<b>0.000000</b>		<b>0.000000</b>		<b>0.000000</b>	
Durbin-Watson stat	<b>2.091209</b>		<b>2.197382</b>		<b>2.157117</b>	

Notes: This table reports panel least squares regression results for the interaction between financial liberalisation dummies and firm specific determinants of capital structure. The dependent variables are TD/TA (Book) and TD/TA (Market). Only interactive results are reported. \*, \*\*, \*\*\* indicate levels of significance at the 10%, 5% and 1% levels respectively.

### 7.5.9 Robustness checks

The results estimated by the static model could be biased due to the possibility of endogeneity in the explanatory variables. Endogeneity occurs when the explanatory variables are correlated with the error term. This correlation may occur as a result of the following: reverse causation in the regression equation, omitted variables or some measurement error. Ozkan (2001: 186) demonstrates that the shocks affecting firm financing behaviour may also likely affect the market value of equity. The subsequent change in the market value of equity could affect some regressors such as the market to book value of equity. Schumkler and Vesperoni (2006: 200) advise that regressors with cross-firm variation may also cause endogeneity, because the macro variables are likely to be exogenous in the firm level analysis.

To resolve this potential problem, the instrumental variable technique is used to control for endogeneity biases in the reported results. The lagged explanatory variables are used for control and continuous variables. The object here is to use variables that are uncorrelated with their contemporaneous error terms and at the same time, correlated with their contemporaneous values. An examination of the instrumental variable regression results reported in Table 7.14 indicates that the previous results reported in section 7.3.1 are robust to the endogeneity problem. Bekaert *et al.* (2005: 3), Mitton (2006: 642), Schumkler and Vesperoni (2006: 200) and Flavin and O'Connor (2010: 202) control for potential endogeneity in their analyses. They all conclude that controlling for endogeneity does not affect the causal relationships in their estimations. These observations provide a reasonable basis to conclude that the results estimated using fixed and random effects models, are robust to the endogeneity problem.

Specifically, individual firm access to international equity markets is an insignificant determinant of firm leverage. International sanctions have a negative impact on firm leverage. Stock market liberalisation reduces all the measures of leverage and increases the debt maturity structure of firms. Exchange control relaxations are associated with higher leverage and the impact of domestic financial sector liberalisation on firm leverage is mildly supported. The development of the stock market

causes firms to access more debt, and the size of the banking sector is inversely related to all measures of leverage.

It has been argued that the fixed (within) effects and random effects GLS estimators may be inconsistent and biased in a dynamic panel data model (Antoniou, *et al.* 2006: 175), particularly where  $N$  is large and  $T$  is fixed. Furthermore, the instrumental variable technique does not take into account all the available moment conditions. Given these arguments, the Arellano and Bond (1991: 277) two-step GMM procedure is used to resolve this problem. The two-step procedure is more efficient than the one-step estimation model especially when heteroscedasticity is present in a large panel spanning over a long period of time. The Sargan test of overidentifying restrictions is satisfied. Tests for lack of first order autocorrelation are not satisfied because transformation induces first order serial correlation in the first differenced residuals. This presence of first order autocorrelation is expected. However, tests for lack of second order autocorrelation are satisfied for all the measures of leverage.

The results are reported in Table 7.15. It appears that the correlations reported by the dynamic model are similar to those generated by the fixed (within) effects GLS, random effects GLS and the instrumental variable estimations. However, the GMM estimation technique produces stronger correlations, which are mostly significant at all conventional levels. Again, it is observed that the lifting of international sanctions and stock market liberalisation are associated with a reduction in leverage. Capital account liberalisation causes firms to access more debt and there is mild support for domestic financial sector liberalisation. Stock market liberalisation provides avenues for firms to increase their debt maturity structure. The size of the stock market is positively associated with leverage and banking sector development is negatively correlated to leverage. From these analyses, it can be concluded that stronger estimation techniques confirm the correlations reported by the static panel and instrumental variable techniques<sup>35</sup>.

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<sup>35</sup> To save on space, only instrumental variable and GMM estimates are reported for the full sample set. The results for the small and large firms are estimated separately and similar correlations are observed.

**Table 7.14: Instrumental variable results**

Variables	TDE (Book)		TDE (Market)		TDTA (Book)		TDTA (Market)		STDTA	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
<b>Growth</b>	0.0059	0.4530	-0.0874***	0.0000	0.0018	0.5510	-0.0270***	0.0000	0.0008	0.7630
<b>Tangibility</b>	0.3164***	0.0000	0.1643**	0.0230	0.1995***	0.0000	0.1519***	0.0000	-0.0203	0.3570
<b>Profitability</b>	-0.6078***	0.0000	-0.6388***	0.0000	-0.2370***	0.0000	-0.2125***	0.0000	-0.0886**	0.0270
<b>Size</b>	-0.0282	0.2460	-0.0346	0.1620	-0.0053	0.6060	-0.0121	0.2960	-0.0303***	0.0000
<b>IFF</b>	0.0128	0.8270	0.0026	0.9650	-0.0014	0.9570	-0.0132	0.6310	0.0218	0.1880
<b>LIS</b>	-0.0543	0.2150	-0.0385	0.4070	-0.0237	0.1580	-0.0297	0.1690	0.0074	0.6250
<b>SML</b>	-0.0612	0.1890	-0.1290***	0.0090	-0.0276	0.1220	-0.0504**	0.0280	-0.0373**	0.0200
<b>CAL</b>	0.2139**	0.0220	0.2969***	0.0030	0.0785**	0.0290	0.0720	0.1190	0.0655**	0.0420
<b>DFSL</b>	0.0061	0.9220	-0.0030	0.9640	0.0060	0.8000	-0.0087	0.7760	-0.0494**	0.0210
<b>SMCGDP</b>	0.2009***	0.0060	0.1558**	0.0460	0.0613**	0.0300	0.0614*	0.0920	0.0372	0.1430
<b>DCGDP</b>	-1.4203	0.0020	-1.2686***	0.0090	-0.4682***	0.0080	-0.2200	0.3320	-0.0703	0.6570
<b>Constant</b>	0.7249***	0.0000	0.9339***	0.0000	0.2431***	0.0000	0.3044***	0.0000	0.2995***	0.0000
<b>R-Squared</b>	0.10		0.25		0.13		0.16		0.14	
<b>Wald chi2(11)</b>	57.04		43.86		18.06		142.76		43.23	
<b>Prob &gt; chi2</b>	0.0000		0.0000		0.0000		0.0000		0.0000	
<b>No. of Observations</b>	912		912		912		912		912	

Notes: This table reports instrumental variable results for the impact of financial liberalisation on capital structure. The instruments used are lagged values of the explanatory variables. The variables are as defined in the notes to Table 7.6. Standard errors are robust to heteroscedasticity. \*\*\*, \*\*, \* indicate the levels of significance at the 1%, 5% and 10% levels respectively.

**Table 7.15: Arellano-Bond two-step GMM results**

Variables	TDE (Book)		TDE (Market)		TDTA (Book)		TDTA (Market)		STDTA	
	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value	Coefficient	P-value
Lagged -1 (Dep Var)	0.50306***	0.0000	0.46767***	0.0000	0.58584***	0.0000	0.30115***	0.0000	0.39241***	0.0000
Growth	0.00533	0.3110	-0.05909***	0.0000	0.00571**	0.0170	-0.02232***	0.0000	-0.00160	0.2230
Tangibility	0.29046***	0.0010	0.32786***	0.0000	0.15771***	0.0000	0.14479***	0.0000	-0.07209***	0.0040
Profitability	-0.41802***	0.0000	-0.56727***	0.0000	-0.24233***	0.0000	-0.18578***	0.0000	-0.02479	0.1750
Size	0.27427***	0.0000	0.33572***	0.0000	0.12894***	0.0000	0.10893***	0.0000	0.04918***	0.0020
LIS	-0.03565**	0.0270	-0.01586	0.3500	-0.00083	0.9010	-0.00631	0.3810	0.01226**	0.0230
SML	-0.08927***	0.0000	-0.13017***	0.0000	-0.04353***	0.0000	-0.05946***	0.0000	-0.03959***	0.0000
CAL	0.22624	0.0000	0.28529***	0.0000	0.09766***	0.0000	0.09335***	0.0000	0.04243***	0.0000
DFSL	-0.01177	0.6090	-0.04247*	0.0930	-0.01505	0.1410	-0.04514***	0.0000	-0.04569***	0.0000
SMCGDP	0.16517***	0.0000	0.03387	0.2800	0.01544	0.1820	0.01320	0.3100	0.03394***	0.0000
DCGDP	-0.11602***	0.0000	-0.09002***	0.0000	-0.03677***	0.0000	-0.01413**	0.0280	-0.00167	0.7020
Constant	-1.22997***	0.0000	-1.43638***	0.0000	-0.59685***	0.0000	-0.42841***	0.0000	-0.19704**	0.0160
Wald (Joint)	0.0000		0.0000		0.0000		0.0000		0.0000	
Sargan	49.32		62.97		43.99		64.21		56.75	
Prob > chi2	0.4201		0.720		0.6376		0.1011		0.1811	
Correlation 1	0.0004		0.0003		0.0000		0.0390		0.0337	
Correlation 2	0.1547		0.1468		0.170		0.1565		0.4766	
No. of Observations	801		801		801		801		801	

Notes: This table reports Arellano-Bond two-step GMM results for the impact of financial liberalisation on capital structure. Results are robust to panel-specific heteroscedasticity and autocorrelation. The variables are as defined in the notes to Table 7.6 \*\*\*, \*\*, \* indicate the levels of significance at the 1%, 5% and 10% levels respectively.



### **7.5.10 Summary of the effects of financial liberalisation on capital structure**

The empirical analysis of the contrasting effects of financial liberalisation on firm capital structures has revealed several important facts. The main findings indicate that stock market liberalisation has a significant negative impact on both the book and market value measures of leverage for all firms. The impact is more pronounced for larger firms.

International sanctions are associated with a significant reduction in both the book and market value measures of leverage for all sets of firms. The impact is more pronounced for larger firms. Exchange control relaxations are associated with an increase in both the book and market value measures of leverage. The impact is more pronounced for large firms.

There is moderate support for the effects of domestic financial sector liberalisation on firm leverage. The significant correlations observed suggest that the lowering of reserve requirements is associated with an increase in leverage. Stock market development causes all sets of firms to increase both of the measures of leverage and the size of the banking sector is surprisingly negatively associated with both the book and market value measures of leverage.

Firm access to international equity markets has no significant impact on the choice of capital structure. Stock market liberalisation is associated with an increase in the maturity structure of debt for all sets of firms. The importance of retained earnings is not significantly affected by all variables capturing financial liberalisation.

The next section employs the Difference and System GMM models to examine two aspects of the dynamics of firm leverage. Firstly, firm specific determinants of capital structure are analysed. Secondly, the results of the long run target adjustment model are assessed for two dynamically different periods.

## 7.6 FIRM SPECIFIC DETERMINANTS OF LEVERAGE

This section discusses the seven determinants of leverage and their correlations with firm leverage for the periods prior to and after financial liberalisation.

To assess the determinants of capital structure in two dramatically different regimes, the sample is split into two distinct time periods (pre liberalisation, and post liberalisation). GMM estimates are used to model the partial adjustment process of firms operating pre and post financial liberalisation. In the process, the potential determinants of capital structure are determined in tandem with the nature of adjustment. Firm specific effects are controlled for by estimating the model in first differences and estimating level and differenced equations simultaneously using the System GMM estimation technique.

### 7.6.1 Results for the dynamic panel data specification tests

The Wald test for joint significance for all regressions is satisfied at the 1 percent level of significance. The Wald test for the significance of the time effects is significant for all post liberalisation results. The time specific effects for the pre liberalisation period are mostly insignificant. The significance of the time dummies for the post liberalisation period suggests that aggregate factors have a significant influence on firm financing behaviour.

The Sargan test of overidentifying restrictions is valid for all regressions with the exception of the pre liberalisation results for the market value debt to equity ratio. The associated p-value is 0.0146 and 0.0073 for the Difference and System GMM models respectively. This suggests that the instruments used for the lagged variables are invalid. The tests for lack of first order serial correlation are not satisfied for the post liberalisation market debt to equity ratio regression, the total debt regressions and the short term debt ratio regression. This is expected because according to Ozkan (2001: 196) transformation induces first order serial correlation in the first differenced residuals. The GMM estimators are consistent based on the assumption that  $E(\mu_{i,t}, \mu_{i,t-2})$  are uncorrelated, hence second order serial correlation should not be

present. As demonstrated in Arellano and Bond (1991: 279), the efficiency of the GMM estimation technique relies heavily on the absence of second order correlation. Second order correlation is absent in all the reported results, suggesting that the models used are correctly specified.

Given these observations, it may not be appropriate to report on the effects of firm specific characteristics on the market value of the debt to equity ratio for the pre liberalisation period. Nevertheless, all the other results are valid and the target adjustment model of capital structure can thus be interpreted accordingly.

### **7.6.2 The book value of the debt to equity ratio (pre and post liberalisation)**

Table 7.17 reports the GMM estimates for capital structure determinants for the book value of the debt to equity ratio. The results are presented for the pre and post liberalisation periods.

**Table 7.17: GMM estimates of target capital structure (Book debt to equity)**

Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM Coefficient	SYS GMM Coefficient	DIFF GMM Coefficient	SYS GMM Coefficient
$TD/E(B)_{i,t-1}$	0.4509***	0.6096***	0.14765***	0.1343***
Growth	0.0049	0.0251	0.17456***	0.2079***
Tangibility	0.2134	0.5360	1.62173***	1.3956***
Ndts	-3.6717***	-4.2821*	-2.90957***	-2.8801***
Profitability	1.4052***	1.6005***	0.37083***	0.6054***
Size	0.7831***	0.6595***	0.75315***	0.7396***
Taxes	0.0525***	0.0168	0.05324***	0.0602***
Dividends	5.65E-07	-0.0234**	0.01781***	0.0194***
<b>Wald (Joint)</b>				
Prob>chi2	0.0000	0.0000	0.0000	0.0000
Wald (Dummy)	0.3710	0.8790	0.0000	0.0000
Sargan				
Prob>chi2	0.4018	0.8175	0.75	0.2827
Correlation 1	0.3995	0.3881	0.1029	0.0898
Correlation 2	0.1809	0.1929	0.1146	0.1006

Notes: This table reports the two-step Arellano-Bond/Bover dynamic panel results for the book value measures of total debt to equity ratio. Results are robust to panel-specific heteroscedasticity and autocorrelation. Results including the lagged coefficients are reported for the pre and post liberalisation periods. \*, \*\*, \*\*\* indicate significance levels at the 10%, 5% and 1% respectively.

- **Pre liberalisation results**

### ***Non-debt tax shields***

The coefficient for the non-debt tax shield variable is negative and significant at the 10 percent level for the pre liberalisation regime. This observation is in line with the prediction of DeAngelo and Masulis (1980: 3) that firms with higher non-debt tax shields are less likely to borrow more. These results confirm the findings of Bennet and Donnelly (1993: 54) for firms in the United Kingdom, De Miguel and Pindado (2001: 77) for firms in Spain and Ngugi (2008: 620) for firms in Kenya.

### ***Profitability***

Contrary to the prediction of Myers and Majluf (1984: 188), a positive and significant association between profitability and the book value of the debt to equity is observed for

both periods. This finding confirms the predictions of the trade-off and the agency cost theory. The trade-off theory posits that more profitable firms will accumulate more debt to take advantage of the interest tax shields. This observation is expected because firms in the pre liberalisation period were subject to higher effective tax rates than firms in the post liberalisation period. The agency cost theory hypothesises that more profitable firms will borrow more to force managers to disgorge cash to bondholders.

### ***Size***

The coefficient of the size variable is statistically significant at the 1 percent level. This finding shows that the firms operating in the pre liberalisation regime used asset structure as collateral for access to debt. Mutenheri and Green (2003: 166) also document a positive correlation for the size variable for the Zimbabwean pre-reform period. However, their coefficient of the size variable is statistically insignificant.

### ***Dividend payout***

The dividend payout ratio is negatively correlated to the book value of the debt to equity ratio. The coefficient is mildly significant at the 10 percent level. This suggests that an increase in the payout ratio is an indication that firms have generated enough earnings to finance growth. Therefore, there may be no need to borrow more.

- **Post liberalisation results**

### ***Growth***

The growth variable is directly correlated to the book value of the debt to equity ratio. The coefficient is statistically significant at all conventional levels. This observation lends support to the theory that firms with high growth prospects have an added value advantage and hence this increases the firms' debt capacity. This relationship supports

the findings of Gupta (1969: 520), Titman and Wessels (1988: 4) and Abor and Biekpe (2005: 44), among others.

### ***Asset tangibility***

Asset tangibility exerts a positive influence on the book value of the debt to equity ratio. The associated coefficient is statistically significant at the 1 percent level. This result is not surprising given that a high proportion of fixed assets serves as collateral for further access to debt (Rajan & Zingales: 1995: 1451).

### ***Non-debt tax shields***

Non-debt tax shields are negatively correlated to firm leverage. The coefficient of the non-debt tax shield variable is statistically significant at the 1 percent level. This result confirms DeAngelo and Masulis' (1980: 3) prediction that firms with more non-debt tax shields have less incentive to accumulate more debt.

### ***Profitability***

The profitability coefficient is positively associated with leverage. This result supports the trade-off theory, which hypothesises that profitable firms accumulate more debt to take advantage of the interest tax shields associated with debt. The positive association also supports the agency cost hypothesis that profitable firms will borrow more to mitigate the conflicts of interest associated with the high levels of free cash flow. Consequently, managers are forced to disgorge cash to bondholders in the form of interest payments. There are not many studies that confirm this prediction. For example, Gwatidzo and Ojah (2009: 1) perform an extensive analysis of firm determinants of capital structure for firms in five African countries. The only positive correlation uncovered in their study is for Nigerian firms.

## **Size**

The size coefficient is positive and significant at the 1 percent level. This observation is consistent with two theories. Firstly, large firms have lower information asymmetries and hence are capable of issuing information sensitive securities such as equity with relative ease. Secondly, large firms have a better capacity to assume more debt than smaller firms. This result corroborates the finding by Gwatidzo and Ojah (2009: 10) who use the same proxy for size as used in this study.

## **Taxes**

Corporate taxes are positively related to leverage. The coefficient of the tax variable is positive and significant at the 1 percent level. The trade-off theory prediction that the tax deductibility of interest will induce firms to borrow more is safely confirmed by the data for the post liberalisation period. This means that firms operating in such an environment could have shielded their profits from higher taxes through the accumulation of more debt. This finding corroborates well with the prediction posited by Modigliani and Miller (1963: 433), and the evidence documented by Graham (2001: 41) that taxes are directly related to leverage.

## **Dividend payout**

The coefficient of the dividend payout variable is positive and significant at the 1 percent level. This observation could be due to the following two reasons; Firstly, large dividend payments reduce firms' free cash flows thereby reducing the funds available for investment projects. This forces corporate managers to seek additional finance from the capital markets. This conjecture is consistent with Jensen's (1986: 323) free cash flow hypothesis. Secondly, many listed firms use dividends as a credible signal that the prospects for their future earnings are sound. This signalling incentive provides avenues for dividend paying firms to seek further borrowing from the capital markets.

### 7.6.3 The market value of the debt to equity ratio (pre and post liberalisation)

Table 7.18 reports the GMM estimates for the capital structure determinants of the market value of the debt to equity ratio. The results are shown for the pre and post liberalisation periods.

**Table 7.18: GMM estimates of target capital structure (Market debt to equity)**  
**Arellano-Bond/Bover dynamic panel estimation (Two-step results)**

Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM Coefficient	SYS GMM Coefficient	DIFF GMM Coefficient	SYS GMM Coefficient
TD/E(M) <sub>i,t-1</sub>	-0.0108***	-0.0159***	0.2777***	0.2739***
Growth	-0.0485	-0.0616	-0.0191***	-0.0600***
Tangibility	-1.1238	-1.0191*	2.5327***	2.2671***
Ndts	30.5210***	14.9813***	-3.8978***	-10.4066***
Profitability	-2.5456***	-2.9629***	-2.3996***	-2.6728***
Size	-0.8125**	-0.8654***	1.0861***	-0.1825***
Taxes	-0.2095***	-0.0896	-0.0702***	-0.0192***
Dividends	0.0684	0.0786**	-0.0117***	-0.0390***
<b>Wald (Joint)</b>				
Prob>chi2	0.0000	0.0000	0.0000	0.0000
<b>Wald (Dummy)</b>	0.0280	0.0000	0.0000	0.0000
<b>Sargan</b>				
Prob>chi2	0.0146	0.0073	0.6099	0.2527
<b>Correlation 1</b>	0.8188	0.8141	0.0730	0.0702
<b>Correlation 2</b>	0.1889	0.1391	0.5063	0.1292

Notes: This table reports the two-step Arellano-Bond/Bover dynamic panel results for the market value measures of the total debt to equity ratio. The results are robust to panel specific heteroscedasticity and autocorrelation. The results are reported for the pre and post liberalisation periods. \*, \*\*, \*\*\* indicate significance levels at the 10%, 5% and 1% respectively.

As reported earlier, the Sargan test of overidentifying restrictions for both the Difference and System GMM estimation techniques is not satisfied. This is evident for the market value of the debt to equity ratio for the pre liberalisation period. As a result it may not be appropriate to report on the results for the pre liberalisation period shown in Table 7.18. However, the expected signs for the determinants of capital structure for the pre liberalisation period appear to confirm the predictions of the capital structure theories. Because of this violation, only the post liberalisation period is analysed for the market value of the debt to equity ratio.



- **Post liberalisation results**

### ***Growth***

The growth prospects for firms operating in the post liberalisation period are negatively related to the market value of the debt to equity ratio. The correlation coefficient is significant at the 1 percent level. This result confirms the predictions made by Myers (1977: 150) that growth firms will generally avoid debt to avoid the potential future under investment problem. These results corroborate favourably with Barclay and Smith (1996: 210), Frank and Goyal (2009: 15) and Ovtchinnikov (2010: 249).

### ***Asset tangibility***

The asset tangibility variable is significantly positively correlated with the market debt to equity ratio. This means that firms in the post liberalisation regime use their fixed assets as collateral to acquire loans. This result is consistent with Jensen and Meckling's (1976: 305) argument that the agency costs of debt can be mitigated if the collateral value of assets is high. Hence, a large proportion of tangible assets is likely to be associated with high levels of leverage. Huang and Song (2006: 30) document a similar correlation for Chinese listed firms and Gwatidzo and Ojah (2009: 15) observe a comparable relationship for firms in Nigeria and South Africa.

### ***Non-debt tax shields***

The non-debt tax shield variable is significantly negatively correlated to leverage at the 1 percent level. This revelation confirms Negash's (2002: 26) observation that taxes are inversely correlated to leverage for South African firms. Frank and Goyal (2009: 15) also document a negative association for the book values of leverage. The result of the dynamic model contrasts with the static model utilised by Gwatidzo and Ojah (2009: 13) who document insignificant correlations for firms in South Africa.

### ***Profitability***

The coefficient of the profitability variable is negative and significant at the 1 percent level. The pecking order hypothesis is confirmed by the dynamic model for the market leverage. This observation corroborates the results of the static panel data models of Mutenheri and Green (2003: 166), Abor and Biekpe (2005: 44) and Gwatidzo and Ojah (2009: 9). The dynamic models of capital structure employed by Ozkan (2001: 187) and Ngugi (2008: 620) also confirm an inverse relationship between firm profitability and leverage.

### ***Size***

The size coefficient is positive and significant at the 1 percent level. This positive association lends support to the theory that larger firms can negotiate for loans on more favourable terms. This enables them to take on more debt at lower interest rates. Furthermore, Eriotis *et al.* (2007: 325) reason that larger firms are less risky than smaller firms, hence banks are willing to loan them more funds. This lowers their probability of default. These results are consistent with the findings of Booth *et al.* (2001) for a sample of firms in emerging markets, Deesomsak *et al.* (2004: 399) for firms in the Asia Pacific region and Huang and Song (2006: 28) for firms in China.

### ***Taxes***

An inverse association is observed between the tax variable and the market debt to equity ratio. This indirect association confirms the findings of Negash (2002: 26). Ngugi (2008: 620) uses the same measure of tax paid to this study and finds negative and insignificant results for Kenya.

### ***Dividend payout***

The dividend payout coefficient is negative and significant at all conventional levels. This observed relationship confirms the credibility of the signals conveyed by dividend

paying firms. A payment of dividend increases the market value of firms thereby reducing leverage. This observation is consistent with the dividend signalling theory, which suggests that dividend increases are associated with managements' confidence about the stability of future cash flows. All things being equal, the market value of equity should increase and, consequently, the market value of the debt to equity ratio should decrease.

#### **7.6.4 The book value of total debt ratio (pre and post liberalisation)**

Table 7.19 reports the GMM estimates for the capital structure determinants of the book value of the total debt ratio. The results are shown for the pre and post liberalisation periods.

**Table 7.19: GMM estimates of target capital structure (Book total debt ratio)**  
**Arellano-Bond/Bover dynamic panel estimation (Two-step results)**

Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM Coefficient	SYS GMM Coefficient	DIFF GMM Coefficient	SYS GMM Coefficient
TD/TA(B) <sub>i,t-1</sub>	0.71915***	0.7434***	0.4441***	0.5350***
Growth	0.00332**	0.0068*	0.0062***	0.0067***
Tangibility	0.14824*	0.0084	0.4205	0.3574***
Ndts	-1.20415**	-1.1840**	-0.2373	-0.6486
Profitability	-0.21671***	-0.2570***	-0.1411***	-0.1688***
Size	0.02039	0.0221*	0.1633***	0.0113**
Taxes	0.01331***	0.0079	-0.0033***	-0.0064*
Dividends	0.00354	0.0048	-0.0047***	-0.0040*
<b>Wald (Joint)</b>				
Prob>chi2	0.0000	0.0000	0.0000	0.0000
Wald (Dummy)	0.1080	0.1630	0.0000	0.0000
<b>Sargan</b>				
Prob>chi2	0.8300	0.1203	0.9500	0.5664
Correlation 1	0.0038	0.0029	0.0001	0.0001
Correlation 2	0.7014	0.5142	0.2256	0.1109
No. of observations	280	350	688	768

Notes: This table reports the two-step Arellano-Bond/Bover dynamic panel results for the book value measures of the total debt ratio. Results including the lagged coefficients are reported for the pre and post liberalisation periods. \*, \*\*, \*\*\* indicate significance levels at the 10%, 5% and 1% respectively.

- **Pre liberalisation results**

***Growth, Non-debt tax shields, Profitability and Size***

The growth variable is positively correlated to the book value of the total debt ratio. However, the correlation is mildly significant at the 10 percent level. This relationship suggests that high growth firms operating in the pre liberalised regime accumulated more debt to finance their growth prospects. Al Najjar (2011: 12) uses the same proxy for growth as the one used in this study and finds a similar correlation for Jordanian firms. The non-debt tax shield variable is negatively correlated to the book value of total debt, again confirming the predictions of DeAngelo and Masulis (1980: 3). The negative association depicted between profitability and the book value of the total debt ratio confirms the pecking order hypothesis for the pre liberalisation regime. The associated coefficient is significant at the 1 percent level. The negative relationship is similar to the findings of Chang *et al.* (2009: 209) for firms in the Compustat Industrial Files and

Gwatidzo and Ojah (2009: 9) for firms in South Africa and Ghana. Size is positively correlated to the book value of the total debt ratio, but the correlation is mildly significant at the 10 percent level.

- **Post liberalisation results**

### ***Growth***

Firm growth prospects are positively related to the book value of the total debt ratio. From this outcome, it can be concluded that growth firms in the post liberalisation regime continue to accumulate debt to finance growth. This observation corroborates the findings of Titman and Wessels (1988: 4) for firms listed in the annual Compustat industrial files and Al Najjar (2011: 12) for firms in Jordan.

### ***Tangibility***

The asset tangibility variable is positively related to leverage and the associated coefficient is significant at the 1 percent level. This result suggests that firms in the post liberalisation regime use their assets as collateral for debt. Most empirical studies on firm specific determinants of capital structure have found a similar positive association. For example, Rajan and Zingales (1995: 1453) find a direct relationship between asset tangibility and book value of total leverage. Booth *et al.* (2001: 112) observe a similar relationship for a sample of emerging market economies. Mutenheri and Green (2003: 166) document a strong positive association for Zimbabwean listed non-financial firms for the post reform period (1995-1999). Similarly, Gwatidzo and Ojah (2009: 15) report a statistically significant positive relationship with total debt ratios for firms in Nigeria and South Africa. These findings are a confirmation of Jensen and Meckling's (1976: 305) argument that agency costs of debt can be mitigated by a high collateral value of assets.

## ***Profitability***

The profitability variable is negatively correlated to the book values of the total debt ratio. The associated p-value is 0.001. The negative association reported here confirms the prediction of Myers and Majluf (1984: 188), and is consistent with the empirical findings for the financing decisions of firms in both the developed and emerging market economies. For example, Rajan and Zingales (1995: 1457) and Wald (1999: 169) document similar results for firms in the industrialised economies. Furthermore, the results are consistent with Booth *et al.* (2001: 112) for firms in emerging markets and Gwatidzo and Ojah (2009: 9) for firms in South Africa and Ghana. The evidence documented here suggests that firms operating in both the developed and developing economies follow a pecking order when financing investment.

## ***Size***

The size coefficient is positively correlated to the book value measure of the total debt ratio. The observed relationship is consistent with the predictions of capital structure theory suggesting that larger firms have more capacity to access debt finance than their smaller counterparts. Irrespective of the proxy used, most empirical studies confirm the positive association between size and leverage, as documented in this study. This is mainly because larger firms can negotiate for loans on more favourable terms. This enables them to take on more debt at lower interest rates. Furthermore, Eriotis *et al.* (2007: 324) emphasise that larger firms are less risky than smaller firms. Therefore, banks are willing to loan them more funds.

## ***Taxes***

The expected sign for the tax coefficient is negative and significant at the 10 percent level. The evidence documented here suggests that taxes play a mildly significant role in the determination of leverage. The negative association observed in the post liberalisation regime confirms the results for Negash (2002: 26) who observes South

African firms over a relatively similar period. Given that tax rates in South Africa were on a declining trend, there could have been little incentive for firms to take advantage of the tax deductibility of interest through the accumulation of more debt. Frank and Goyal (2009: 13) draw similar conclusions for the book value measures of total leverage.

### ***Dividend payout***

The dividend payout variable is negatively correlated to the book value of the total debt ratio. The correlation coefficient is mildly significant at the 10 percent level. This negative association is consistent with the dividend relevancy theory of Lintner (1962: 243) and Gordon (1963: 264). They have argued that investors value the next dollar of dividends more than future capital gains. In effect, the perceived riskiness of a dividend paying firm should be lower than that of a non dividend payer. The required return of a dividend paying firm reduces with an increase in dividends thereby increasing the market value of equity. All else being equal, the subsequent increase in the market value of equity should reduce the debt ratio for dividend increasing firms.

Furthermore, the evidence documented here is consistent with the dividend signalling theory, which suggests that dividend increases are associated with managements' confidence about the stability of expected cash flows. Specifically, Bhattacharya (1979: 259) and John and Williams (1985: 1053) predict a positive correlation between dividends and future cash flows. The subsequent increase in the market value of equity reduces the debt ratio.

### **7.6.5 The market value of the total debt ratio (pre and post liberalisation)**

Table 7.20 reports the GMM estimates for the capital structure determinants of the market value of the total debt ratio. The results are shown for the pre and post liberalisation periods.

**Table 7.20: GMM estimates of target capital structure (Market total debt ratio)**  
**Arellano-Bond/Bover dynamic panel estimation (Two-step results)**

Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM Coefficient	SYS GMM Coefficient	DIFF GMM Coefficient	SYS GMM Coefficient
TD/TA(M) <sub>i,t-1</sub>	0.60510***	0.5698***	0.2685***	0.2918***
Growth	-0.00192	0.0098	-0.0056***	-0.0029***
Tangibility	0.27142***	0.4929***	0.5159***	0.3477***
Ndts	0.34665	-0.7956	-1.2753***	-1.8271***
Profitability	-0.03422	-0.0916**	-0.0169**	-0.0050
Size	0.00538	-0.0044	0.1138***	0.0098***
Taxes	-0.00105	-0.0032	-0.0334***	-0.0036***
Dividends	-0.00143	0.0028	-0.0056***	-0.0067***
<b>Wald (Joint)</b>				
Prob>chi2	0.0000	0.0000	0.0000	0.0000
Wald (Dummy)	0.0580	0.0360	0.0000	0.0000
Sargan	0.3500	0.1792	0.7951	0.1167
Prob>chi2				
Correlation 1	0.0010	0.0285	0.0051	0.0068
Correlation 2	0.1600	0.526	0.2103	0.4548
	280	350	688	768

Notes: This table reports the two-step Arellano-Bond/Bover dynamic panel results for the market value measures of the total debt ratio. Results are robust to panel specific heteroscedasticity and autocorrelation. The results are reported for the pre and post liberalisation periods. \*, \*\*, \*\*\* indicate significance levels at the 10%, 5% and 1% respectively.

- **Pre liberalisation results**

### **Tangibility**

The coefficient of the tangibility variable is positive and significant at the 1 percent level. This direct association indicates that asset tangibility in the pre liberalisation regime served as collateral for access to debt finance.

### **Profitability**

The profitability variable is inversely correlated to the market value of the total debt ratio. The correlation coefficient is significant at the 5 percent level. This observation suggests that firms in the pre liberalised regime followed a pecking order in their financing decisions. The inverse association observed confirms the empirical results of the static panel data models employed by Abor and Biekpe (2005: 44) for firms in Ghana,



Delcoure (2007: 411) for firms in European transitional economies and Gwatidzo and Ojah (2009: 9) for firms South Africa.

The dynamic model of capital structure employed by Ozkan (2001: 187) also confirms an inverse relationship between firm profitability and leverage. This relationship demonstrates that firms operating in the pre liberalisation era followed a pecking order in their financing decisions. These empirical findings support the predictions of Myers and Majluf (1984: 188) that firms that are more profitable will prefer to use retained earnings. Therefore, they will have lower debt ratios. However, Mutenheri and Green (2003: 166) document a positive, but insignificant association for the Zimbabwean pre reform period.

- **Post liberalisation results**

### ***Growth***

The growth variable has an expected negative sign, and the coefficient is statistically significant at the 1 percent level. Overall, this direct relationship corroborates the empirical findings of Titman and Wessels (1988: 4) and Delcoure (2007: 414), among others. The positive association suggests that growth firms require external funding to finance their future growth prospects.

### ***Tangibility***

As predicted by the theoretical models of capital structure, the coefficient of the asset tangibility variable is positive and significant at the 1 percent level. A high proportion of fixed assets in the firm's balance sheet can serve as collateral for lenders of finance. Moreover, in the event of bankruptcy, a higher proportion of tangible assets could enhance the salvage value of the firm's assets. Lenders of finance are thus willing to advance loans to firms with a high proportion of tangible assets.

This relationship is a direct confirmation of one of the trade-off theory predictions that firms with relatively safe tangible assets will be less exposed to costs of financial distress. These results are supported by most of the empirical evidence on the effects of asset structure on leverage. For example, Rajan and Zingales (1995: 1453) document a positive correlation for firms in seven industrialised economies. Likewise, Booth *et al.* (2001: 112) find a similar correlation for a sample of firms in emerging market economies. In contrast, Abor and Biekpe (2005: 43) and Sheikh and Wang (2011: 127) report negative correlations between asset tangibility and leverage for firms in Ghana and Pakistan respectively.

### ***Non-debt tax shields***

The non-debt tax shield coefficient is negative and significant at all conventional levels. This negative effect shows that firms with high depreciation charges have little incentive to access more debt. This relationship supports the DeAngelo and Masulis (1980: 3) hypothesis that tax advantages of debt are lower for those firms with opportunities to avoid tax through other related non-debt tax shelters. The dynamic panel data models employed by De Miguel and Pindado (2001: 77) and Ozkan (2001: 187) also document the negative association found in this study. However, Bradley *et al.* (1984: 873), Barclay *et al.* (1996: 210) and Chang *et al.* (2009: 209), among others, provide evidence suggesting that non-debt tax shields have a positive impact on firm leverage.

### ***Size***

The coefficient of the size variable is positive and statistically significant at the 1 percent level. This relationship confirms the prediction of the theory that size can be considered as an explanatory predictor for variations in firm leverage. The results support the empirical findings of Booth *et al.* (2001: 112), Deesomsak, *et al.* (2004: 399), Huang and Song (2006: 28) and Eriotis *et al.* (2007: 328), among others. However, Qiu and La (2010: 284) document a negative relationship between size and

total leverage for Australian firms. Similarly, Nunkoo and Boateng (2010: 987) find a negative but insignificant association between size and leverage for Canadian firms.

### ***Taxes***

The coefficient of the tax variable is negative and significant at the 1 percent level. The documented inverse coefficient is an indication that firms in the post liberalisation regime respond to increased effective tax rates by issuing less debt. The evidence documented here suggests that taxes play a mildly significant role in the determination of leverage. The negative association observed in the post liberalisation regime confirms the empirical work of Negash (2002: 26) who observes South African firms over a relatively similar period. Given that tax rates in South Africa were on a declining trend, there could have been little incentive for firms to take advantage of the tax deductibility of interest through the accumulation of more debt. Ngugi (2008: 620) and Gwatidzo and Ojah (2009: 13) find insignificant correlations between taxes and leverage for Kenya and South Africa respectively. However, Frank and Goyal (2009: 13) find strong and positive correlations between taxes and the market value of total leverage for non-financial firms in the United States of America.

### ***Dividend payout***

The dividend payout variable exerts a negative influence on the market value of the total debt ratio. The coefficient is statistically significant at the 1 percent level. The negative dividend association provides evidence that dividend increases are associated with a significant decrease in total leverage. The evidence documented here is consistent with the dividend signalling theory, which suggests that dividend increases are associated with managements' confidence about the future stability of cash flows thereby increasing the market value of equity relative to debt. The subsequent increase in the market value of equity reduces the debt ratio.

## 7.6.6 Firm specific determinants of debt maturity (pre and post liberalisation)

Table 7.21 reports the GMM estimates for the capital structure determinants of the book value of the short term debt ratio. The results are shown for the pre and post liberalisation periods.

**Table 7.21: GMM estimates of target capital structure (short term debt ratio)**

Arellano-Bond/Bover dynamic panel estimation (Two-step results)				
Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM Coefficient	SYS GMM Coefficient	DIFF GMM Coefficient	SYS GMM Coefficient
STD/TA <sub><i>i,t-1</i></sub>	0.5035***	0.5710***	0.3179***	0.3745***
Growth	0.0001	-0.0008	0.0023***	0.0099***
Tangibility	-0.2379***	-0.0363	0.1931***	-0.0501***
Ndts	-0.1626	-0.1367	-0.4833***	0.1040
Profitability	-0.1850***	-0.2676***	-0.0218***	-0.1012***
Size	-0.0031	0.0226***	0.0699***	0.0124***
Taxes	0.0031	0.0090*	0.0016	-0.0093***
Dividends	0.0000	0.0081	0.0009***	0.0061***
<b>Wald</b>				
Prob>chi2	0.0000	0.0000	0.0000	0.0000
Wald (Dummy)	0.3190	0.0001	0.0000	0.0000
Sargan	0.2684	0.1237	0.7502	0.2406
<b>Prob&gt;chi2</b>				
Correlation 1	0.0174	0.0079	0.0005	0.0006
Correlation 2	0.3342	0.3276	0.0920	0.2406
No. of Observations	280	350	688	768

Notes: This table reports the two-step Difference and System GMM dynamic panel results for the book value measures of the short term debt ratio. Results are robust to panel specific heteroscedasticity and autocorrelation. \*, \*\*, \*\*\* indicate significance levels at the 10%, 5% and 1% respectively.

- **Pre liberalisation results**

### ***Profitability, Size and Taxes***

The System GMM output generates significant results for profitability, size and taxes. The coefficients for profitability and size are negative and statistically significant at the 1 percent level. Profitability is associated with a longer debt maturity structure. This implies that profitability is a significant criterion for securing longer term finance in the

pre liberalisation period. Similarly larger firms have longer debt maturity structures. This indicates that larger firms possess the reputational capital to borrow on a longer term basis. On the other hand, taxes are positively related to the maturity structure of debt. However, the correlation coefficient is mildly significant at the 10 percent level. This relationship suggests that firms that are subject to higher effective tax rates reduce their maturity structure of debt.

- **Post Liberalisation results**

### ***Growth***

The coefficients of the growth variable for firms in the post liberalisation regime are all statistically significant at the 1 percent level. Growth prospects are associated with an increase in the short term debt ratio. This implies that growth firms are associated with shorter debt maturities. The plausible explanation to this observation is that the variability in earnings associated with growth firms makes it difficult for them to access long term debt. Hence debt with shorter maturities is more accessible for these firms. As observed by Barclay and Smith (2005: 14), high growth firms tend to borrow on a short term basis. The rationale given for this observation is that, in the event of financial distress, short term debt allows growth firms to reorganise their debt position easily.

### ***Tangibility***

The asset tangibility variable has a negative sign. The coefficient is statistically significant at the 1 percent level. This inverse relationship is an indication that firms with a high proportion of tangible assets increase the maturity structure of their debt. This relationship lends support to the theory that a high value of tangible assets allows firms to borrow on a longer term basis. In the event of bankruptcy, the tangible assets can easily be collateralised.

### ***Profitability***

The profitability variable is negatively correlated to the short term debt ratio. The coefficient is statistically significant at the 1 percent level. This negative association indicates that profitable firms operating in the post liberalised regime increase the maturity structure of their debt. This is expected, since higher profits provide credibility for firms to take on longer term debt.

### ***Size***

The size variable is positively correlated to the short term debt ratio, suggesting that large firms operating in the post liberalised regime issue debt with shorter debt maturities. This finding contradicts the theoretical predictions that large firms have a lower probability of financial distress, and that they have lower information asymmetries associated with debt issues. This should allow them to borrow on a longer term basis.

### ***Taxes***

The tax variable has a negative coefficient which is statistically significant at the 1 percent level. Hence, it can be deduced that corporate tax rates are negatively associated with short term debt. This finding suggests that an increase in the effective tax rate is associated with longer debt maturities. This result supports the tax clientele argument of Newberry and Novack (1999: 1) that firms that are subject to high effective tax rates will increase their debt maturity structure. The results reported here support the empirical work by Antoniou *et al.* (2006: 187). They observe that the increase in the effective tax rate causes a statistically significant increase in the maturity structure of debt for firms in Germany. Furthermore, higher effective taxes could be associated with higher profitability<sup>36</sup>. Hence, the negative sign is not surprising. Due to the increased

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<sup>36</sup> According to Table 7.3, the correlation coefficient between tax and profitability variable is 0.40 indicating that effective tax rates and profitability are correlated.

profitability, firms that pay higher taxes will have easier access to longer term financing than firms with lower effective taxes.

### ***Dividend payout***

The dividend payout ratio is positively correlated with the short term debt ratio. The coefficient is significant at the 1 percent level. The positive correlation suggests that an increase in the dividend payout is associated with a reduction in the debt maturity structure of firms.

## **7.7 THE LONG RUN TARGET ADJUSTMENT MODEL AND TRANSACTION COSTS**

This section discusses the dynamics of transaction costs and the associated speed of adjustment for the target adjustment model of capital structure. The effect of relaxing Modigliani and Miller's (1958: 201) capital structure irrelevance assumption suggests that there are firm specific impediments that constrain firms from achieving the desired level of target leverage. Such imperfections include taxes, flotation costs, adjustment costs and other constraints (Ozkan, 2001: 176).

In the context of financial liberalisation, a constrained economy is characterised by an underdeveloped financial system with relatively fewer financing options. Consequently, borrowing costs should be high. Inevitably, firms operating in this environment will adjust to the optimal target with a relatively low speed of adjustment.

Accordingly, firms operating in a liberalised economy should face fewer impediments in their efforts to adjust to a target level of leverage. The presence of an active and developed stock market, the re-emergence of international financial institutions and an active public debt market promotes competition in the domestic financial sector. This lowers borrowing costs. Effectively, the speed of adjustment to the desired target level of leverage should be higher.

Table 7.22 summarises the results of the target adjustment model for the book and market value measures of leverage. The results of the coefficient of the lagged dependent variables are reported using the System GMM output. The results for the target adjustment model confirm the existence of transaction costs for both regimes. However, the coefficients of the lagged dependent variables are lower for the post liberalisation period. This finding confirms the earlier conjecture that the easing of financial constraints causes firms to adjust to the optimal leverage ratio relatively fast.

**Table 7.22: Summary of the coefficients of the lagged dependent variables**

Variable	Pre liberalisation		Post liberalisation	
	DIFF GMM	SYS GMM	DIFF GMM	SYS GMM
	Coefficient	Coefficient	Coefficient	Coefficient
$TD/E(B)_{i,t-1}$	0.4509***	0.6096***	0.14765***	0.1343***
$TD/E(M)_{i,t-1}$	-0.0108***	-0.0159***	0.2777***	0.2739***
$TD/TA(B)_{i,t-1}$	0.71915***	0.7434***	0.4441***	0.5350***
$TD/TA(M)_{i,t-1}$	0.60510***	0.5698***	0.2685***	0.2918***
$STD/TA_{i,t-1}$	0.5035***	0.5710***	0.3179***	0.3745***

Notes: This Table summarises the coefficients on the lagged dependent variable for the Difference and System GMM models.  $TD/E(B)_{i,t-1}$  is the book value of the lagged total debt to equity ratio.  $TD/E(M)_{i,t-1}$  is the market value of the lagged total debt to equity ratio.  $TD/TA(B)_{i,t-1}$  is the book value of the lagged total debt to total assets ratio.  $TD/TA(M)_{i,t-1}$  is the market value of the lagged total debt to total assets ratio.  $STD/TA_{i,t-1}$  is the ratio of the lagged short term debt to total assets. \*\*\*, \*\*, \* indicate levels of significance at the 1, 5 and 10 per cent levels respectively.

### 7.7.1 Transaction costs for the book value of the debt to equity ratio

The coefficient of the lagged dependent variable is a measure of the transaction costs. The transaction costs reduce dramatically from 0.61 in the pre liberalisation period to 0.13 in the post liberalisation period. Both coefficients are significant at the 1 percent level. The speed of adjustment ( $1 - \delta$ ) to the desired level of leverage increases from 0.39 in the pre liberalisation period, to 0.87 in the post liberalisation period.

### 7.7.2 Transaction costs for the market value of the debt to equity ratio

The Sargan test for the results of the pre liberalisation period suggests that the instruments used for the lagged variables are not valid. On that account, the results provided in the first two columns of Table 7.17 cannot be relied on. However, the results



presented for the post liberalisation period are valid. The coefficient for the lagged dependent variable for the post liberalisation period is 0.27 and is significant at the 1 percent level. The speed of adjustment to the desired target level of leverage is 0.73, which is relatively fast.

### **7.7.3 Transaction costs for the book value of the total debt ratio**

The coefficient of the lagged book value of the total debt ratio variable adjusts from 0.74 in the pre liberalisation period to 0.54 in the post liberalisation period. Two conclusions can be drawn from this finding. Firstly, transaction costs reduce significantly thereby confirming an increased speed of adjustment to the desired level of leverage for the post liberalisation period. Secondly, transaction costs for the total debt ratios are higher than transaction costs for the debt to equity ratios for both periods. This suggests that the speed of adjustment to the desired total debt ratio is slower than the target adjustment speed observed for the debt to equity ratios.

### **7.7.4 Transaction costs for the market value of the total debt ratio**

The coefficient of the lagged dependent variable for the pre liberalisation period is 0.57, and it reduces to 0.29 in the post liberalisation period. As documented for the other measures of leverage, a reduction in transaction costs is also observed here. The speed of adjustment to the desired level of the market value of leverage increases from 0.43 in the pre liberalisation period, to 0.71 in the post liberalisation period.

### **7.7.5 Transaction costs for the short term debt ratio**

Transaction costs for the post liberalisation regime are lower than the costs observed for the pre liberalisation period. This reduction provides evidence that the adjustment to the desired debt maturity structure is faster for the post liberalisation period. The coefficient of the lagged short term debt variable reduces from 0.57 in the pre liberalisation regime, to 0.37 in the post liberalisation regime. The speed of adjustment

increases accordingly, from 0.43 (before financial liberalisation), to 0.63 (after financial liberalisation).

#### **7.7.6 A comparison of the adjustment costs for select countries**

Table 7.23 compares the adjustment costs and the related speed of adjustment to the desired level of total debt for firms in selected countries. The fifth row shows the transaction costs and the associated speed of adjustment found in this study<sup>37</sup>. The transaction costs for South Africa are relatively comparable to those of the firms in the United States, the United Kingdom and France. This shows that the financial environment in the South African post liberalisation period exhibits some attributes of a well developed market.

As a result, firms operating in such an environment will face relatively high costs of being in disequilibrium. That being the case, they will adjust to their desired level of optimal leverage relatively fast. It is noted, however, that firms in Spain and Kenya adjust to their target leverage faster than the rest of the firms in the other countries. The authors (De Miguel and Pindado (2001: 90) and Ngugi (2008: 618)) attribute these high adjustment speeds to the low proportion of debt finance in these countries. Even though the capital markets in these countries may be less developed, marginal adjustments of leverage may be accomplished relatively fast.

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<sup>37</sup> All studies estimate their dynamic models on the total debt ratio. The only exception is De Miguel and Pindado (2001: 90) who uses market value measures of the long term debt to long term debt plus equity ratio. This study uses the post liberalisation book value total debt ratio for comparison purposes.

**Table 7.23: A comparison of transaction costs for firms in selected countries**

Country	Transaction costs	Speed of Adjustment <sup>38</sup>	Reference
France	0.61	0.39	Antoniou <i>et al.</i> (2008: 78)
Germany	0.76	0.24	Antoniou <i>et al.</i> (2008: 78)
Japan	0.89	0.11	Antoniou <i>et al.</i> (2008: 78)
Kenya	0.30	0.70	Ngugi (2008: 618)
<b>South Africa</b>	<b>0.54</b>	<b>0.46</b>	<b>This Study</b>
Spain	0.21	0.79	De Miguel and Pindado (2001: 90)
United Kingdom	0.59	0.41	Ozkan (2001: 188)
United States	0.68	0.32	Antoniou <i>et al.</i> (2008: 78)

<sup>38</sup> The speed of adjustment is reported from the System GMM estimates

### 7.7.7 The determinants of the adjustment speed

**Table 7.24: Determinants of adjustment speed**

	Pre Liberalisation		Post Liberalisation	
	TDTA(B)	TDTA(M)	TDTA(B)	TDTA(M)
$LEV_{i,t-1}$	2.3794*	7.5881***	-0.0030	0.2662
$GROWTH*LEV_{i,t-1}$	0.0191	0.0723	-0.0004	0.1486***
$SIZE*LEV_{i,t-1}$	-0.3983**	-1.4652***	0.1639***	-0.0830***
<b>Sargan</b>	0.1002	0.1208	0.3491	0.1061
<b>Correlation 1</b>	0.0022	0.0081	0.0512	0.0469
<b>Correlation 2</b>	0.3600	0.2279	0.4961	0.4716
<b>Wald test (Prob&gt;Chi2)</b>	0.0000	0.0000	0.0000	0.0000
<b>Number of observations</b>	350	350	826	688
<b>Number of groups</b>	70	70	69	69

Notes: This Table reports the determinants of the adjustment speed towards the target level of capital structure.  $LEV_{i,t-1}$  is the lagged dependent variable for the book and market values of the total debt ratio.  $GROWTH*LEV_{i,t-1}$  is the interaction between the growth and the lagged leverage variables.  $SIZE*LEV_{i,t-1}$  is the interaction between size and the lagged leverage variable. \*\*\*, \*\*, \* indicate significance levels at the 1, 5, and 10 per cent levels respectively.

Table 7.24 summarises the determinants of the adjustment speed for the pre and post liberalisation regime. In the pre liberalisation period, the coefficient on the interaction term between growth and lagged leverage for both measures is insignificant. This evidence suggests that firm growth prospects are not significant determinants of the adjustment speed for firms operating in the pre liberalisation regime. However, the interaction term on the coefficient of the market value of total leverage is positive and statistically significant at the 1 percent level. The interpretation of this relationship is that growth firms reduce their adjustment speed. Following Myers and Majluf (1984: 188), firms with high growth prospects will avoid debt due to the potential costs of financial distress. This result contradicts the conjecture that growth firms will adjust rapidly to their target level of leverage.

The impact of size on leverage for both regimes is statistically significant. For the pre liberalisation period, the coefficient on the interaction term is negative and statistically significant. This outcome lends support to the conjecture that large firms will adjust rapidly to their target levels of leverage. Consistent with Banerjee, Heshmati and Wihlborg (2004: 275), large firms are more concerned about capital structure decisions than their smaller counterparts. However, the expected signs for the post liberalisation period are contradictory. This inconsistency was also found by Drobetz and

Wanzenried (2006: 954). Hence, it is difficult to interpret the post liberalisation results accordingly.

### **7.7.8 Summary of the results presented by the dynamic model of capital structure.**

The main results emanating from the dynamic model of capital structure provide some confirmations of the major theories of capital structure; there is little evidence suggesting that firm specific determinants of capital structure are significantly correlated to all measures of leverage for the pre liberalisation regime. Firm growth prospects are positively related to the book value of the debt to equity ratio for the post liberalisation regime. A negative relationship is observed for the market value of the debt to equity ratio for the post liberalisation regime. Firm growth prospects are also positively related to the book value of the total debt ratio for both regimes, and negatively correlated to the market value of the total debt ratio for the post liberalisation regime.

Asset tangibility is mostly directly correlated with all measures of leverage. The effect is significant for both regimes. Non-debt tax shields are mostly negatively associated with all measures of leverage. The effect is mostly significant for the post liberalisation regime.

Profitability is positively correlated with the book value of the debt to equity ratio for both regimes, and is positively associated with the market value of the debt to equity ratio for the post liberalisation regime. Profitability also exerts a negative influence on both measures of the total debt ratio.

Size is directly related to most measures of leverage with the exception of the market value of the debt to equity ratio for the post liberalisation regime. The direct relationship is prominent for both regimes. Taxes are positively associated with the book value of the debt to equity ratio and negatively associated with the market value of the debt to equity ratio. The negative correlation is persistent with the rest of the measures of leverage.

Dividend payout is positively correlated to the book value of the debt to equity ratios and negatively related to the rest of the measures of leverage. Growth firms are associated with shorter debt maturities. This is significant for the post liberalisation period. Firms with a higher proportion of fixed assets increase the maturity structure of their debt. This relationship applies to both regimes.

Profitable firms increase the maturity structure of their debt. This is evident for both periods. Larger firms operating in both regimes reduce the maturity structure of their debt. Firms that are subject to higher effective tax rates increase their debt maturities. This observation is significant for the post liberalisation regime.

Firms that increase their dividend payout reduce their debt maturity structure. This result is significant for the post liberalisation period. Transaction costs reduce in the post liberalisation regime and the associated speed of adjustment increases accordingly for all measures of leverage. The size of the firm is a significant determinant of the adjustment speed. Particularly, large firms adjust their target relatively fast. This is true for the pre liberalisation period.

## **7.8 CHAPTER SUMMARY**

In this chapter, the results of the static and dynamic panel data models of capital structure were reported and discussed extensively. The first empirical issue was to establish whether financial liberalisation has a significant impact on the book and market value measures of leverage. The sample was split into three different sets, owing to the possibility that firms of varying sizes may respond differently to the process of financial reforms.

The results obtained have empirical significance. Particularly, stock market liberalisation has a significant negative impact on all measures of leverage. The effect is more pronounced for larger firms. Larger firms respond more to this process due to their ability to issue informational sensitive securities with relative ease. Furthermore, larger

firms' securities are more liquid and actively traded on the stock exchange. Hence, a strong and significant reduction in leverage for large firms is observed.

The removal of sanctions has a negative influence on all the measures of leverage. This is expected due to documented evidence that the cost of equity lowers following the lifting of economic sanctions. There is little support for the impact of domestic financial liberalisation on firm capital structures. Despite the fact that the lowering of the reserve requirements affects banks' ability to provide loans, these measures may not have a significant impact on banks' ability to finance the private sector. Hence, an insignificant impact is expected.

Capital account liberalisation has a significant positive impact on firm leverage. As exchange controls are eased, firms finance their repatriations with debt. Furthermore, capital account liberalisation provided opportunities for firms to borrow from abroad. The foreign borrowing could have contributed to the increase in the debt ratios for domestic firms. Larger firms appear to benefit more from capital account liberalisation than smaller firms. As the theory goes, large firms have more credibility and reputation in the markets. They can thus manage to raise foreign debt easily compared to smaller firms. Hence, this observation is expected.

There is strong evidence that the development of the stock market contributes to further domestic borrowing. Contrary to expectations, the size of the banking sector is negatively related to leverage. The internationally financed firms and financially constrained firms do not appear to be affected significantly by the process of financial liberalisation. Furthermore, the importance of internal finance is insignificant in all the models.

In terms of debt maturity structures, the notable finding is that stock market liberalisation increases the debt maturity structure of all the firms. The liberalisation of the JSE causes firms to access more long term finance. This finding suggests that the improved

corporate governance and transparency laws associated with the development of the capital markets provides more credibility for firms to borrow on a longer term basis.

Using regime dummies, there is sufficient evidence to infer that the impact of profitability on leverage shifted in 1993 and 1995. Similarly, the impact of effective taxes on the book value of the debt to equity ratio shifted in 1993 and 1995.

The results of the dynamic model of capital structure provide evidence of transaction costs for firms operating in both regimes. The speed of adjustment to the desired target level of leverage increases dramatically in the period after financial liberalisation. This increase in the speed of adjustment is supported by the lower cost of external finance for the post liberalisation period. The capital structure model has documented relationships that support most of the theories of capital structure. Therefore, there is strong evidence that firms in the post liberalisation regime follow a pecking order in financing investment. Growth prospects are positively correlated to both measures of the debt to equity ratio and negatively correlated to both measures of the total debt ratio.

Asset tangibility and size are positively related to leverage, suggesting that firms use their assets as collateral for debt and that larger firms have a better capacity to accumulate more debt. Taxes are negatively related to leverage, thus contradicting Modigliani and Miller's (1963: 433) proposition that higher taxes encourage firms to borrow more. Dividend payout is negatively correlated to the market value of the debt to equity ratio and to both measures of total leverage. Strong evidence is found for the DeAngelo and Masulis (1980: 3) hypothesis that non debt tax shields are inversely related to leverage.

The growth and size variables were interacted with the lagged leverage variable. It was found that size has a significant impact on the adjustment speed of capital structure. In particular, larger firms adjust rapidly to their target leverage. The next chapter concludes the overall study.



## CHAPTER 8

### CONCLUSIONS AND IMPLICATIONS FOR FURTHER RESEARCH

#### 8.1 INTRODUCTION

This study has provided a sound theoretical and empirical basis for undertaking a comprehensive analysis on the effects of multiple liberalisations on capital structure of listed non-financial firms in South Africa. The preceding chapter has detailed extensively the results of the static and dynamic models of capital structure. The results generated by these models provide resounding evidence that financial liberalisation in general has significant effects on firm financing behaviour. As a result, there is a need to summarise the material aspects of the theoretical underpinnings of the study and to highlight the empirical findings documented in the previous chapter.

##### 8.1.1 Goal of this chapter

The main goal of this chapter is four-fold; firstly, to summarise by way of concluding remarks the theoretical and empirical significance of the findings. Secondly, to highlight the contribution of this study to the existing body of knowledge on capital structure. Thirdly, to acknowledge some limitations of the study, and finally, to suggest further avenues for future research.

##### 8.1.2 Layout of this chapter

The rest of this chapter is organised as follows: Section 8.2 provides a concise summary of the theoretical conclusions of the study. Section 8.3 highlights the main empirical findings of the study. Section 8.4 outlines the theoretical and methodological contributions of this study. Section 8.5 acknowledges the shortcomings of the study and provides avenues for future studies.

## **8.2 THE THEORETICAL CONCLUSIONS OF THE STUDY**

The main purpose of the extensive literature review on the theory of capital structure and financial liberalisation was two-fold. Firstly, to synthesise the literature and where possible, draw reasonable conclusions from the issues arising out of the various studies. Secondly, to enhance our understanding of firm financial behaviour.

### **8.2.1 The theoretical determinants of capital structure**

The effect of relaxing Modigliani and Miller's (1958: 201) capital structure irrelevance proposition suggests that there are theories of firm specific impediments that cause shifts in firm leverage.

The trade-off theory of Kraus and Litzenberger (1973: 911) hypothesises that firm managers attempt to balance the benefits of the present value of interest tax shields against the potential cost of financial distress. Extensive analysis of the documented literature shows that there is substantial evidence for the main predictions of the trade-off theory.

Jensen and Meckling's (1976: 305) agency cost theory postulates that firm managers will not always act in the firm's shareholders interest. Various empirical methodologies have been used by different researchers to detect the presence of agency costs. Overall, it appears that agency costs affect firm financial choices.

Ross' (1977: 23) signalling theory posits that if managers have inside information, their choice of capital structure will signal information to the market. The intuition is as follows: an issue of debt is seen as a credible signal to the market that the firm is confident about its future cash flows; hence debt issues should increase the market value of firms. On average, the signalling theory seems to hold.

The pecking order theory of Myers and Majluf (1984: 188) hypothesises that an issue of equity is generally perceived negatively by the market. Therefore, in order to avoid the information costs associated with equity, a firm is more likely to issue debt. Overall, the evidence gathered on the pecking order is mixed. There are two main reasons for this. Firstly, financing decisions are subject to a number of factors that may influence capital structure differently. Secondly, the regression results in the empirical studies are dependent on the choice of the methodology.

Myers' (1977: 147) contracting cost theory predicts that firms whose value consists mainly of the present value of intangible investment opportunities will avoid issuing excessive debt. These firms will choose lower debt ratios to minimise the adverse effects of the underinvestment problem. Conversely, large mature firms with fewer investment opportunities will choose high debt ratios because of the lower possibility of financial distress costs. Overall, the evidence on this prediction depends on the choice of methodology. The issues emanating from the theoretical analysis suggests that when the market to book value of assets is used, a negative association is observed. When growth in assets and sales variables are used, a positive association is normally observed.

### **8.2.2 Factors correlated with firm leverage**

From the review of the related literature, a number of factors have been identified to affect the cross-sectional variation in firm leverage. The differences in the capital structure of firms have been attributed to the development of the stock markets and the financial sector. Irrespective of the proxy used, evidence shows consistently that there is a direct relationship between size and leverage. An inverse association between profitability and leverage is observed in most of the studies reviewed. This confirms the predictions of the pecking order hypothesis.

There is resounding evidence that firms in both the developed and developing economies use their asset base as collateral for further borrowing. Although age is

theoretically assumed to represent the reputational capital possessed by firms, the expected sign of the age coefficient is inconsistent in the regressions of the reviewed studies. Hence, no logical conclusion can be inferred by the analysis of literature performed in this study. The literature on the effects of firm growth prospects on leverage shows that the growth coefficient tends to be positive if growth in assets or sales is used. If the market to book value of equity ratio is used, then the opposite sign is observed.

Attempts to establish the true effect of tax on leverage have yielded inconclusive results. Modigliani and Miller's (1963: 433) prediction that taxes are directly related to leverage is confirmed by some studies. Nonetheless, other studies report a negative association between tax variables and leverage. Likewise, the non-debt tax shield hypothesis of DeAngelo and Masulis (1980: 3) has been strongly confirmed by most of the studies reviewed in this analysis. However, contradictory positive correlations are observed by some studies, especially where non-debt tax shields are highly correlated to asset tangibility.

A number of studies have ignored the impact of dividend payout on firm leverage. Accordingly, the effect of dividend policy on firm leverage has been reviewed from the aspect of its impact on the market value of the firm. The literature reviewed has almost consistently shown that dividend increases are positively correlated to firm value. Hence, a negative association between dividend payout and leverage is implied.

There are notable differences between the corporate finance patterns of firms in the developed and developing economies. The observed differences in the developed world are partly due to methodological differences. The pattern that has emerged from the analysis is that firms in developed countries rely more on internal finance than on debt and equity.

A non-uniform financing pattern is observed for firms in the developing countries. This has mainly been attributed to each firm's unique circumstance and the data definitions.

However, firms in developing countries rely less on internal financing and more on external financing and that firms in African countries exhibit similar levels of leverage to firms in other developing countries.

### **8.2.3 The theory of financial liberalisation**

The McKinnon (1973: 9) and Shaw (1973: 9) postulations of that financial liberalisation promotes economic growth through the deepening of financial markets have attracted considerable attention among economic researchers. From the theoretical analysis of the empirical evidence on financial liberalisation, there are several important issues to be noted. Firstly, it is clear that financial liberalisation impacts on the evolution of capital flows into the liberalised economy. Secondly, most reviewed studies have shown that financial liberalisation leads to the easing of financing constraints, thus increasing the risk of over borrowing, a situation that may be associated with financial crises. Lastly, financial liberalisation affects the capital structure of firms differently. Large firms respond differently to financial liberalisation compared to small firms. Firms with access to international equity are also impacted differently from domestically financed firms. Overall, financial liberalisation causes firms to prefer equity over debt.

### **8.3 THE EMPIRICAL FINDINGS OF THE STUDY**

This study was motivated by the evidence provided by empirical studies that financial liberalisation lowers the cost of equity capital, increases portfolio flows and reduces financing constraints. These observations provide a laboratory for testing the effects of these developments on the dynamics of firm financial structures.

This study finds that the lifting of international sanctions and the opening of the JSE to foreign investment lowers the book and market value debt ratios for all firms. The effect is more pronounced for larger firms. This observation is consistent with the Myers and Majluf (1984: 188) assertion that information asymmetries are lower for larger firms.

Therefore, it is not surprising that large firms respond more to financial liberalisation than their smaller counterparts.

Exchange control relaxations have a significant and direct impact on firms' leverage. Again, the impact is more pronounced for larger firms. Because of reputational capital, large firms are more capable of obtaining domestic and foreign debt at lower cost. As firms are permitted to repatriate and borrow funds from abroad, large firms will benefit more since they have the capacity to negotiate debt on more favourable terms.

The size of the stock and the banking sector has a significant impact on firm financial choices. Stock market development is positively related to leverage, and banking sector development is negatively related to leverage. This result is a direct confirmation of Demircuc-Kunt and Maksimovic's (1998: 2107) assertion that the differences in firm capital structures are attributed to the development of the stock market and the banking sector.

The liberalisation of the JSE causes firms to access more long term finance. This finding suggests that the improved corporate governance and transparency laws associated with the development of the capital markets provides more credibility for firms to borrow on a longer term basis.

The regime dummy variable technique reveals that the impact of profitability on the book and market values of leverage shifted in 1993 and 1995. The lifting of international sanctions and stock market liberalisation have the most significant impact on the stability of the regression parameters. Particularly, profitability, growth and taxes are the most affected.

The results of the dynamic model of capital structure provide evidence of transaction costs for firms operating in both regimes. The speed of adjustment to the desired target level of leverage increases dramatically in the period following financial liberalisation.

This increase in the speed of adjustment may imply fewer barriers to the target levels of leverage.

The dynamic capital structure model employed in this study has documented relationships that support most of the theories of capital structure. There is strong evidence that firms in the post liberalisation regime follow a pecking order in financing investment. The correlations for the growth prospects are dependent on the measure used for leverage. Growth prospects are positively correlated to both measures of the debt to equity ratio and negatively correlated to both measures of the total debt ratio. The negative correlation supports the contracting cost theory.

The asset tangibility and size variables are positively related to leverage. This finding suggests that firms use their assets as collateral for debt, and that larger firms have a better capacity to accumulate more debt. Taxes are negatively related to leverage, thus confirming Negash's (2002: 26) findings for South Africa and contradicting Modigliani and Miller's (1963: 433) proposition that higher taxes encourage firms to borrow more. Dividend payout is negatively correlated to the market value of the debt to equity ratio and to both measures of total leverage. Non-debt tax shields are significantly negatively related to leverage, thereby providing direct support for the DeAngelo and Masulis (1980: 3) hypothesis.

## **8.4 THE CONTRIBUTIONS OF THE STUDY**

### **8.4.1 The contribution to the knowledge gap**

The effects of globalisation on firm financial choices have been studied adequately for emerging markets, but the known empirical studies have mostly excluded South Africa. For example, Galego and Loayza (2000: 28) examine the macroeconomic developments and firm financial structures for Chilean firms. In addition, Bhaduri (2000: 413) examines financial liberalisation and capital structure for firms in India, and

Schmukler and Vesperoni (2006: 186) examine seven emerging economies in East Asia and Latin America.

The notable exception is Demirguc-Kunt and Maksimovic (1996: 341) who study the effects of stock market development on capital structure for firms in 30 countries, including South Africa. However, as their title suggests, their analysis is limited to the impact of stock and banking sector development on capital structure. The emphasis on South Africa closes this knowledge gap, and results are compared to the existing evidence emanating from other studies for emerging economies. Having said this, the evidence provided in this study corroborates well with the findings from other studies, particularly with the effect of the opening up of the stock market on leverage ratios.

The important aspect missing out of most studies on emerging markets is that other elements of financial liberalisation are excluded. As Kaminsky and Schmukler (2008: 253) advise that the focus on a single aspect of the financial market may yield incorrect results. Hence, this study has singled out four significant events that can be attributed to financial liberalisation. These include the lifting of international sanctions, the lowering of reserve requirements, the opening up of the JSE to allow inward and outward investment and the easing of exchange controls.

This disaggregation has provided new insights into the study of financial liberalisation and capital structure. From the analyses provided in this study, it is documented that the lifting of international sanctions causes firms to access the equity market more and the opening up of the stock market to foreign investment lowers the leverage ratio. Exchange controls relaxations cause firms to borrow more. The effect of financial liberalisation is more pronounced for large firms. It is further documented that stock market liberalisation increases the debt maturity structure of listed firms.

The shift from the pre liberalisation to the post liberalisation regime causes significant structural breaks in the firm determinants of capital structure. This suggests that the relationship of the firm determinants on capital structure changes over the period of



financial reforms. The impact of profitability on firm leverage appears to be the most affected relationship.

The dynamic model of capital structure reveals several important facts about the firm financing behaviour in a closed and open economy. Firstly, the study documents evidence of a long run target adjustment to the desired level of leverage. Secondly, a significant reduction in transaction costs is observed for the pre liberalisation regime. Lastly, firms in a liberalised economy adjust to their optimal target of leverage much faster than firms in a constrained economy.

#### **8.4.2 The methodological contribution of this study**

Recognising that financial liberalisation is a complex and gradual process, there is no model that can adequately compensate for the dynamic aspects of liberalisation. Where possible, the study has incorporated the gradual aspects of financial liberalisation. The successive lowering of reserve requirements and the gradual easing of exchange controls have been captured through the use of progressive dummies.

The study has investigated the contrasting effects of financial liberalisation on various sets of firms. The firms examined include internationally financed, domestically financed and firms categorised according to size.

Most studies use cross-sectional and static models to test the determinants of capital structure. This study has utilised stronger estimation techniques to compensate for the inadequacy of the cross-sectional and static models. As a result, the study is able to use relevant instruments to control for firm and time specific effects and problems such as endogeneity. The endogeneity problem arises due to, *inter alia*, the problem of misspecification in the observed capital structure relationship. Furthermore, differenced equations are estimated simultaneously with level equations as a “system” to minimise the loss of information in the dynamic capital structure model. This process yields significant efficiency gains in the modelling of capital structure determinants.

### **8.4.3 Lessons that can be learnt from this study**

Most studies on financial liberalisation and firm financial structure have documented that financial liberalisation lowers leverage. However, a closer examination of each aspect of financial liberalisation reveals that leverage is impacted differently by the different financial liberalisation events. This study concurs with the cautionary note put forward by McKinnon and Pill (1997: 189) that financial liberalisation may lead to excessive borrowing, possibly increasing the probability of financial crises. Specifically, capital account liberalisation is shown to increase the capacity of all sets of firms to borrow more.

Furthermore, the dramatic decrease in the adjustment costs for firms in the liberalised economy could exacerbate this problem further, since changes to the desired level of debt are accomplished relatively fast. Therefore, policy makers in South Africa and perhaps those African and other emerging countries that intend to liberalise further their capital accounts should take this into cognizance. It is quite clear that the capital controls that were in place prior to the global financial crisis of 2008 prevented further capital from leaving the South Africa. This helped stabilise the South African economy during this period. The finding that firms in the liberalised economy adjust to their target levels of leverage relatively fast could certainly exacerbate the over borrowing syndrome.

From the stock market liberalisation point of view, it is clear that firms access the equity market more thus lowering their debt ratios. The fears of excessive borrowing do not apply here. Further stock market liberalisations could help mitigate the effects of over borrowing.

A cautionary note needs to be emphasised; the globalisation process causes a wedge between large and smaller firms. It is quite clear that small firms do not benefit from financial liberalisation as much as the large firms. The larger firms seem to respond more to the process of financial liberalisation compared to the smaller firms. Policy

makers need to take this disparity into account and provide incentives for small firms to take advantage of the financial reforms which are intended to benefit all market participants.

## 8.5 SHORTCOMINGS AND SUGGESTIONS FOR FURTHER RESEARCH

This study was limited to JSE listed non-financial firms that operated prior to and after the period of financial liberalisation. As a result large non listed firms are excluded from the analysis due to the difficulty of obtaining financial statements for unlisted firms. It would be interesting if significant non listed firms are included in future studies to determine how they respond to the process of financial reforms. Furthermore, only 100 firms were examined over the period of 1989 to 2007. Incomplete financial records did not permit for inclusion of more firms. However, the use of panel data compensates for this by increasing the number of observations to 1100.

This study excluded the period of the global financial crisis mainly because the study was performed during this period. Hence, reported financial statements were mostly limited to the year 2007. Given more time, future research should control for this period and assess the dynamics of capital structure accordingly.

It was not possible to obtain several other variables that could have yielded interesting results. For example, data for international debt issues proved difficult to obtain. It was envisaged that firms that issue debt abroad should have a different capital structure from the rest of the firms. Further future analysis can be performed by distinguishing the evolution of public debt from bank borrowings. Data on publicly traded bonds is only available from 1995. It was therefore not possible to test the effects of the lifting of international sanctions, domestic financial sector liberalisation and stock market liberalisation on bonds traded on the BESA. These aspects of financial liberalisation occurred in the early 1990s. The evolution of the BESA was therefore examined descriptively.

Further robustness checks could have been performed on the growth variable owing to the argument put forward by Barclay and Smith (2005: 13) that the strong inverse relationship between firm growth prospects and leverage "... is simply the artificial result of large variations in stock prices ...". The variable that can be used as a substitute for the market to book ratio is R&D divided by sales. The structure of the financial reports generated by the financial database did not allow for this analysis.

The observation that the size of the banking sector is statistically significantly negatively correlated to leverage warrants further attention. Further analysis should be performed to assess the underlying impetus behind the negative correlation. At the moment, it can only be assumed that as the banking sector develops, so does the stock market. Given the significance of the stock market, it is possible that the evolution of private credit could have been mitigated by the size of the stock market. Furthermore, the signalling theory suggests that as firms take on more debt, the markets view this as a credible signal that firm managers are confident about their future cash flows. This has the effect of increasing the market value of equity relative to debt. These conjectures could provide insight into future investigations regarding this caveat.

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## APPENDIX

### SAMPLE OF FIRMS

Company Name		Classification			
		Small	Large	Internationally Financed	Domestically Financed
1	AECI LIMITED		X		X
2	ADCORP HOLDINGS LIMITED	X			X
3	AFRICAN OXYGEN LIMITED		X	X	
4	ALEX WHITE HOLDINGS LIMITED	X			X
5	ALLIED TECHNOLOGIES LIMITED		X		X
6	ALLIED ELECTRONICS CORPORATION LIMITED		X		X
7	ANGLO AMERICAN PLC		X	X	
8	ANGLOGOLD ASHANTI LIMITED		X	X	
9	ASPEN PHARMACARE HOLDINGS LIMITED				X
10	AUTOPAGE HOLDINGS LIMITED	X			X
11	AUTOQUIP GROUP LIMITED	X			X
12	AVI LIMITED		X		X
13	BARLOWORLD LIMITED		X	X	
14	BASIL READ HOLDINGS LIMITED	X			X
15	BIDVEST GROUP LIMITED				X
16	BOLTON FOOTWEAR LIMITED	X			X
17	BOUMAT LIMITED		X		X
18	BOWLER METCALF LIMITED	X			X
19	CAPE EMPOWERMENT LTD				X
20	CARGO CARRIERS LIMITED	X			X
21	CASHBUILD LIMITED	X			X
22	CEMENTATION COMPANY (AFRICA) LIMITED	X			X
23	C G SMITH LIMITED		X		X
24	CHEMICAL SERVICES LIMITED	X			X
25	CLYDE INDUSTRIAL CORPORATION LIMITED	X			X
26	COMBINED MOTOR HOLDINGS LIMITED	X			X
27	COMBINED MOTOR HOLDINGS LIMITED	X			X
28	COMPAGNIE FIN RICHEMONT		X	X	
29	CONTROL INSTRUMENTS GROUP LIMITED				X
30	CROOKES BROTHERS LIMITED		X		X
31	CULLINAN HOLDINGS LIMITED		X		X
32	DISTELL GROUP LIMITED		X		X
33	THE DON GROUP LIMITED				X
34	DORBYL LIMITED		X		X
35	EDGARS CONSOLIDATED STORES LIMITED		X		X
36	ELB GROUP LIMITED		X		X
37	ELLERINE HOLDINGS LIMITED		X	X	
38	EUREKA INDUSTRIAL LIMITED	X			X



Company Name		Classification			
		Small	Large	Internationally Financed	Domestically Financed
39	EVRAZ HIGHVELD STEEL AND VANADIUM		X	X	
40	FINTECH LIMITED	X			X
41	FOSCHINI LIMITED		X		X
42	FRAME GROUP HOLDINGS LIMITED		X		X
43	GENERAL OPTICAL LIMITED	X			X
44	GRINDROD LIMITED		X		X
45	GROUP FIVE LIMITED	X			X
46	HOSKEN CONSOLIDATED INVESTMENTS LD		X		X
47	HIGHVELD STEEL & VANADIUM CORPORATION LIMITED		X	X	
48	HUDACO INDUSTRIES LIMITED	X			X
49	HUNT LEUCHARS & HEPBURN HOLDINGS LIMITED		X		X
50	IMPERIAL HOLDINGS LIMITED		X		X
51	IMPALA PLATINUM HOLDINGS LIMITED		X	X	
52	ITALTILE LIMITED	X			X
53	JASCO ELECTRONICS HOLDINGS LIMITED	X			X
54	JD GROUP LIMITED		X		X
55	LONMIN PLC		X	X	
56	LTA LIMITED		X		X
57	MACADAMS BAKERY SUPPLIES HOLDINGS LIMITED	X			X
58	MACMED HEALTH CARE LIMITED	X			X
59	MASONITE (AFRICA) LIMITED	X			X
60	MEDI-CLINIC CORPORATION LIMITED	X			X
61	METAIR INVESTMENTS LIMITED	X			X
62	METJE & ZIEGLER LIMITED	X		X	
63	MURRAY & ROBERTS		X		X
64	NAMPAK LIMITED		X		X
65	NICTUS BEPERK	X		X	
66	NINIAN & LESTER HOLDINGS LIMITED	X			X
67	NU-WORLD HOLDINGS LIMITED				X
68	OAKFIELDS THROUGHBREDS & LEISURE INDUSTRIES	X			X
69	OCEANA GROUP LIMITED	X			X
70	OMNIA HOLDINGS LIMITED		X		X
71	PALABORA MINING COMPANY LIMITED		X		X
72	PALS HOLDINGS LIMITED	X			X
73	POWER TECHNOLOGIES LIMITED		X		X
74	RAINBOW CHICKEN LIMITED		X		X
75	REUNERT LIMITED	X			X



Company Name		Classification			
		Small	Large	Internationally Financed	Domestically Financed
76	REX TRUEFORM CLOTHING COMPANY LIMITED	X			X
77	SABMILLER PLC		X	X	
78	SABLE HOLDINGS LIMITED	X			X
79	SAFMARINE & RENNIES HOLDINGS		X		X
80	SAPPI LIMITED		X	X	
81	SASOL LIMITED		X	X	
82	SEARDEL INVESTMENT CORPORATION LIMITED		X		X
83	SHOPRITE HOLDINGS LIMITED		X	X	
84	SPESCOM LIMITED	X			X
85	SPICER HOLDINGS LIMITED	X			X
86	SUN INTERNATIONAL		X	X	
87	SUPER GROUP LIMITED				X
88	TELJOY HOLDINGS LIMITED	X			X
89	TIGER BRANDS LIMITED		X	X	
90	TOCO HOLDINGS LIMITED	X			X
91	TONGAAT-HULETT GROUP LIMITED		X	X	
92	TOYOTA SOUTH AFRICA LIMITED		X		X
93	TRANS HEX GROUP LIMITED		X	X	
94	TRANSPACO LIMITED	X			X
95	TRENCOR LIMITED		X		X
96	UNISPIN HOLDINGS LIMITED	X			X
97	UNITRANS LIMITED	X			X
98	WACO INTERNATIONAL LIMITED		X		X
99	WINHOLD LIMITED	X			X
100	YORK TIMBER HOLDINGS LIMITED	X			X

Notes: Small firms have an average value of total assets below the median and large firms have an average total asset value higher than the median. The average value of assets for each firm is calculated as the average of total assets for the years 1989 to 1994. Internationally financed firms are either cross-listed or ADR issuers and domestically financed firms are firms that are either not cross-listed or non ADR issuers.