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CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Many studies on African economies have found that African countries have failed to catch-up not only with developed economies but even with Asian and South American economies with which they were at par in the 1960s (see for example, Collier and Gunning, 1999; Sachs *et al.*, 1995; Easterly and Levine, 1997, Collier *et al.*, 2004; among others). In the early 1960s, Africa's growth potential prospects were much better than those of East Asia (Easterly and Levine, 1997). But during the period 1965–1990, real GDP per capita for East Asian countries increased by 5% per year while that in Africa never increased at all. Most African countries actually witnessed negative growth in this indicator (Easterly and Levine, 1997). One of the sectors that can help accelerate and be an engine for economic growth in Africa is the private sector¹. Thanks to privatization and other private sector-promoting initiatives in Africa, the private sector is increasingly becoming an important instrument for driving economic growth. There are however a number of problems and challenges that tend to inhibit the growth of the private sector in Africa. One of those challenges is access to finance². The aim of this study is to focus on how firms in Africa behave when it comes to raising capital.

How firms raise capital has been a subject of intense debate for quite sometime. Almost half a century has passed since Modigliani and Miller's (1958, 1963) seminal work and yet the debate on capital structure, which has overly focused on developed economies, is yet to be settled. Myers (1984: 575), who considers the capital structure problem a

¹ For example, the East Asian tigers have been placed on a higher growth trajectory, thanks to the growth in their manufacturing sector, which is dominated by the private sector. Countries like South Korea, Taiwan, Indonesia, Singapore, Malaysia and Thailand saw their manufacturing sectors growing by an average of 12% per year from 1960 to 1988 (Eifert and Ramachandran, 2004). In contrast, Sub-Saharan Africa's manufacturing sector grew by 1.9% annually during the period 1980-2002. This translates to an increase in real output by 0.5% over a period in which the population almost more than doubled.

² The results from the World Bank's Investment Climate Assessment surveys show that access to affordable finance is one of the severe problems facing African firms (see for example, Eifert and Ramachandran, 2004).

‘puzzle’, argues that ‘.... we know very little about capital structure’³. Rajan and Zingales (1995: 1421) ask ‘....what do we really know about corporate capital structure choice?’ Berens and Cuny (1995) argue that researchers continue to be puzzled by the capital structures that firms have which are not in synch with theoretical predictions. As a result, argue Rajan and Zingales (1995: 1421), “very little is known about the empirical relevance of the different theories”. This study seeks to add an African flavour to the capital structure debate and thus fill an important gap in the literature⁴. Due to the small private sector and the unavailability of reliable data, most studies on capital structure have neglected firms in Africa (see however, studies by Booth *et al.*, 2000; Green and Mutenheri, 2002; Abor and Biekpe, 2005). As a result there is dearth of literature on how firms in Africa are raising capital and why they behave as such. This study seeks to extend the debate to include developing countries especially in Africa as the debate would not be complete without the inclusion of firms found in Africa⁵.

The inclusion of several African countries for such a study provides an opportunity for comparisons among African countries as well as between African and western countries, which have been heavily studied. To the extent that African countries are similar to the western or emerging countries they provide us with independent samples to test the extant capital structure theories, and to the extent that they have different institutional structures this will increase economists’ ability to discriminate among the alternative theories and thus enable them to come up with theories that apply to the African context. Taking cognizance of the important role that banks are or should be playing in African economies the study extends the capital structure debate beyond the debt-equity divide and looks at debt choice as well. The section on debt choice seeks to compare corporate debt structure among Africa countries as well as to investigate the behavior of firms when it comes to debt choice.

³ According to Myers (1984) and Glen and Pinto (1994), even though capital structure issues are still puzzling, economists have not hesitated to proffer advice concerning capital structure.

⁴ This is especially important when one considers that the private sector is being touted as a potential driver of economic growth in developing economies.

⁵ The countries that we look at are Ghana, Kenya, Nigeria, South Africa and Zimbabwe.

The dissertation dwells on three related issues that have a bearing on how firms raise capital. We investigate the determinants of capital structure and those of corporate debt structure. The third issue is the supply of credit and the legal environment in which firms operate. We look at such an environment and assess the legal system and contract enforcement in Africa as well as the evolution of the continent's capital markets.

In order to better understand the policies that would be necessary to ensure access to capital by firms; we need to understand the behaviour of African firms when it comes to raising capital. The decision to raise capital using debt or equity depends on a number of factors. Firstly, firm characteristics play a critical role in this. For example, larger and profitable firms are expected to behave differently relative to smaller and not so profitable firms (Myers and Majluf, 1984). Secondly, the environment in which firms operate can affect their choice of debt or equity. For example, an environment characterized by information asymmetry may result in a firm choosing internal funds over debt or equity and if it needs more funds, it may choose debt over equity, as debt contracts are better at resolving information asymmetry problems. In an environment characterized by instability, short-term debt may be more accessible than long-term debt, such that even those firms that may be interested in long-term debt may fail to obtain it.

Issues such as the rule of law, macroeconomic stability, political stability, property rights and contract enforcement are also important when it comes to the choice of capital structure. For instance, instability does not only discourage investment but it also tends to foster short-termism and speculative investment by those firms that dare invest.

1.2 Research Problem

Data limitations and reliability have meant that not much is known about how the corporate sector in Africa raises capital⁶. The results of the World Bank investment climate surveys conducted in a number of African countries since the early 1990s

⁶ As a result, whilst a significant amount of effort has been expended in an attempt to understand the macroeconomic reasons why African economies have failed to catch-up, not much research effort has been expended to better understand the microeconomic reasons behind Africa's slow growth. For example, why are African firms small and why are they not growing at faster rates as witnessed in emerging markets? What problems do firms in Africa face? Why are African firms not listing on stock exchanges and yet one of their challenges is access to capital?

indicate that African firms are relatively small and are not growing as fast as they should. The survey results also indicate that one of the reasons for the slow growth of the firms is access to and cost of finance. A few studies have been conducted on the behaviour of African firms when it comes to raising capital. Those that have been done tend to concentrate on a single country (see for example, Green and Mutenheri, 2002 on Zimbabwe; Abor and Biekpe, 2005 on Ghana). Studies that do comprehensive cross-country comparisons among African countries are hard to find. More importantly, studies that investigate corporate debt structure determinants in environments bereft of public debt markets are virtually non-existent in Africa. This study seeks to fill these gaps in the literature.

The questions we seek to answer in this study include: How do firms in Africa raise capital? Are there similarities among different African countries when it comes to raising capital? Are there similarities between African and developed-country firms when it comes to raising capital? To put the capital structure debate into proper perspective we also look at institutional factors that may affect the willingness of surplus units to extend credit. Further, most studies on capital structure have overly focused on developed economies. This study aims to add Africa in the capital structure debate. It presents empirical evidence on the capital structure determinants in Africa. The study also presents an opportunity to assess the corporate sector in Africa, identify its constraints and weaknesses, and thus proffer policy advice. The last point is especially important given the realization that the corporate sector in Africa is a potential engine for economic growth.

Capital structure theories tend to assume that firms choose the capital structure they desire. That is, any value-maximizing firm should choose a capital structure that maximizes the wealth of its shareholders. The implicit assumption in such a context is that firms operate in capital markets where funds are competitively available. This is however not so in most African countries. There are many market frictions that may hinder access to some forms of capital, for example, the non-existence of public debt supply for firms. The study looks at capital markets in Africa and assesses their evolution

over time. At what stages of development are different African credit markets currently in? How have they evolved overtime?

We also assess the extent to which creditors and shareholders are protected. We compare creditor and shareholder rights among the sample countries as well as between the sample countries and other countries. This is important to demystify the general belief that African markets are a “jungle” in which investors can go at their own peril. The objectives of the study are formally articulated in the next section.

1.3 Objectives of the study

The following are the main objectives of the dissertation:

1. To investigate the determinants of capital structure in Africa by looking at the debt-equity divide. The aim here is to ascertain the determinants of capital structure by looking at the determinants of leverage for each of the sample countries, with firm characteristics as the possible explanatory factors.
2. To investigate the determinants of corporate debt structure in Africa. Given the role of banks in Africa, where equity and corporate debt markets are still in their embryonic stages of development in most countries, we want to figure out what drives the choice and amount of a given type of debt, as debt constitute the major source of external financing for African firms.
3. To assess whether the capital structure theories developed with firms in developed countries in mind are applicable to African firms. To do this, we compare results from this study with those from empirical studies conducted in emerging and developed economies.
4. To analyze developments in capital markets of the sample countries and highlight the role of capital markets in financing decisions of firms. The evolution of the capital markets shall be looked at with a view to informing policy on what can be done to improve their size, depth and efficiency.

1.4 Results and Benefits of the Study

This research helps explain how best firms in Africa can raise capital given the environment in which they operate. It helps to explain the role of capital markets (banking sector, institutional investors, bond markets and stock markets) in providing capital for firms. More importantly, given the absence of public debt for most corporations in Africa, bank loans can play a pivotal role in providing the required finance for additional investment. This research will help policy makers on how they can use policy to reduce financial constraints for firms so that they can have a wider and affordable choice of finance sources.

Extending the debate beyond the debt-equity mix is important in the context of Africa, especially given that most African countries do not have well developed stock markets or corporate public debt markets from which firms could also raise capital. This means firms are most likely to raise a significant amount of capital from internal resources and from external debt sources such as bank and non-bank private credit institutions. In developing countries, the role that the banks are playing or ought to play is significant. For example, results from the World Bank's Investment Climate surveys, conducted between 2001 and 2006, show that for Sub-Saharan African firms, 71% of new investment funds came from internal funds while banks, informal finance sources and trade credit accounted for 14%, 4% and 11%, respectively.

Given the adverse effects of information asymmetry, whose degree is acute in Africa, a better understanding of how firms are dealing with such problems when it comes to raising capital can help policy makers on how best to reduce information asymmetry's impediments to firms' ability to secure external finance. Competition in the banking sector is crucial as it helps to reduce the tendency for rent extraction by banks from the firms, and would also improve bank efficiency. This research aims to educate policy makers on the special role of banks and perhaps other intermediaries in the economy. Understanding the interaction of banks and firms as well as the strategic interaction of finance sources among themselves is crucial for policy. A bank is in a unique position as a lender (particularly in Africa) and it may use that position to extract rent from the

borrowers and this may distort the incentives of the firm such that it may exert less than optimal effort in its production activities (Rajan, 1992).

1.5 Limitations of the Study

Chapter 3 looks at the determinants of capital structure of listed firms in five African countries that have properly functioning stock markets. It would be more interesting to look at a larger number of countries, if not all African countries, with stock exchanges. Data availability and reliability permitting, further research can look at unlisted firms along-side listed ones. We however focused on non-financial listed firms mainly because most capital structure theories assume that firms have access to funds availed by the stock exchanges. Secondly, data collected on listed firms is more reliable because such firms are required by law to publish audited annual reports and financial statements. Given the small number of listed firms in some of the sample countries, the exclusion of financial firms tended to further reduce the sample sizes and thus our degrees of freedom in the analysis. To some extent, the use of panel data to complement the cross-sectional analysis helped us to increase the number of observations and hence mitigate some of the size concerns⁷.

Chapter 4, which uses data from the World Bank's Investment Climate Surveys, looks at debt choice in four of the five sample countries. Zimbabwe was dropped from this analysis because it was not covered in the World Bank's Investment Climate surveys. The analysis of corporate debt structure determination has traditionally been done using mostly data from audited annual reports and accounts of listed firms. But due to data availability problems, we used survey data for our study. The advantage is that the sample size is quite high and given that the surveys were done using a similar survey instrument in the different countries; it is possible to compare the behaviour of the firms in the different countries when it comes to debt choice. We were also able to use both listed and unlisted firms for this particular study, thus further increasing the sample size and the degrees of freedom. The disadvantage however, is that the results are not readily comparable to those from other empirical studies that exclusively used data from annual reports of listed firms. As more data becomes available, similar studies on Africa can be

⁷ The number of firms looked at falls once one excludes the financial firms.

conducted using data from annual reports, as has hitherto been traditional. The study's results are however not compromised by the use of the data from the surveys.

We are also mindful of the fact that our investigations of the determinants of capital structure are based on static theoretical models. They are in line with studies done by Titman and Wessels (1988), Rajan and Zingales (1995), Booth *et al.* (2001), Green and Mutenheri (2002), Graham (1996), Abor and Biekpe (2005), and Mackie-Mason (1990). These studies are based on the traditional view that capital structure instantaneously adjust to an optimum level (Nivorozhkin, 2005). In reality however, a firm's capital structure tends to slowly adjust to an optimum. (See for example, Frank and Goyal, 2003; Shyam-Sunder and Myers, 1999).

1.6 Organization of the study

The study is made up of five chapters. The first chapter introduces the study by giving an overview, research problems, objectives and the significance of the study. The introductory chapter is followed by three stand alone chapters that look at three related issues concerning the raising of capital by firms.

In chapter 2 the supply side of capital is looked at⁸. We, in particular, look at the financial intermediaries, stock markets and the legal systems in Africa. Banks supply a significant amount of debt to firms and the stock markets are gradually growing. It is therefore important to look at the evolution of financial systems in Africa. We look at a number of financial development indicators in the sample countries and assess whether or not there are some improvements. We also compare the financial systems across sample countries as well as with other economies.

As a complement to the supply-side analysis, we also examine the legal system environment and the extent to which creditors and shareholders are protected. This is important because if creditors and shareholders are not well protected, they are less

⁸ One shortcoming of empirical studies on capital structure is that they tend to overly emphasize firm characteristics as the main determinants of capital structure or debt structure. These theories ignore a number of factors that affect the supply of capital.

willing to extend credit to firms that are deficit-saving units. This then further reduces the external funds available to the firms, which can in turn reduce firm growth. If this problem is pervasive this may result in reduced growth of the economy as a whole. For this study of capital markets we use data from surveys done by the World Bank in its Doing Business Database, the World Bank's Investment Climate surveys, World Bank Development Indicators database, the IMF's International Financial Statistics database and the recently launched financial indicators database (also by the World Bank).

Chapter 3 looks at the theoretical and empirical determinants of capital structure. It explores the different firm characteristics and how they affect the capital raising behaviour of firms in Africa. It tests different capital structure theories using a data set on African listed firms. The theories of capital structure, from the Modigliani and Miller's (1958 and 1963) propositions to the more recent pecking order theories like Myers and Majluf (1984), are reviewed. Also reviewed are the different empirical studies conducted in developed economies, emerging economies and African economies. The theories on capital structure argue that firm characteristics are the main factors that affect the way a firm raises capital. We do the same in the empirical investigations. We test these capital structure theories using African data sets for five sample countries. The empirical results are compared across the countries in the sample as well as with other similar studies in emerging and developed economies. To add an African dimension to the debate we added some heterodox factors into the model. Examples of these include; education of principal owner of the firm, education of senior management, ethnicity of principal owner of the firm, location and whether the firm exports some of its products or not. This was done to assess the impact of those factors that are more germane to African markets.

Chapter 4 extends the capital structure debate beyond the debt-equity divide by looking at debt choice. More specifically, what firm characteristics guide a firm to use a certain mix of debts? We review the empirical and theoretical literature on debt choice as well as on lending relationships to better understand why firms choose a certain type of debt. A better understanding of how firms behave when it comes to choosing between the different kinds of debt is important in African countries; countries that are still trying to

develop their capital markets. We investigate the determinants of corporate debt structure by focusing on the impact of different firm characteristics on how firms choose between the different types of debt. The investigation starts with the choice between bank debt and non-bank debt. After determining the firm characteristics that drive the firms to choose a preponderance of a certain type of debt, we look at whether the same characteristics similarly affect the amount of debt that the firm uses to finance additional investments. This is important as it helps us to assess whether firms are managing to get the kind of debt that they prefer. From findings in this context, policy can be formulated with a view to ensuring that firms can access the debt they prefer. Chapter 5 concludes with policy recommendations and highlights of areas for further research.

CHAPTER 2

OVERVIEW OF CAPITAL MARKETS, LEGAL SYSTEMS AND INSTITUTIONAL DEVELOPMENTS IN AFRICA

2.1 Introduction

One shortcoming of most capital structure theories, to be looked at in chapters 3 and 4, is that they implicitly, and sometimes explicitly, assume that the supply of capital is infinitely elastic such that a firm's leverage, and thus its capital structure, depends solely on the firm's demand for debt (Faulkender and Petersen, 2006). As a result the capital structure empirical studies based on such theories tend to overly focus on firm characteristics as the main determinants of firm leverage and the capital structure chosen by firms (see, for example Chen, 2004; Fama and French, 1998; Bontempi, 2002; Mayer and Sussman, 2004; Frank and Goyal, 2003). In developed economies, where firms can easily access capital, this may not be a critical issue. In developing economies, especially African economies, many firms may not be able to choose an optimal capital structure since they may be credit rationed (for example see, the seminal paper by Stiglitz and Weiss, 1981). Firms in Africa face problems when it comes to accessing external funds. The supply of capital is therefore not infinitely elastic.

The purpose of this chapter is to explore the credit markets in Africa, with particular emphasis on the sample countries. We, especially, look at the evolution and changing roles of capital markets in Africa by primarily focusing on financial intermediaries and stock markets in Africa. We also look at how financial intermediaries and stock markets perform their functions given the problems inherent in African economies. Most under-developed financial systems are characterized by a high degree of information asymmetry, poor protection of minority shareholders, poor creditor rights, poor contract enforcement, poor accounting standards, macroeconomic instability and high levels of corruption (Demirguc-Kunt and Levine, 2001). It is therefore important to note that the behavior of borrowers and lenders in such an environment would be different from the way they would behave in an environment bereft of such problems. More importantly, what kind of contracts would be mutually beneficial to both lenders and borrowers in such an environment? According to Demirguc-Kunt and Levine (2001), compared to

stock markets, banks are more relevant and effective in most African economies whose financial systems are characterized by the mentioned shortcomings. Firstly, banks can induce firms to reveal information concerning their projects. This helps them to address the adverse selection problems. Once they have selected and financed good projects, banks can also efficiently monitor the projects to reduce moral hazard problems. Thus the *ex-ante* and *ex-post* opportunism behavior on the part of the borrowers are efficiently catered for by the banks. On the other hand, atomistic markets tend to rely heavily on information availability and efficient legal systems; attributes that are poor in most developing economies. Stultz (2001) compares similar projects being started in a bank-based and in a market-based system. He argues that the main worry for shareholders of the project in a market-based system is whether the project is being conducted for the benefit of management or shareholders. In a bank-based system the worry is whether the banks would focus too much on the use of cash flows generated by the firm to maintain a low credit risk for the firm. If the firm is located in an environment characterized by information asymmetry, poor creditor rights and inefficient legal systems, the project is most likely to fail to get funding if the banks do not come to the firm's rescue.

In chapter 3 it will be noted that a significant amount of debt held by listed firms in most African countries is in the form of short-term debt (see also Yartey, 2006 on Ghana and Mutenheri, 2003 on Zimbabwe, and Toby, 2005 on Nigerian firms)⁹. This is a direct result of the environment in which the firms and borrowers operate. In an environment characterized by information asymmetry and poor legal systems, banks, if they extend any credit at all, would rather issue staged finance. Future finance for a project would then depend on how the project would have evolved as well as on whether the firm has managed to pay off the debt extended earlier.

Alternatively, banks can ask for collateral before issuing loans. Collateral has the twin-effect of reducing moral hazard and adverse selection problems inherent in environments where information asymmetry is acute (Rajan and Zingales, 2003). Firstly, collateral

⁹ The result is that long-term investment projects either fail to get funding or if they do they are financed by short-term debt resulting in a funding mismatch.

requirements reduce adverse selection as they tend to give good borrowers a chance to self-select themselves into the pool of borrowers while forcing bad borrowers to self-select themselves out of the pool of borrowers, thus increasing the percentage of good borrowers in the pool of all borrowers. Once a project has been approved a borrower can decide to adopt a riskier project - hence moral hazard. Collateral requirements can reduce this since the borrower who has pledged collateral, for fear of losing the collateral, is less likely to adopt riskier projects. In this way collateral can increase the lenders' willingness to lend and thus increasing the supply of credit available to those who may have good business ideas but not the funds to finance them.

Firms that have been in existence for some time can also use the long-term relationship with the banks during which they may have established some reputation. They can use such reputation as a substitute for collateral. Stultz (2001) argues that firms that are just starting up and thus do not have the requisite collateral can enter into a partnership with a firm that has already established the requisite reputation.

The legal system, contract enforcement efficiency and protection of investors affect the extent to which lenders are willing to relinquish the control of their funds, thus affecting the supply of external funds. We look at the legal system as well as contract enforcement efficiency in the sample countries. We look at issues such as the rule of law, property rights, legal rights and the justice system in general with a view to providing a snapshot of some institutional factors that affect investors' confidence as well as the willingness of lenders to lend. This, we feel, is critically important for this study as it helps us to better understand the environment in which firms are raising capital.

The type of finance available to firms in developed countries is different from that available to firms in African economies. This is primarily because the firms exist in economies that are at different developmental stages. For example, most African economies do not have bond markets and where they exist they are still in embryonic stages of development and almost exclusively for government treasuries. According to Boyd and Smith (1996), at an early stage of economic development, entrepreneurs

essentially depend on their savings if they need funds for investment (see Table 4.1 on the sources of funds for new investments). As the economy develops, banks emerge to facilitate the financing of new investments. Further growth in the economy ushers in the development of markets for tradable securities. Such markets do not replace but complement banks (Demirguc-Kunt and Levine, 1996). Because of the inherent complementarity between banks and stock or debt markets we do not intend to delve into the debate on whether African economies should be bank-based or market-based (see Levine, 2002 for a discussion on this).

Given that capital markets in Africa are underdeveloped most private firms are forced to rely largely on internal funds for investment financing. This is hardly enough to push the African economies from the poverty trap that most find themselves in¹⁰. In most African economies it is not uncommon to have several entrepreneurs with good ideas but without funds to finance their projects – sometimes forcing them to spend a long time accumulating savings for a project. Consequently, access to finance becomes a huge barrier to entry for new entrepreneurs such that only a few incumbents can embark on huge projects (World Bank African Region, 2006; Rajan and Zingales, 2003). The delay in the implementation of the projects may actually see the idea being over-taken by technology such that when the funds are eventually raised the project may no longer be viable. According to Rajan and Zingales (2003), such a scenario is not common in economies with well developed financial systems.

Table 2.1 shows that firms in Sub-Saharan Africa depend heavily on internal funds. It shows that, on average, the firms raise more than 71% of their new investment funds from internal funds while only about 15% comes from bank loans; with the remaining impliedly coming from non-bank credit sources and external equity sources. In 2001, firms in Mozambique raised 83.3% of their funds from internal sources while only 12.9% of the funds came from banks. In Mali about 85% of the total funds for new investments came from internal funds and about 12% came from banks. This is quite high when

¹⁰ This is exacerbated by the fact that a significant amount of African resources leave the continent via capital flight (see for example Ndikumana and Boyce, 2002).

compared to about 34% for East Asia and Pacific countries, 60% for OECD countries and 68% for Latin America and Caribbean countries.

When one looks at external sources of funds it is clear that banks are the dominant source of external finance. This clearly highlights the critical role of corporate debt markets as a source of external financing for African companies.

Table 2.1: Sources of Funds for New Investment

Country	Internal Finance for Investment	Bank Finance for Investment	Informal Finance for Investment
Algeria (2002)	74.25	16.28	3.96
Botswana (2006)	75.54	11.4	3.06
Cameroon (2006)	67.88	12.39	6.35
Egypt (2004)	86.15	6.93	0.9
Eritrea (2002)	63.08	30.5	0.58
Ethiopia (2002)	69.78	21.24	5.05
Kenya (2003)	52.66	32.4	1.52
Lesotho (2003)	67.86	9.29	11.55
Malawi (2005)	60.76	22.83	3.99
Mozambique (2001)	83.30	12.90	..
Mali (2003)	84.75	11.68	1.82
Mauritius (2005)	48.74	33.63	1.17
Namibia (2006)	73.05	14.24	1.14
Senegal (2003)	70.47	18.44	3.82
South Africa (2003)	58.45	16.53	1.06
Swaziland (2006)	74.28	8.54	4.32
Tanzania (2003)	67.95	16.34	3.7
Zambia (2002)	57.74	17.47	2.89
East Asia and Pacific	33.81	23.85	11.58
Europe & Central Asia	70.6	10.26	4.74
Latin America & Caribbean	54.67	21.15	4.2
Middle East & North Africa	68.3	16.51	3.97
OECD	60.26	20.03	1.47
South Asia	56.41	19.79	6.74
Sub-Saharan Africa	71.17	15.06	4.52

Source: World Bank Investment Climate Survey (as sourced from the website: www.enterprisesurveys.org)

The year in brackets is the year during which the World Bank Investment Climate Assessment survey was conducted.

This chapter is made up three main sections. The first section looks at the functions of financial intermediaries and organized stock markets. The second section looks at the evolution of financial intermediaries in Africa. The third section looks at the legal system and contract enforcement in Africa.

2.2 Financial Systems in Africa

The importance of a properly functioning and efficient financial system cannot be overemphasized. By mobilizing savings, facilitating portfolio diversification, transferring

resources across time and space, and by enabling borrowers to overcome financing constraints, financial intermediaries play a very important role in increasing investment levels and thus stimulating economic growth (Ndikumana, 2001; Levine, 2004).

While most financial systems in Africa are still underdeveloped and have a narrow range of financial institutions, efforts are being made to improve them and most have experienced rapid financial deepening. For example, a number of countries have and others are liberalizing their financial systems and such systems are getting more and more diversified and are offering their clients better services. Most of this is due to better technology and increased private ownership. In the 1980s most banks were owned by governments and financial repression was the order of the day. According to Brink and Viviers (2003), several countries in Africa are in the process of developing and reforming their financial sectors. Such countries include Angola which is conducting some banking sector reforms; Malawi and Mauritius where financial sector liberalizations are now at advanced stages. Mozambique is also conducting a financial sector adjustment programme. Since 2004 Ghana has experienced rapid financial deepening thanks to structural reforms and the liberalization of the sector (IMF, 2007). Competition among banks in the sample countries has also been increasing. South Africa has the most developed financial system in the continent and as South African firms continue their expansion into other African countries this has seen a number of South African-based banks expanding their operations into a number of African countries¹¹. Undoubtedly, this can increase the speed of financial development in these other countries.

After gaining independence most African countries experimented with various heterodox development policies. Most of the policies implied a number of controls on the financial sector. Such controls included restrictions on potential local and international entrants, directed lending, interest rate controls, and state ownership of banks. Because of such controls and ownership structures it was easy for the governments to, through directed lending, channel funds to so-called priority sectors. All these measures tended to hurt the

¹¹ For example, as of 2005, Stanbic had operations in 16 SSA countries, ABSA had operations in 5 African countries and Nedbank had 4 (IMF, 2006). Stanbic, ABSA and Nedbank are South African-based banks.

financial system development process and thus the economic performance of many African countries. According to the World Bank (2005b), removing such impediments to competition and other government restrictions brought about banking stability in a number of developing economies, reduced interest rate margins and expanded access to finance, especially to the hitherto starved private sector.

2.3 Functions of financial intermediaries and stock markets

The financial system performs a number of critical functions in an economy. Levine (1997) provides a summary of such functions. The main functions performed by the financial system includes facilitating trading of risk, allocating capital or resources, monitoring managers and exerting corporate control, mobilizing savings and easing the trading of goods, services and financial contracts.

In this section the main functions of financial systems are presented. More importantly, we analyze the extent to which these functions are performed by banks and stock markets. This is in recognition of the fact that some of the functions are better performed by banks whilst others are better performed by stock markets. Others are better performed by banks and stock markets complimenting each other.

The first function of a financial system is creating liquidity. In most cases there is a mismatch in the markets in the sense that savers are not keen to relinquish the control of their savings for a long time. At the same time investors have projects that require long-term capital commitments (Levine, 1996, 1997). Without financial intermediaries or stock markets such a mismatch can adversely affect investment and ultimately economic growth, as such investment projects can fail to attract sufficient funds. For example, stock markets help ameliorate this problem by allowing savers to buy shares and thus providing the required funds. The important role played by the stock markets is that if an investor wants to sell equity this can be quickly done in a liquid market. Thus when savers want to use their money they can liquidate their shares and get the money back. According to Levine (1997) investors “come if they can leave”. The shares are simply changing hands in a secondary market and so this does not affect long-term investments by the firms. Thus stock markets provide a more permanent source of external funds. Liquid markets

enable the financing of illiquid projects (Levine, 1997; Shirai, 2004). According to Levine (1997), market liquidity is a critical ingredient that spurred growth during England's industrial revolution. The industrial revolution would not have been successful without liquid capital markets that facilitated the transfer of liquid financial instruments into long-term capital investments. So by facilitating long-term investments liquid markets facilitate the efficient allocation of capital. In this context a stock market tends to play a better role than financial intermediaries since most banks tend to offer short-term loans. This is especially evident in most African countries which are characterized by macroeconomic and political instabilities which tend to further shorten the terms of bank loans.

Venture capital investments are more attractive in economies that have well functioning stock markets (Rousseau and Wachtel, 2000). Venture capitalists need the option to exit and this can be provided by equity markets. In the presence of equity markets, venture capitalist can easily realize the gains from a project by exiting when the company makes an initial public offering. According to Rousseau and Wachtel the availability of such an exit option makes venture capital investments more attractive and can increase investment and ultimately growth.

The second important function of financial systems is that of pooling savings. This can be performed by both the financial intermediaries and the stock markets. Banks pool savings from surplus savings units and supply the resources to deficit units who want to invest. In the latter case, we have direct funding as investors approach surplus units and acquire funds by selling financial instruments like shares or bonds. In the absence of financial systems that pool resources production activities would be constrained to inefficient levels (Levine, 1997). Pooling of resources implies that individual investors, instead of saving for a long period to buy or start a firm, can easily become part-owners of firms. Firms can, for example, use stock exchanges to raise finance for new investment (Jefferis, 1995). Equity markets tend to perform some functions which cannot be similarly replicated by banks (Shirai, 2004; Demigurc-Kunt and Maksimovic, 1995). For example, firms do not have to issue dividends if circumstances are difficult. But a firm that fails to

service its debt may be forced to go bankrupt (Shirai, 2004). According to Beck and Levine (2002), banks play the important role of reducing information frictions and thus facilitate resource allocation. Demigurre-Kunt and Maksimovic (1996), using a sample of 30 countries for the period 1980-1991, investigated the impact of financial market development and found that development of financial markets leads to a substitution of equity for debt financing. They also argue that, given the different attributes of debt and equity, stock markets and banks play different but complementary roles. Stiglitz (1985) argues that banks are better than stock markets when it comes to resource allocation and corporate governance. For example, banks more efficiently monitor firms after funds have been provided while the markets would more efficiently address the problem of imperfect knowledge about the quality of projects available to borrowers (Deidda and Fattouh, 2006).

Beck and Levine (2002) proffer a counter argument that stock markets reduce the inefficient monopoly power that banks may have if stock markets were absent. In the absence of stock markets, banks may take a conservative approach such that financial innovation would be lower than would have been the case in the presence of stock markets. According to Beck and Levine, theory is yet to settle the issue concerning whether stock markets and banks are substitutes or compliments as well as whether one is more effective in promoting growth than the other.

One important distinction between bank finance and market-based finance is that banks are usually reluctant to offer long-term finance. This may force firms to concentrate on projects with short gestation periods, neglecting projects that require long-term capital commitments (Jefferis, 1995). By filling this gap, stock markets can play a pivotal role in spurring economic growth. More importantly, stock markets can facilitate the efficient allocation of savings. This is especially important in the context of African economies where governments tend to allocate credit to so-called priority sectors. Such directed lending is usually fraught with problems, including corruption and inefficient allocation as funds may be allocated to sectors or projects that do not yield the highest social returns.

An important empirical question related to the above-mentioned function of the stock market is whether the growth of stock markets in developing economies has resulted in the growth of total savings. It is possible that people reduce their bank deposits and use them to purchase tradable securities (Singh, 1997). In such a case the banks and stock markets may just be competing for the same level of savings¹². Rousseau and Wachtel (2000) argue that there is no empirical evidence that support the notion that the existence of equity markets reduces the supply of savings.

The third important function of financial intermediaries and stock markets is that they facilitate information acquisition. In any market, economic agents that get information earlier than other agents can use that information to their advantage. More liquid stock markets can create incentives for investors to try and gather such information and conduct research on firms of interest. Such information can improve resource allocation and spur economic growth (Levine, 1996, 1997). The idea is that investors that have better information about listed firms can make more informed decisions in terms of trading the securities. They can therefore gain from that before the information is made available to other investors (Note that this implies “first recipient advantage” and not speaking of insider trading, which is both illegal and efficiency-reducing). So there is an incentive for stockholders to research on the firms and get more information. Such an informational role implies that the market can aggregate information about the prospects of listed firms, convey such information to the public, thereby facilitating the monitoring of the firm. The smooth flow of information from management to creditors and investors ensures that the market manages to produce a market valuation of any developments affecting the firm (Rousseau and Wachtel, 2000). Such a function may not be effectively rendered by financial intermediaries.

Stiglitz (1985) however argues that the availability of information may discourage investors from collecting data and doing research on firms of interest. Shirai (2004) and Demigurc-Kunt and Maksimovic (1996) argue that stock markets can also facilitate the

¹² The competition between banks and stock markets is also very important in African countries where the banking industry is sub-optimally operating, as it is either controlled by the government or it is oligopolistic (Jefferis, 1995).

burgeoning of research firms that collect and produce information on firms. Such information can then be forwarded to interested investors at a cost. By facilitating the synchronization of shareholders' and managers' interests, stock markets provide a credible tool for corporate governance (Shirai, 2004). Such a tool can ensure that past investments are profitably used (Singh, 1997). Singh however posits that the monitoring, screening and disciplinary functions of the stock market must not be over emphasized. For example, corporate control tends to occur more on the basis of size rather on the basis of firm performance such that a large unprofitable firm is less likely to be taken over as compared to a small efficient firm. Banks can also help in monitoring the management of firms by either becoming part-owners of the firms or by establishing a long-term relationship with the firms involved.

Stock markets can also help in the synchronization of the interests of management and owners of the firm. This can be done by giving the management some share options, for example. If the firm performs well its stock price rises. This is beneficial to both managers and shareholders of firms.

In the context of Africa and other emerging markets, the stock markets in particular, have been used to facilitate privatization. Privatization in the presence of a well developed stock market is much easier and allows the participation of the general population¹³. According to Jefferis (1995), privatization can also be used by African governments to kick-start stock markets. Over and above allowing local investors to own parastatals, stock markets can also allow them to be part-owners of listed multinational firms.

Stock markets can be used as conduits of foreign direct investment from developed economies. It has been found that the correlation between stock markets in Africa and those in developed economies is very low (Kenny and Moss, 1998). This implies that investors in developed economies can diversify their portfolios by investing in African stock markets. For example, the Zimbabwe Stock Exchange was found to be highly

¹³ According to Irving (2005), in November 2001, the government of Mozambique issued 30% of the stake in Cerveja de Mozambique on the stock exchange.

independent of the Dow Jones Industrial Average, with a correlation of 0.03. It must also be noted that such investment can facilitate the establishment of financial reporting standards (Jefferis, 1995). Listing on stock exchanges requires the adoption of internationally acceptable accounting standards and the frequent publication of financial statements. Such standards and disclosure do not only help the foreign investors but also domestic investors. Listing on stock exchanges also helps firms get credit ratings from reputable rating agencies in the world, thus enabling firms to access finance from more investors. Such foreign direct investment (FDI) inflows also help in increasing African countries' foreign exchange reserves, thus reducing their hitherto dependence on the sale of primary products for foreign currency generation. However, FDI and portfolio flows tend to be attracted by economies that have properly functioning equity markets (Rousseau and Wachtel, 2000).

To some extent, the stock exchanges have also been used by African governments to send some signal to potential donors and other international investors that they are serious about the development of the private sector. According to Kenny and Moss (1998), the stock market can thus be perceived as an instrument of economic reform in Africa.

In some cases the stock markets have also been used as prestige symbols. Kenny and Moss (1998: 831) state that:

'It could even be argued that stock exchanges are the latest prestige project that every country must have – a symbol of international legitimacy akin to national airlines a generation ago'.

Singh (1999) argued that a number of African countries were developing stock exchanges even when their private sectors were weak and still in their embryonic stages of development. For example, Mozambique rushed to establish its stock exchange in 1999 even though the donors, Lisbon Stock Exchange and the World Bank, who were helping the government to establish the exchange, were of the view that it was too early for

Mozambique to establish the exchange given its economy then as well as its private sector (Kenny and Moss, 1998).

The stock markets however do have their pitfalls. According to Diamond (1984), banks can perform a better job when it comes to reducing information asymmetry as compared to stock exchanges. Information asymmetry, which is very high in African economies, creates adverse selection problems in markets such that potential investors may fail to distinguish high-quality from low-quality firms (Akerlof, 1970 and Levine, 1997). The result is that investors may offer a price that reflects an average value of the firm issuing securities and such an average would only be attractive to low-quality firms and not high-quality ones (Levine, 1997 and Akerlof, 1970). Consequently, the high quality firms would not want to issue securities at the going prices. Such a problem would be more acute in most African economies where the degree of information asymmetry is high. Moreover, in security markets such as bond markets, it is difficult to renegotiate for the extension of a loan if a firm is going through a bad patch. This can be done with relative ease with financial intermediaries, for example. So financial intermediaries can play the role of financing firms in cases where the stock market may not efficiently do so¹⁴.

The two can also compliment each other (Levine and Zervos, 1995). Indeed equity and debt financing are not perfect substitutes (Demirguc-Kunt and Maksimovic, 1996). According to (Cho, 1986) efficient resource allocation can be achieved if credit markets are supplemented by equity markets. Singh (1997) goes on to argue that it is imperative that the two (debt and stock markets) are efficient. If they are inefficient it is possible to have credit rationing as per Stiglitz's (1984) framework.

It was earlier on explained that increased liquidity has some positive effects on economic growth. Increased liquidity can also hurt economic growth (Levine, 1996; Singh, 1999). According to Levine, liquidity by adversely affecting corporate governance, may negatively affect growth. Highly liquid markets allow disgruntled shareholders to quickly

¹⁴ Atje and Jovanovic (1993) found that stock markets have the effect of increasing economic growth by as much as 2.55 and that banks have little influence.

sell their shares. This can weaken investors' commitment to the firm whose shares they hold (Singh, 1999). The shareholders may lack sufficient incentives to diligently monitor management. This may hurt economic growth as management, knowing that disgruntled shareholders can simply "pack and go", may feel insufficiently motivated to run the firm efficiently. Shareholders may also fail to monitor the firm because of the possibility of free-riding. This is because if one shareholder exerts some effort in terms of monitoring the management the benefits of such monitoring also accrue to the shareholders who are not monitoring. As a result all shareholders may not monitor. Singh (1997) argues that the instant liquidity provided by stock markets may not necessarily be a virtue because such instant liquidity could imply that investors need not have a long-term commitment to the firm. Stock markets, therefore, tend to "foster an environment of short-termism in which immediate financial gain is preferred to long-term enterprise" (Singh, 1999: 345).

Most stock markets are characterized by high volatility, which has repercussions on the economy. High volatility can undermine the financial system by making the share prices loose their appeal as a guide to resource allocation and also discourages firms from listing on stock exchanges (Singh, 1997; Pagano, 1993). Demirguc-Kunt and Levine (1996) however found that stock markets that are large and internationally integrated tend to be less volatile.

2.4 Financial intermediaries in Africa

The purpose of this section is to assess the size and evolution of financial intermediaries in Africa, with particular emphasis on the sample countries. The financial intermediaries of interest include: central banks, banks (i.e., commercial banks, merchant banks, savings banks, etc.) and other non-bank financial intermediaries. In order to better understand the size of the financial systems in the sample countries we look at their market size, efficiency and overall activities. Different indicators of financial development are examined because each indicator tends to have some statistical and conceptual weaknesses. Using different measures provides a clearer picture of financial intermediary development than would any one indicator (Demirguc-Kunt and Levine, 1996). The indicators that we use to assess the size and efficiency of the financial intermediaries include: the number of bank branches per 100 000 people, ratio of private credit to GDP,

ratio of liquid liabilities of financial intermediaries to GDP, ratio of deposit money bank assets to GDP, ratio of central bank assets to GDP, net interest rate margin, overhead costs and bank concentration.

The data utilized in this chapter come from the World Bank's database on the financial development and structure (see Beck *et al.* (2000) who describes the dataset)¹⁵. The World Bank Development Indicators and International Monetary Fund's International Finance Statistics (IFS) online databases are also used.

Bank Branches. We use the number of bank branches per 100 000 people to measure the banking system's network and thus availability of financial services to the generality of the population. A financial system with a high figure is more developed than one with less¹⁶. Access to financial services in the sample countries remains low. In 2004, bank branches per 100 000 people were 3.27, 5.99, 1.62, 1.38 and 1.60 for Zimbabwe, South Africa, Nigeria, Kenya and Ghana, respectively. As shown in Table 2.2 the world's average was 9.81 and the high income countries' average was 33.03. This shows that access to financial services in South Africa is quite high as compared to other sample countries but remains low when compared to the world average of 9.81. So acute is access to financial services that in Ghana only 5% of its population has access to banks accounts and in SSA only 20% of the adult population has access to bank accounts (IMF, 2007). According to the Reserve Bank of Zimbabwe (2007), in Zimbabwe almost 89% of the bank branches are located in urban areas where just 35% of the population reside while only 11% of the branches are located in rural areas where 65% of the population reside.

¹⁵ The database, which covers a significant number of countries, is being continuously updated. The one we used covers the period 1960-2005. There are however a number of gaps in the series especially for Africa countries.

¹⁶ It must, however, be noted that there have been a number of innovations in the financial systems worldwide that have improved the efficiency of the banking system. Such innovations include automated teller machines, telephone banking, debit cards, internet banking, banking via mobile phone, among others (Hawkins, 2004).

Table 2.2: Bank branches (per 100,000 people) in 2004

Country	Bank branches (per 100,000 people)
Zimbabwe	3.27
South Africa	5.99
Nigeria	1.62
Kenya	1.38
Ghana	1.60
High income countries	33.03
World	9.81

Source: World Development Indicators

Table 2.3, adopted from Brink and Viviers (2003), shows the distribution of different financial institutions in a number of African countries. The table indicates that a number of countries have privatized some formerly government-owned banks. In terms of diversification of the financial systems it can be seen that South Africa (with 120 commercial banks and other institutions such as bond and futures exchanges) has the most diversified financial system in sub-Saharan Africa to the extent that it is tempting to drop South Africa from the sample as it is an outlier. We however feel that it is important include South Africa not only because other chapters have included it but also due to the fact that the growth of the South African financial system has a bearing on other African countries. This is especially important given that a number of South African-based banks and other non-financial firms have operations in a number of African countries (see section 2.2 in this chapter).

Table 2.3: Financial Institutions in Africa

Country	Banks	Other Financial Institutions
Angola (as of 2001)	2 state owned commercial banks, 3 Portuguese banks	21 exchange bureaus, one privately owned investment bank
Botswana (as of 2001)	4 commercial banks	2 development banks, 1 investment bank, 1 asset management company, one savings bank, one finance and leasing company, one stock broking firm, one company and 4 parastatals that are allowed to directly deal with the central bank, 10 insurance companies, 14 insurance brokers, 40 insurance agencies.
Ghana (as of 2001)	7 commercial banks, 123 rural banks catering for the rural dwellers, 6 merchant banks	21 registered insurance and reinsurance companies, 3 development banks.
Malawi (as of 2001)	5 commercial banks, 3 saving institutions (governments owns two largest commercial banks through indirect and direct shareholdings)	4 development institutions, one building society, ten insurance companies, one discount house, one stockbroker, 4 finance houses and merchant banks.
Mozambique (as of 2001)	10 commercial banks,	6 insurance companies, one leasing company, 4 credit cooperatives, 27 exchange bureaus, 1 investment bank
Namibia (as of 2001)	6 commercial banks, post office savings banks, agricultural bank	National housing enterprise, insurance companies and pension funds
Nigeria (as of 2003)	89 commercial banks	187 insurance companies (as of 1996), 33 merchant banks, 278 savings banks, 194 mortgage institutions.
Kenya (as of 2002)	44 commercial banks, 4 building societies, 1 Post Office Savings Bank, 2 mortgage finance companies.	37 insurance companies, 7 development finance companies, savings and credit unions, 48 exchange bureaus
South Africa	120 banks (none of the banks are state owned)	Stockbrokerage firms, money market brokerage firms, bond exchange, full spectrum of other non-bank financial institutions such as insurance companies, pension funds, unit trusts and participation bonds. It also has a futures exchange
Swaziland	3 commercial banks, 1 development and savings bank, 1 building society	Stockbrokers, 1 unit trust
Zambia (as of 2003)	15 commercial banks (government owns one of the banks)	3 brokerage firms, 2 venture capital funds, 4 composite Insurance companies, 1 life insurance company, 3 non life insurance companies, 1 reinsurance company, pension funds, licensed dealers
Zimbabwe (as of 30 April 2005)	12 commercial banks, 4 merchant banks, 3 building societies, 4 finance houses	26 licensed asset management companies, mutual funds, leasing companies, 133 licensed microfinance institutions, 5 discount houses,

Source: Reserve Bank of Zimbabwe (2005), Brink and Viviers (2003), Mitchell (2001), Government of Zambia (2004), Madison Insurance Zambia (2005), IMF (2003)

Financial system size. To measure the overall size of the financial system we use four main indicators: the ratio of liquid liabilities of financial intermediaries to GDP, the ratio of private credit to GDP, the ratio of central bank assets to GDP and the ratio of deposit money bank assets to GDP. The ratio of liquid liabilities to GDP is a broad measure of

monetary resources mobilized by financial institutions. The ratio of private credit to GDP measures the extent to which financial institutions are channeling savings to productive use; that is, the extent to which funds from surplus savings economic units are being intermediated into the private sector (World Bank, 2006a). It can also be used to gauge the depth of the banking system. The ratio of central bank assets to GDP and the ratio of deposit money bank assets to GDP are used to measure the size of the different sectors of the banking system.

Each indicator has its own shortcomings hence the use of a number of them¹⁷. For example, the ratio of liquid liabilities to GDP measures the size of the financial system but fails to measure the extent to which banks are intermediating. The ratio of private credit to GDP better assesses the extent to which banks are channeling funds to the private sector. The indicator is however, a quantitative measure which is silent on the quality of loans issued as it includes non-performing loans as well.

The ratio of liquid liabilities to GDP is equal to M3 money supply divided by GDP. Where M3 is the broad definition of money (see, for example Demiguc-Kunt and Levine, 1996; and King and Levine, 1993 who also used the same indicator). The ratio of private credit to GDP is equal to the amount of credit extended to the private sector by the financial intermediaries divided by the GDP. While this measure is supposed to exclude credit issued to public enterprises and governments, and thus measure the extent to which financial intermediaries are channeling savings to the private sector deficit units, Demirguc-Kunt and Levine (1996) argue that it is not uncommon for a number of countries to also include the credit to governments in this figure. Thus this indicator must be cautiously interpreted as it may overstate the true picture. The indicator excludes any cross-claims that arise when banks lend to each other (Beck *et. al.*, 2000).

Table 2.4 shows the ratio of domestic credit to the private sector as a percentage of GDP. The sample countries' financial systems are at different stages of development. For example, in 1980 South Africa's ratio of domestic credit to the private sector to GDP was

¹⁷ See for example, Fry (1995) for a detailed description of these measures.

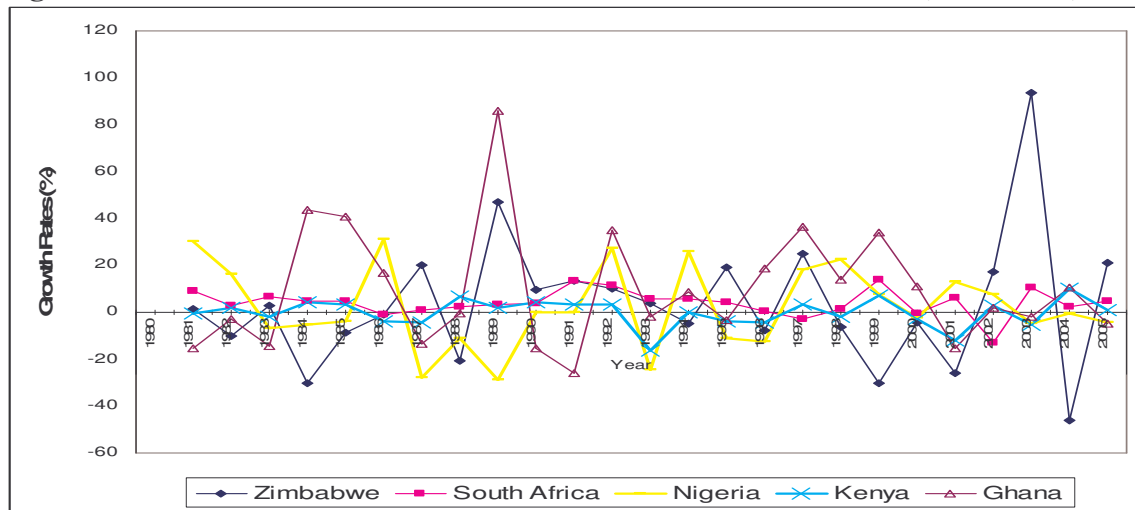
almost twice that of Zimbabwe and Kenya, four times that of Nigeria and more than 25 times that of Ghana, suggesting that higher income countries tend to have deeper financial systems. By 2004, the gap between South Africa, on one hand, and Zimbabwe, Kenya and Nigeria, on the other, had widened. South Africa's domestic credit as a percentage of GDP in 2004 was more than 6 times that of Zimbabwe, more than 8 times that of Nigeria, more than 5 times that of Kenya and more than 10 times that of Ghana. All countries, with the exception of Kenya, however, saw an increase in this indicator between 1980 and 2005, implying that there was an improvement in financial intermediation. Between 1980 and 2004, the average annual growth rates of credit extended to the private sector as a percentage of GDP for Zimbabwe, South Africa, Nigeria, Kenya and Ghana were 3.54%, 4.10, 2.26, -0.18 and 9.70, respectively (see Figure 2.1). This implies that Ghana experienced the largest growth in domestic credit extended to the private sector as a percentage of GDP.

Table 2.4: Domestic Credit to the Private Sector (% of GDP)

Year	Zimbabwe	South Africa	Nigeria	Kenya	Ghana
1980	25.48	55.64	12.23	29.48	2.19
1981	25.82	60.70	15.93	29.40	1.85
1982	23.24	62.58	18.51	29.99	1.80
1983	23.86	66.87	17.25	29.35	1.54
1984	16.61	69.93	16.34	30.55	2.21
1985	15.17	73.40	15.68	31.53	3.11
1986	15.01	72.77	20.54	30.26	3.63
1987	18.02	73.41	14.84	28.95	3.15
1988	14.30	75.28	13.18	30.83	3.14
1989	21.00	77.85	9.39	31.38	5.84
1990	23.04	80.95	9.41	32.67	4.93
1991	26.17	..	9.43	33.75	3.66
1992	28.77	102.45	12.03	34.84	4.94
1993	29.84	108.17	9.11	29.21	4.84
1994	28.41	114.26	11.49	29.27	5.25
1995	33.84	119.34	10.20	..	5.07
1996	31.23	119.87	8.93	26.97	6.01
1997	39.06	116.24	10.57	27.94	8.20
1998	36.63	118.15	12.94	27.34	9.36
1999	25.63	134.44	13.95	29.26	12.56
2000	24.51	133.73	13.61	28.43	13.97
2001	18.17	141.95	15.37	25.08	11.85
2002	21.30	123.77	16.56	25.78	12.05
2003	41.28	136.74	15.73	24.38	11.84
2004	22.28	140.06	15.63	26.80	13.08
2005	27.01	146.81	14.93	27.03	..
Average (1980-2005)	25.22	101.01	13.61	21.22	6.24

Source: World Development Indicators

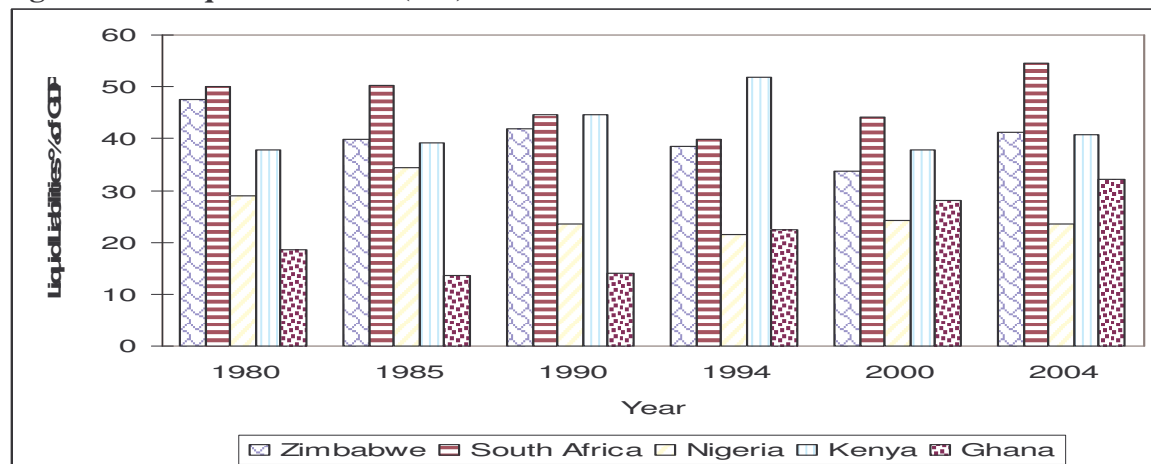
Figure 2.1: Growth Rates of Domestic Credit to the Private Sector (% of GDP)



Source: World Development Indicators

Figure 2.2 shows that, in 1980, Zimbabwe and South Africa had liquid liabilities as a percentage of GDP that were above 40%. Kenya and Nigeria's were between 30% and 40% while Ghana's was less than 20%. By 2004, South Africa's had surged to more than 50% while Zimbabwe's declined somewhat to around 40%. Ghana's increased to more than 30% while Kenya and Nigeria's remained more or less constant.

Figure 2.2: Liquid liabilities (M3) as % of GDP



Source: World Development Indicators

To measure the sizes of central and commercial banks we use the ratio of the central bank total assets to GDP and the ratio of total assets of deposit money banks to GDP, respectively. Table 2.5 shows the ratio of central bank assets to GDP for the sample countries. In 1995 Nigeria, at 0.203, had the largest central bank assets to GDP ratio and

South Africa, at 0.029, had the lowest. In 2005 Zimbabwe's was the highest at 0.306 and South Africa had the lowest at 0.010. The table indicates that, for most countries, there was a general decline in this indicator. For example, in 1995 Kenya's ratio was 0.165 but by 2005 the ratio had declined to 0.040, implying that the 1995's ratio was more than 4 times that of 2005. Nigeria's ratio declined by more than 500% during the same period. Ghana and South Africa's declined by about 27% and 190%, respectively. Zimbabwe's was 0.172 in 1995, peaked to 0.277 in 1998 before falling to 0.129 in 2001 and by 2005 the ratio had increased to 0.306.

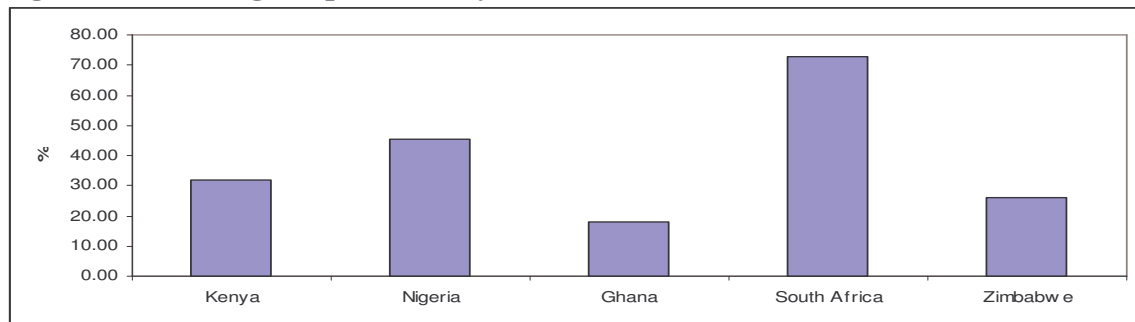
Table 2.5: Central Bank Assets / GDP Ratio

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Kenya	0.165	0.118	0.071	0.056	0.048	0.041	0.038	0.040	0.039	0.037	0.040
Nigeria	0.203	0.144	0.125	0.152	0.150	0.108	0.132	0.117	0.076	0.060	0.033
Ghana	0.175	0.149	0.142	0.382	0.657	0.729	0.398	0.330	0.338	0.129	0.137
South Africa	0.029	0.025	0.025	0.020	0.015	0.012	0.010	0.011	0.014	0.013	0.010
Zimbabwe	0.172	0.219	0.271	0.277	0.256	0.253	0.129	0.179	0.177	0.190	0.306

Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000)¹⁸.

Figure 2.3 shows that South Africa had the highest ratio of deposit money bank assets to GDP for the period 1995-2005. Ghana had the lowest ratio. South Africa's ratio was almost three times that of Zimbabwe, twice that of Kenya, four times that of Ghana and one and half times that of Nigeria, indicating a huge difference between the size of the South African banking system and that of the other sample countries.

Figure 2.3: Average Deposit Money Bank Assets (% of GDP) (1995-2005)



Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000)¹⁹.

¹⁸ The dataset was established in 2000 by the World Bank's Finance and Private Sector Research programme. The data set we used was updated in 2006.

Banking sector efficiency. The core function of banks is to transfer funds from surplus to deficit units. Bank efficiency measures the extent to which banks perform this primary function. We measure the efficiency of commercial banks using three indicators: the net interest margin, the overhead costs ratio, and return on assets. Net interest margin is equal to the value of a bank's net interest revenue divided by the bank's total assets (Beck, Demigurc-Kunt and Levine, 2000). The overhead costs ratio is equal to the value of a bank's overhead costs divided by the bank's total assets. The ratios are constructed as averages across all banks per country in a given year.

Table 2.6: Net Interest Margin

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average (1995-2005)
Sample Countries												
Kenya	0.069	0.058	0.067	0.076	0.081	0.076	0.083	0.083	0.069	0.068	0.074	0.073
Nigeria	0.073	0.068	0.081	0.088	0.078	0.085	0.109	0.104	0.092	0.087	0.064	0.087
Ghana	0.090	0.076	0.12	0.134	0.101	0.095	0.098	0.08	0.113	0.103	0.095	0.101
South Africa	0.058	0.076	0.072	0.072	0.066	0.063	0.06	0.062	0.08	0.068	0.069	0.068
Zimbabwe	0.050	0.046	0.05	0.088	0.146	0.185	0.175	0.137	0.245	0.454	..	0.158
Average	0.068	0.065	0.078	0.092	0.094	0.101	0.105	0.093	0.120	0.156	0.076	0.097
Emerging economies												
Taiwan	0.026	0.024	0.023	0.023	0.024	0.024	0.022	0.024	0.022	0.022	0.019	0.023
Korea Rep.	0.029	0.03	0.026	0.023	0.022	0.023	0.023	0.025	0.027	0.031	0.030	0.026
Malaysia	0.029	0.03	0.03	0.037	0.029	0.028	0.026	0.025	0.024	0.024	0.022	0.028
Average	0.028	0.028	0.026	0.028	0.025	0.025	0.024	0.025	0.024	0.026	0.024	0.026
Developed economies												
UK	0.021	0.023	0.024	0.028	0.031	0.033	0.025	0.023	0.026	0.026	0.024	0.026
USA	0.044	0.043	0.045	0.043	0.042	0.042	0.04	0.041	0.04	0.04	0.04	0.042
Japan	0.021	0.021	0.020	0.020	0.020	0.018	0.019	0.018	0.017	0.017	0.017	0.019
France	0.033	0.033	0.030	0.032	0.030	0.030	0.030	0.029	0.026	0.025	0.031	0.030
Average	0.030	0.030	0.030	0.031	0.031	0.031	0.029	0.028	0.027	0.027	0.028	0.029

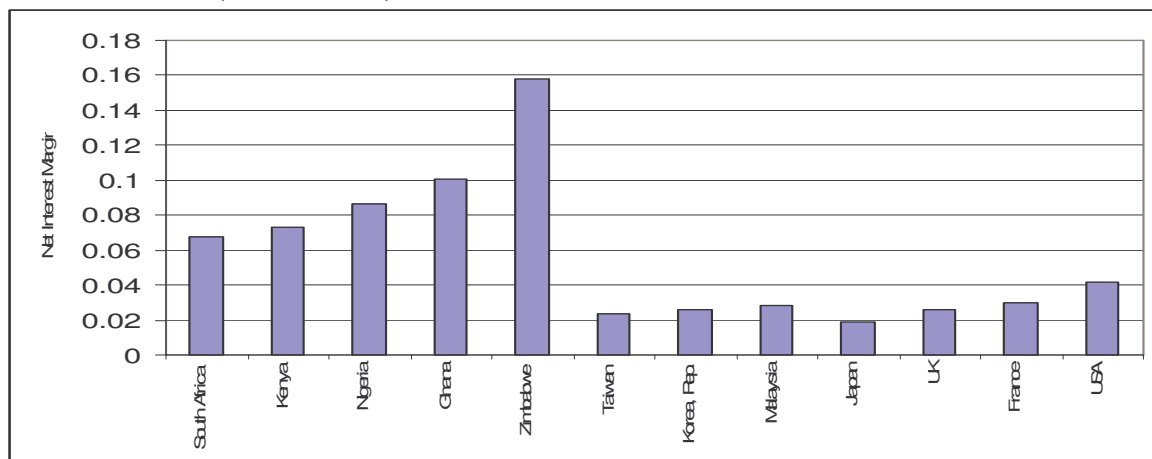
Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000).

The net interest margins for the sample countries are as shown in Table 2.6. In 1995, Ghana had the highest ratio and Zimbabwe had the lowest. By 2004, Ghana's margin had increased to 0.103 that for Kenya had marginally declined to 0.068. Nigeria, South Africa and Zimbabwe's had increased to 0.087, 0.068 and 0.454, respectively. This is quite high

¹⁹ The dataset was established in 2000 by the World Bank's Finance and Private Sector Research programme. The data set we used was updated in 2006.

when compared to the USA's which averaged 0.040 between 1995 and 2004. Figure 2.4 compares the efficiency of sample countries with that of emerging and developed economies and shows that, over the period 1995-2004, Zimbabwe's banking system was the most inefficient, as measured by this indicator, and South Africa had the most efficient banking system. However when compared with emerging economies like Taiwan and Malaysia, we notice that even South Africa is now less efficient. For example, the averages for the period 1995 to 2004 for Taiwan, Korea and Malaysia were 0.023, 0.026 and 0.028, respectively. This shows that South Africa's 1995-2005 average was three times that for Taiwan. In separate calculations not shown in the table, we calculated the average net interest margins for three groups of countries for the period 1995-2004. The first group is made up of sample countries only. The second group is made up of Taiwan, Korean Republic and Malaysia and the third group is made up of Japan, UK, France and the US. We found that the average net interest margins for the period 1995-2004 were 0.097, 0.026 and 0.029 for the first, second and third groups, respectively. This implies that developing economies' banking systems are less efficient as compared to developed economies.

Figure 2.4: A comparison of average net interest margins for sample countries and other countries (1995 – 2005)



Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000)²⁰.

²⁰ The dataset was established in 2000 by the World Bank's Finance and Private Sector Research programme. The data set we used was updated in 2006.

Table 2.7 shows the overhead costs ratio for the sample countries, some other African economies, emerging and developed economies. In 1995, the overhead costs were highest in Nigeria at 0.085 and lowest in Kenya at 0.029. The 1995 ratios for Ghana, South Africa and Zimbabwe were 0.072, 0.049 and 0.57, respectively. This is comparable to Korea's 0.029 in the same period but very high when compared to Malaysia and Taiwan which had overhead costs ratios of 0.015 and 0.016, respectively in 1995. There was a general increase in the overhead costs ratio for the sample countries between 1995 and 2004, with Kenya and Zimbabwe experiencing a doubling of the overhead costs ratio, signaling that there was an increase in inefficiency among the banks, per this measure. In 2004 Nigeria, Ghana and South Africa's overhead costs ratios were 0.079, 0.079 and 0.060, respectively. That there was an increase in inefficiency on this measure can also be seen from the fact that the average overhead costs ratio for the sample countries increased from 0.058 in 1995 to 0.082, in 2004; an increase of more than 40%.

Table 2.7: Overhead Costs Ratio

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Sample Countries										
Kenya	0.029	0.037	0.041	0.047	0.048	0.053	0.06	0.061	0.056	0.061
Nigeria	0.085	0.082	0.082	0.081	0.074	0.084	0.094	0.09	0.093	0.079
Ghana	0.072	0.068	0.074	0.081	0.100	0.088	0.085	0.07	0.084	0.079
South Africa	0.049	0.061	0.058	0.055	0.056	0.063	0.067	0.068	0.070	0.060
Zimbabwe	0.057	0.049	0.042	0.06	0.095	0.099	0.085	0.071	0.083	0.131
Average	0.058	0.059	0.059	0.065	0.075	0.077	0.078	0.072	0.077	0.082
Selected African Countries										
Botswana	0.05	0.042	0.038	0.036	0.038	0.039	0.042	0.049	0.043	0.037
Cote d'Ivoire	0.054	0.045	0.051	0.051	0.051	0.056	0.059	0.062	0.061	0.078
Namibia	0.045	0.043	0.041	0.044	0.042	0.042	0.043	0.042	0.087	0.038
Tunisia	0.021	0.023	0.021	0.029	0.028	0.023	0.023	0.024	0.027	0.027
Uganda	0.062	0.102	0.104	0.078	0.082	0.079	0.078	0.08	0.096	0.093
Senegal	..	0.067	0.048	0.043	0.043	0.036	0.043	0.05	0.047	0.039
Average	0.046	0.054	0.051	0.047	0.047	0.046	0.048	0.051	0.060	0.052
Emerging Economies										
Malaysia	0.015	0.013	0.012	0.015	0.015	0.016	0.017	0.015	0.013	0.014
Taiwan	0.016	0.016	0.014	0.014	0.013	0.015	0.013	0.014	0.014	0.015
Korea, Rep.	0.029	0.028	0.029	0.041	0.018	0.027	0.015	0.015	0.014	0.015
Average	0.020	0.019	0.018	0.023	0.015	0.019	0.015	0.015	0.014	0.015
Developed Economies										
UK	0.026	0.025	0.03	0.03	0.033	0.047	0.043	0.045	0.044	0.042
USA	..	..	0.038	0.037	0.038	0.038	0.034	0.034	0.034	0.034
Japan	0.015	0.016	0.015	0.015	0.022	0.021	0.024	0.024	0.019	0.015
France	0.032	0.033	0.031	0.032	0.031	0.039	0.034	0.034	0.035	0.036
Average	0.024	0.025	0.029	0.029	0.031	0.036	0.034	0.034	0.033	0.032

Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000).

Banks in Africa are characterized by high profitability as compared to those outside Africa. This may be due to the less competitive environment in which the banks exist. In the presence of competition, new banks can enter to compete for the profit. Table 2.8 below shows the profitability for different countries using return on assets of the banks in each of the countries. The five-year average for the sample countries is 3.75, more than five times that of the UK, USA, France and Japan and almost three times that of Brazil, Malaysia and Korea.

Table 2.8: Banking Sector's Return on Assets (Median)

Country	2001	2002	2003	2004	2005	Average (2001-2005)
Sample Countries						
Ghana	3.535	3.190	2.630	3.035	2.335	2.945
Kenya	1.295	1.235	1.500	1.540	1.790	1.472
Nigeria	3.345	2.775	2.585	2.670	2.710	2.817
South Africa	1.440	2.340	1.580	1.580	1.810	1.750
Zimbabwe	6.375	7.165	9.850	9.520	16.005	9.783
Average	3.198	3.341	3.629	3.669	4.930	3.753
Emerging Economies						
Brazil	2.020	2.480	2.130	1.820	2.340	2.158
Malaysia	0.870	0.940	1.090	0.935	1.170	1.001
Korea	0.670	0.780	0.680	0.795	1.030	0.791
Average	1.187	1.400	1.300	1.183	1.513	1.317
Developed Economies						
UK	0.665	0.670	0.680	0.730	0.750	0.699
USA	1.000	1.070	1.030	1.030	1.060	1.038
Japan	0.080	0.100	0.160	0.200	0.305	0.169
France	0.720	0.570	0.650	0.710	0.700	0.670
Average	0.616	0.603	0.630	0.668	0.704	0.644

Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000)²¹.

Bank Concentration. Bank concentration can be used as an indicator of competition among banks. A market characterized by high bank concentration is less competitive since a few big institutions are controlling the market²². Bank concentration complements the indicators on efficiency since a more competitive banking system is most likely to be efficient. We define bank concentration as the ratio of the total assets of the largest three banks to total banking sector assets (Beck *et. al.*, 2000 and Goddard *et al.*, 2001). The ratio is as shown in Table 2.9. In 1995, South Africa had the highest ratio at 0.95 while Kenya had the lowest at 0.62. Ghana, Nigeria and Zimbabwe's ratios were 0.82, 0.67 and 0.74, respectively. For the period 1995-2004, there was a general decline in this measure

²¹ The dataset was established in 2000 by the World Bank's Finance and Private Sector Research programme. The data set we used was updated in 2006.

²² In World Bank Africa Region (2006), it is however, argued that highly concentrated systems are not always uncompetitive since the threat of entry can 'restrain existing firms from overcharging'.

for the sample countries, signaling increasing competition. The competition may be due to financial system liberalization introduced in a number of African countries. The annual average for all the sample countries for the period 1995-2004 was 0.69, much higher than the average for Malaysia, Taiwan and Korea which was equal to 0.42 during the same period²³. The annual average for the UK, USA, Japan and France was 0.45.

Table 2.9: Bank Concentration

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Average (1995-2004)
Sample Countries											
Ghana	0.82	0.78	0.76	0.76	0.78	0.78	0.76	0.74	0.71	0.68	0.76
Kenya	0.62	0.57	0.54	0.58	0.59	0.6	0.61	0.59	0.59	0.59	0.59
Nigeria	0.67	0.49	0.47	0.4	0.42	0.43	0.41	0.42	0.42	0.42	0.46
South Africa	0.95	0.95	0.93	0.93	0.92	0.92	0.93	0.94	0.94	0.76	0.92
Zimbabwe	0.74	0.78	0.75	0.75	0.78	0.63	0.54	0.63	0.73	0.74	0.71
Average	0.76	0.71	0.69	0.68	0.70	0.67	0.65	0.66	0.68	0.64	0.69
Selected African Economies											
Botswana	0.97	0.97	0.98	1.00	1.00	0.98	0.97	0.95	0.84	0.77	0.94
Cote d'Ivoire	0.93	0.92	0.87	0.85	0.79	0.77	0.77	0.79	0.74	0.83	0.83
Cameroon	1.00	1.00	0.85	0.82	0.74	0.71	0.76	0.72	0.63	0.69	0.79
Mali	1.00	1.00	1.00	1.00	0.88	0.75	0.72	0.87	0.84	0.83	0.89
Mozambique	..	0.99	0.96	1.00	0.92	0.86	0.86	0.86	0.86	0.84	0.91
Malawi	..	0.98	0.93	1.00	0.97	0.95	0.95	0.91	0.88	1.00	0.95
Namibia	1.00	0.83	0.82	0.82	0.78	0.8	0.83	0.91	0.86	0.79	0.84
Senegal	0.92	0.72	0.76	0.75	0.7	0.67	0.67	0.63	0.62	0.62	0.71
Uganda	0.76	0.51	0.52	0.59	0.64	0.62	0.57	0.65	0.65	0.63	0.61
Zambia	0.86	0.82	0.93	0.68	0.69	0.66	0.62	0.61	0.58	0.6	0.71
Average	0.93	0.87	0.86	0.85	0.81	0.78	0.77	0.79	0.75	0.76	0.82
Emerging Economies											
Malaysia	0.52	0.49	0.55	0.47	0.50	0.47	0.44	0.40	0.39	0.39	0.46
Taiwan	0.35	0.35	0.32	0.30	0.30	0.30	0.30	0.30	0.29	0.28	0.31
Korea, Rep.	0.50	0.48	0.44	0.50	0.46	0.47	0.53	0.51	0.52	0.50	0.49
Average	0.46	0.44	0.44	0.42	0.42	0.41	0.42	0.40	0.40	0.39	0.42
Developed Economies											
United States	0.31	0.34	0.34	0.34	0.30	0.28	0.28	0.27	0.26	0.29	0.30
Japan	0.48	0.49	0.49	0.46	0.46	0.48	0.46	0.41	0.41	0.41	0.46
UK	0.60	0.50	0.47	0.44	0.41	0.41	0.41	0.46	0.48	0.49	0.47
France	0.58	0.57	0.56	0.54	0.55	0.55	0.58	0.53	0.56	0.57	0.56
Average	0.49	0.48	0.47	0.45	0.43	0.43	0.43	0.42	0.43	0.44	0.45

Source: IFS Online Database, World Development Indicators Online Database and "A new database on Financial Development and Structure – updated in 2006" by Beck *et al.* (2000)²⁴.

2.5 Stock Markets in Africa

African stock exchanges vary widely in terms of liquidity and ease of listing requirements. They are however growing in leaps and bounds (Sheehan and Zavala, 2005). Africa now boasts of 20 stock exchanges, 14 (70%) of these having been

²³This is consistent with World Bank Africa Region (2006) where it was found that the three bank average for African countries was 73% while the world as a whole had an average of 60%.

²⁴ The dataset was established in 2000 by the World Bank's Finance and Private Sector Research programme. The data set we used was updated in 2006.

established since 1989 (Irving, 2006; Murinde, 2006; UNDP, 2003)²⁵. This is a tremendous jump from 4 stock exchanges in 1976 and 11 in 1996 (N'zue, 2006). According to Adjasi and Biekpe (2006), in 2004 the Ghana Stock Exchange was judged the world's best performer while countries like Uganda, Kenya and Nigeria were among the best performers in 2003-2004²⁶. The World Bank Development Indicators' online database shows that total market capitalization (excluding South Africa) increased six fold from about USD 10 billion in 1992 to about USD 62 billion in 2002. The number of listed firms increased from 1875 in 1995 to 2153 in 2005. There are some moves to encourage cross-listing by firms across Africa as well as integrating the stock exchanges (Irving, 2006).

African stock markets are, however, overwhelmingly dominated by only three stock exchanges, the exchanges in Nigeria, South Africa and Egypt. Of the total number of listed firms in Africa the three exchanges accounted for an average of 82% between 1992 and 2002. In terms of market capitalization they accounted for an average of 84% during the same period. According to Irving, there are a number of impediments to the development of stock exchanges in Africa including the fact that there are too few indigenous companies; the average size of the listed firms is small and low liquidity levels.

This section aims to provide a profile of stock markets in Africa as well as to look at the different measures of stock market development and assess how such measures have evolved over time. Emphasis is on Sub-Saharan African (SSA) countries, in general, and sample countries, in particular. There are several measures that can be used to assess stock market development. The following are the measures that we looked at: the number of listed firms, market capitalization ratio and liquidity measures (turnover ratio and total value traded over GDP).

²⁵ See the table in the appendix at the end of the chapter which lists all the stock exchanges in Africa.

²⁶ Using stock market capitalization Singh (1999), found that in 1995 South Africa's stock market was the tenth biggest in the world.

Number of listed firms. The number of listed firms can be used as a crude indicator of stock market development. An increase in the number of listed firms increases activity on the stock exchange. A bigger stock market has many players so it is possible that a significant amount of trading can occur. It must be noted however that most shares may have been purchased by insurance firms and other institutional investors who may be buying to hold. Hence it is important to look at a combination of these measures rather than just one measure. For example, the number of listed firms gives us a very raw index of the size of the stock market but once we get the market capitalization we are able to get a better picture of the value of the firms on the stock exchange. Further analyzing the data to get the value traded gives us the rate at which the shares are changing hands. A higher value traded ratio implies that a trader is most unlikely to be stuck with shares of a given listed firm.

Table 2.10: Number of Listed Firms

Country	Year Established	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Botswana	1989	12	12	12	14	15	16	16	19	19	18	18
Ivory Coast	1976	31	31	35	35	38	41	38	38	38	39	39
Egypt	1988	746	649	654	861	1033	1076	1110	1151	967	792	744
Ghana	1989	19	21	21	21	22	22	22	24	25	29	30
Kenya	1954	56	56	58	58	57	57	55	50	51	47	47
Malawi	1995		1	3	6	6	7	7	8	8	8	8
Mauritius	1988	40	40	40	40	41	40	40	40	40	41	42
Morocco	1929	44	47	49	53	55	53	55	56	53	52	56
Namibia	1992	10	12	13	15	14	13	13	13	13	13	13
Nigeria	1960	181	183	182	186	194	195	194	195	200	207	214
South Africa	1887	640	626	642	668	668	616	542	472	426	403	388
Swaziland	1990	4	6	4	5	7	6	5	5	5	6	6
Tanzania	1996				2	4	4	4	5	6	6	6
Tunisia	1969	26	30	34	38	44	44	46	46	46	44	46
Uganda	1997						2	2	3	3	5	5
Zambia	1994	2	6	7	9	9	9	9	11	11	11	12
Zimbabwe	1896	64	64	64	67	70	69	72	77	81	79	79
Total		1875	1784	1818	2078	2279	2273	2233	2216	1992	1800	2153

Source: World Development Indicators (Various years)²⁷

Note: The data shows the number of firms at the end of each year.

Table 2.10 shows the number of listed firms. Even though the total number of listed firms on African stock exchanges increased from 1875 to 2153 from 1995 to 2005, African stock exchanges still have very few listed firms as compared to emerging or developed

²⁷ We used the World Bank's World Development Indicators Online Database to access all the World Development Indicators data.

economies²⁸. For example, in 1999 India alone had 8000 firms listed on its stock exchange. One reason why there are few firms on most exchanges in Africa is that even those firms that qualify to list are reluctant to do so because the owners fear that they may lose control of the firms (Irving, 2005; Glen and Pinto, 1994). This, however, will be less of an issue if there is a great need to expand the business. The expanded business would at least maintain original owners' share of the pie.

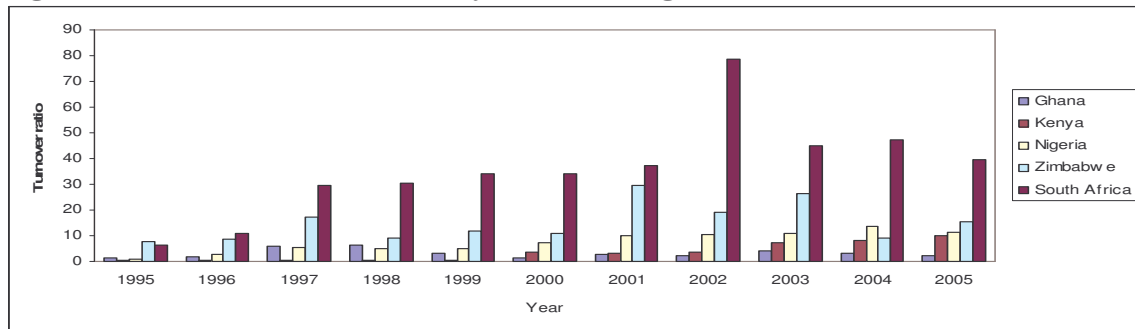
Turnover ratio. Turnover ratio measures trading relative to the size of the stock market. It is defined as the ratio of value of shares traded divided by the market capitalization. Market capitalization is the number of listed shares times their price. The turnover ratio is used to assess the liquidity of a given stock exchange. Stock markets with high turnover ratios are usually characterized by low transaction costs as compared to those with low turnover ratios. According to Levine and Zervos (1998), it is the liquidity of the market that is more important and not the number of listed firms as such²⁹. Liquidity of stock markets can reduce risk through risk sharing which encourages savings and investment. Low liquidity means that it can take a long time to match buyers and sellers. Because of this, low liquidity implies limited opportunities for the channeling of investible funds to productive uses, thus constraining growth. More importantly, it discourages surplus-savings units from relinquishing control of their funds to businesses via ownership of securities (particularly equity). This keeps high the fixed obligation of capital funds (via debt contracts) for businesses. According to Brink and Viviers (2003), an illiquid market tends to create a barrier to investment in securities by making it difficult to determine a market price for an investment as well as by increasing investment risk because of the additional risk emanating from the fact that an investor may fail to dispose of his assets when he or she wishes. This is in line with Levine's argument that investors "come if they can leave". If they know that selling securities is going to be difficult, investors do not buy the securities in the first place.

²⁸ This is in spite of the fact that some of the stock exchanges in SSA were established as early as 1887. A majority of them were established in the late 1980s and early 1990s.

²⁹ Most African stock markets are illiquid and the number of firms listed is also very small.

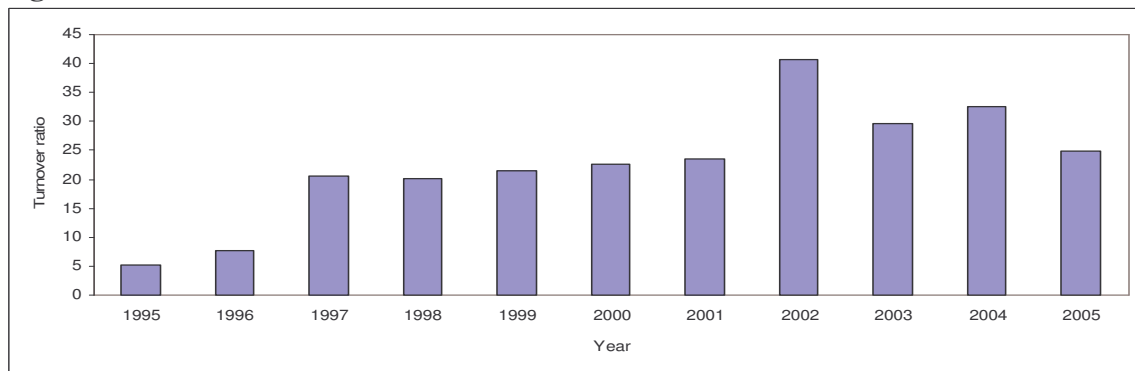
As can be seen from Figure 2.5 the turnover ratio for listed firms in South Africa dwarfs the turnover ratio for the other sample countries, implying that the stock market in South Africa is highly liquid as compared to the other sample countries. In 1995, South Africa and Zimbabwe's turnover ratios were almost at par, that is, 6.51 and 7.58, respectively. The turnover ratios for Ghana, Kenya and Nigeria were 1.3, 0.28 and 0.84, respectively. By the year 2000, the turnover ratio for South Africa had surged to 33.9. This is much higher than the ratios for Zimbabwe, Nigeria, Kenya and Ghana which were 1.5, 3.6, 7.3 and 10.8, respectively. This implies that even though there is a general upward trend in this particular indicator for all the countries, the growth in South Africa's is very high when compared to those in the other countries. That African stock markets are growing can be seen from the turnover ratio for the Sub-Saharan African countries (see Figure 2.6). The overall turnover ratio was around 5% in 1995 and in 2002 it reached a peak of about 40% before slowing down to about 25% in 2005. This implies that between 1995 and 2005 the turnover ratio increased by about 400%.

Figure 2.5: Turnover Ratio in Kenya, Ghana, Nigeria, Zimbabwe and South Africa



Source: World Development Indicators (Various years)

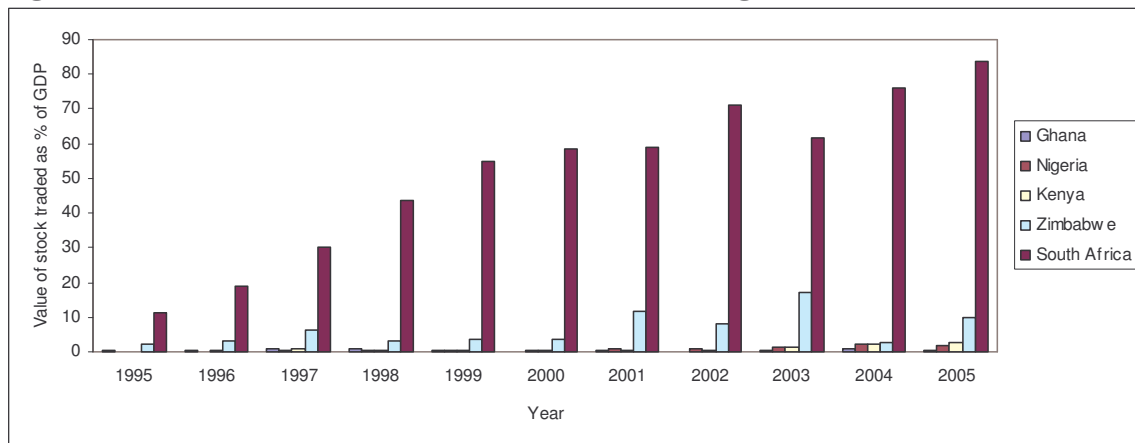
Figure 2.6: Turnover Ratio in SSA



Source: World Development Indicators (Various years)

Value traded ratio. The value traded ratio is calculated as the total value of shares traded divided by GDP. It measures the value of listed firms' equity relative to the country's GDP. Holding everything else constant, a country with a higher value traded ratio is expected to have a more liquid stock market than one with a lower value traded ratio. Figure 2.7 shows that South Africa's stock market, as measured by this indicator, is more developed compared to the other sample countries. In 1995, South Africa's value traded ratio was about 10% of the country's GDP but by 2005 this had increased to more than 80%. Through out the period 1995-2005 Ghana's value traded ratio was less than 1%. In 1995, its value traded as a percentage of GDP was 0.34%. It gradually increased, reaching a peak of 0.80% in 1998 and by 2005 it had slumped to 0.42%. In 1995, Zimbabwe's value traded ratio was equal to 2.1% and it gradually increased, reaching a peak of about 17% in 2003 before declining to 9.86% in 2005. This is relatively higher than Nigeria's and Kenya's value traded ratios which were 1.98% and 2.81%, respectively in 2005. Even though these ratios are quite small when compared to South Africa and other emerging economies, there are some discernible improvements in this measure.

Figure 2.7: Total Value of Stock Traded as a Percentage of GDP

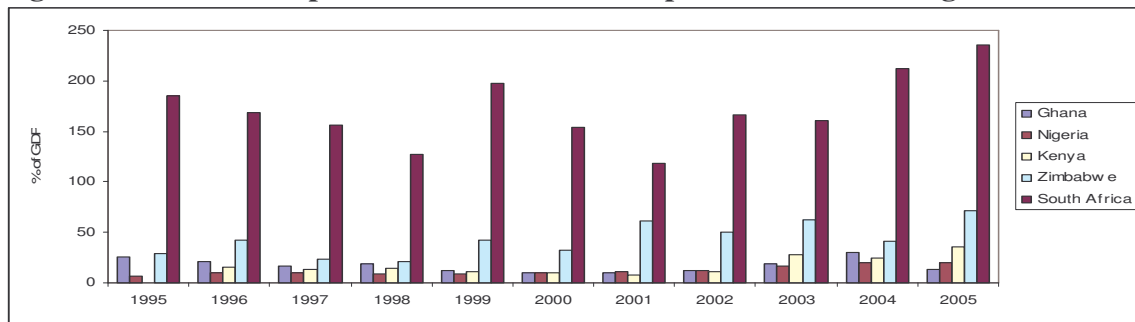


Source: World Development Indicators (Various years)

Market capitalization ratio. The market capitalization ratio is used to measure the size of the stock market. It is calculated as the value of listed shares divided by GDP. An increase in the market capitalization ratio is considered to imply an increase in the size of the stock market in a given economy. For the majority of the sample countries it can be

seen that there was a marginal improvement in stock market development, as proxied by this measure (see Figure 2.8). In 1996, Kenya, Ghana, Nigeria, Zimbabwe and South Africa's market capitalization ratios were 15.32%, 21.5%, 10.1%, 42% and 168.1%, respectively. By 2005, the market capitalization ratios had changed to 35.5%, 12.9%, 19.6%, 71.4% and 235.4% in Kenya, Ghana, Nigeria, Zimbabwe and South Africa, respectively. This implies that there was a general growth in this measure of stock market development, with South Africa and Zimbabwe dominating the other three countries.

Figure 2.8: Market Capitalization of Listed Companies as a Percentage of GDP



Source: World Development Indicators (Various years)

Market capitalization concentration of top 10 firms. To complement the market capitalization ratio we also looked at the market capitalization concentration of the top 10 listed firms. To calculate the concentration we summed the market capitalization of the top ten firms and divided it by the sum of the market capitalization of all listed firms. The 2001-2005 average for the firms is greater than 59% in all the countries (see Table 2.11). The average was highest in Kenya where it was 84.64% and the lowest was in Nigeria where it was 59.15%. The 2001-2005 averages for Ghana, South Africa and Zimbabwe are 79.72%, 69.91%, and 65.99%, respectively. This shows that the stock markets in the sample countries are dominated by a few large firms.

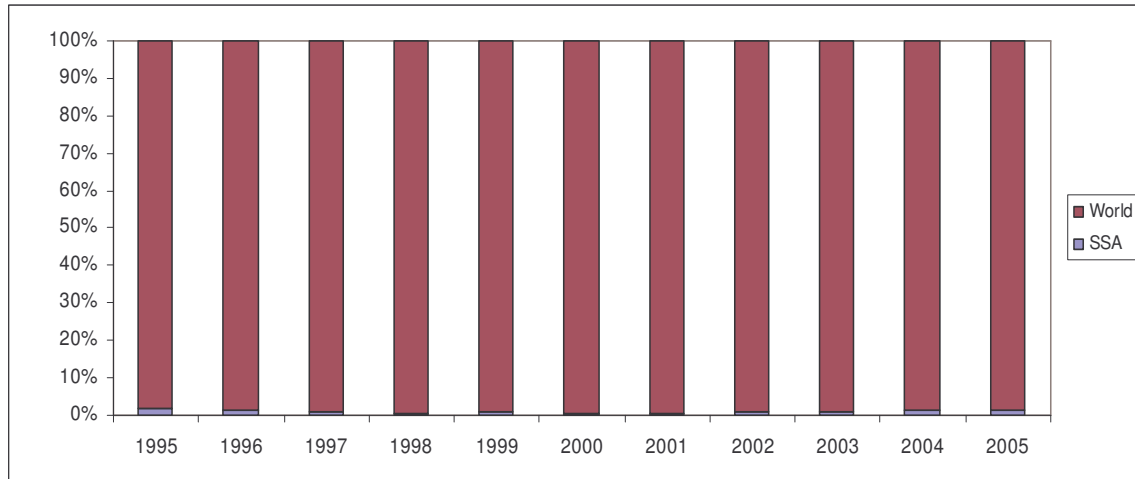
Table 2.11: Market Capitalization Concentration of Top 10 Firms (%)

Country	2001	2002	2003	2004	2005	Average (2001-2005)
Kenya	83.26	85.28	89.72	91.10	73.86	84.64
Ghana	89.99	90.65	83.16	60.10	74.68	79.72
Nigeria	51.18	58.95	62.83	55.19	67.61	59.15
South Africa	73.80	72.20	69.50	64.08	69.98	69.91
Zimbabwe	74.65	52.86	49.81	72.74	79.89	65.99

Source: IFS Online Database and World Development Indicators Online Database

Figure 2.9 shows the market capitalization of the SSA region versus the rest of the world. The picture shows that SSA accounted for a paltry 1% of the world's capitalization during the period 1995 to 2005.

Figure 2.9: Stock Market Capitalization: SSA and the Rest of the World



Source: World Development Indicators (Various years)

2.6 Debt Markets in SSA

In an African context the importance of debt markets cannot be overemphasized. Most governments have realized this and are working on financial sector reforms and privatization in order to improve financial intermediation. Most firms in Africa raise capital from internal resources such as retained earnings and rely mostly on banks for debt financing (Christensen, 2004). But banks have a tendency of biasing firm investment towards short term investment (see Diamond, 1991). The availability of a wide menu of different, easily accessible and affordable sources of finance is critically important for firms, particularly African firms, most of which are held back by the absence of affordable finance. A well functioning debt market can help ameliorate the problem of finance for firms in Africa.

According to Wilton (2003) and Christensen (2004), the debt market in SSA is generally short-term in nature, has limited supply of quality issues, has a narrow investor base and has few illiquid corporate bonds. The other noticeable features of the debt market are that it has inadequate market infrastructure and the domestic debt is mostly in local currency.

These problems make it difficult for potential users of the market to benefit from its many advantages.

The benefits of a well functioning debt market for the economy, in general, and the private sector, in particular, include: reduction in systemic risk thus enabling the financial sector to cope with external shocks like the 1998-1999 East-Asian crisis; firms can easily access long-term finance through bonds rather than through bank debt thus reducing funding mismatch inherent in bank dominated financial systems; since bonds can be bought and sold in the secondary market this means they have a lower liquidity premium and this will reduce cost of capital.

The main players of SSA debt markets include the government and publicly listed firms. The governments are the major players in most SSA debt markets. The government is a regulator as well as an issuer of debt. Because of this it can influence the macroeconomic environment especially through interest rate or monetary policy and by encouraging contractual saving institutions like pension funds to buy its debt even at minimal returns to them. Ideally, the government's major role in this case would be to create an enabling environment that would ensure an active interaction of deficit and surplus-savings units. Over and above this, the government, being the sole supplier of bonds in most African countries, should provide investors with a sizable, regular transparent and market-based supply of bonds through public offerings (Endo, 2003). In a number of African countries the central bank supervises the government security markets while in others the central bank coordinates these activities together with stock exchanges. Annual issuance plans are also publicized so that investors are made aware of the securities to be issued. Countries that do this include Mauritius, South Africa, Namibia, Botswana and Nigeria.

The investor base is composed of those who purchase or demand the bonds offered by issuers. They include commercial banks, central banks, pension funds, non-life insurance, life insurance and individuals. On the supply side we have governments, parastatals, local companies and foreign-owned companies. These are the users of the capital who may be forced to go to the market to raise funds for different purposes. Other than the issuers and

users of capital we also have self-regulatory bodies like bond exchange (e.g., Bond Exchange of South Africa) and stock exchanges whose role is to provide a market for the trading of securities (secondary market activities). Other organizations that play a regulatory role include the capital market authorities. They have different names in different countries: for example, Capital Market Authority or Securities Exchange Commission. Their main role is to supervise the industry and protect investors. Table 2.12 shows the holdings of government debt in SSA debt markets. As can be seen from the table, commercial banks are the main holders of government debt followed by the non-bank firms and finally the central banks.

Table 2.12: Holdings of Government Debt (1980-2000)

Country	Banking Sector			Non-bank Sector
	Total (%)	Central Banks (%)	Commercial Banks (%)	
Burundi	77	55	22	23
Ghana	66	27	39	34
Kenya	50	11	39	50
Mauritius	45	5	40	55
Nigeria	96	66	30	4
Rwanda	21	0	21	79
Seychelles	86	0	86	14
Swaziland	66	0	66	34
Tanzania	86	44	42	14
Uganda	90	17	73	10
Zambia	78	0	77	22
Zimbabwe	53	19	35	47
Average	70	17	54	30

Source: Christensen (2004)

Most African debt markets are characterized by government dominance and minimal or no role for the private sector. To improve activity in the bond markets, efforts are underway in a number of countries to convert existing government domestic debt into tradable, long-term bonds. The amount of debt sourced domestically is significantly smaller than that sourced internationally. This is to be expected since most African countries were easily, bilaterally and multilaterally, accessing cheap loans from a number of organizations and countries. The interest rates for such loans were usually lower than those obtaining in their respective countries. Table 2.13 shows domestic and external debt as percentages of GDP as well as domestic debt as a percentage of the total amount of debt for a number of African countries. As can be seen from the table the size of

government securities markets differ across countries and is generally increasing. And the most common types of domestic debt are treasury bills and bonds.

Table 2.13: Domestic and External Debt

Country	Type of Domestic Debt	1990-1994	1995-2000	1990-1994	1995-2000	1990-1994	1995-2000	1990-1994	1995-2000
		Domestic Debt		External Debt		Total Debt		Domestic/Total (%)	
Botswana		0	0	4	10	4	10	0	0
Burundi	TB,TC	2	6	96	138	98	144	2	4
Ghana	TB	8	24	55	83	64	106	13	22
Kenya	TB,B	23	22	77	52	100	74	23	29
Mauritius	TB	29	33	21	15	50	48	57	69
Namibia	TB	8	19	4	2	12	21	69	89
Nigeria	TB,B,TC	29	16	93	80	122	97	24	17
Rwanda	TB,B	9	5	55	70	65	75	14	7
Seychelles	TB,B	45	68	24	20	69	88	65	77
South Africa	TB,B	37	45	0	0	37	45	100	100
Swaziland	TB,B	1	1	21	16	22	17	5	7
Tanzania	TB	6	12	131	100	137	112	5	11
Uganda	TB	1	2	73	57	74	59	1	4
Zambia	TB,B	9	6	178	196	186	202	5	3
Zimbabwe	TB,B	29	37	34	48	63	86	45	44
Average		12	15	87	103	102	118	19	22

Source: Christensen (2004)

All figures are in percentages of GDP unless otherwise stated. TB=Treasury Bills; TC=Treasury Certificate; B=Corporate Bond.

In terms of the corporate bonds few firms issue bonds in Africa. The countries that have firms issuing bonds include South Africa, Kenya (which has 4 corporate bonds) and Nigeria. Tanzania has 2 bonds issued by East African Development Bank and Preferential Trade Area.

2.7 The Legal Systems

2.7.1 Introduction

The link between law and economics or between the judiciary and economic growth has long been appreciated (see, for example La Porta *et al.* (1997, 1998, 2000); Gastanaga *et al.* (1998); Levine, 1998; Galindo, 2001; Demigurc-Kunt and Maksimovic, 1998; Fabbri and Padula, 2004; Djankov, 2003). An environment in which contracts are expeditiously enforced, the legal system transparent and efficient, the rights of creditors protected and the loan recovery process efficient, does not only result in increased supply of affordable external finance but also improves the investment climate thus facilitating investment and economic growth (Laeven and Majnoni, 2003). Demigurc-Kunt *et al.* (2004), and Bae

and Goyal (2003) find that the costs of financial intermediation are lower in countries with better property rights. In Jappelli *et al.* (2005), better judicial systems tend to reduce credit constraints and increase external finance. In Pinheiro (1995), improving the judicial system stimulates economic growth. In Shleifer and Vishny (1996), poor contract enforcement reduces the incentives for debtors to pay thus reducing the willingness of creditors to extend credit. In La Porta *et al.* (1997), better legal systems spur financial development.

Gastanaga *et al.* (1998) argue that efficient contract enforcement tends to stimulate foreign direct investment. Levine (1999) found that economies where the rights of creditors and investors are protected have well developed financial markets and that the countries tend to grow faster. The extant literature is also replete with research that argues that there is a positive relationship between judicial efficiency and external finance supply (see, for example Galindo, 2001, Demirguc-Kunt and Maksimovic, 1998). Laeven and Majnoni (2003) looked at the relationship between judicial efficiency and the cost of financial intermediation and found that judicial efficiency does influence the interest rate spreads across countries suggesting that judicial efficiency, including the enforcement of debt contracts, can tremendously lower the cost of transferring surplus funds from surplus to deficit units.

How the legal system operates has serious economic implications. The important aspects are the content of the law as well as its enforcement (Fabbri and Padula, 2004). In the context of borrower-lender interactions, a legal system must be such that the rights of the lender are protected so that in the event of default, contractual obligations can be enforced. Firms operating in an environment characterized by poor laws and inefficient contract enforcement, like in most African economies, are most likely to be credit-rationed since poor protection of lenders and poor enforcement of contracts reduce a borrower's incentive to repay, which in turn force banks and other lenders to ration credit (Fabbri and Padula, 2004).

This section explores the legal systems and enforcement in Africa. Law and the quality of its enforcement are important factors of legal rights of security holders. More importantly, the protection that investors receive from the legal system determines their readiness to extend finance to firms. The legal system in the five sample countries is modeled on common law, which is of English origin. The common law is based on judgments by judges as well as by precedents (La Porta *et al.*, 1998). According to La Porta *et al.*, common law countries tend to have the strongest legal protection of investors while the French civil law tends to have the weakest. The issues that we explore in this section are contract enforcement, shareholder rights and creditor rights.

2.7.2 Contract Enforcement

Efficient contract enforcement affects the willingness of lenders to extend finance to borrowers. If contract enforcement is inefficient, lenders are less willing to offer credit and this tends to affect the optimal operations of credit markets (e.g., Cristini *et al.*, 2001 and Pinheiro, 1999). In Pinheiro (1999), a decrease in contract enforcement efficiency reduces credit supply while increasing the price of credit. Cristini *et al.* (2001), looked at the legal system and credit markets in Argentina and found that provinces with poor legal enforcement tend to have less credit as compared to those with better legal enforcement. In Djankov *et al.* (2006), richer countries are more efficient than poorer countries when it comes to debt contract enforcement. Different countries at different stages of development have different enforcement institutions that are appropriate at that level of development. Djankov *et al.* (2006) also found that legal origin does matter when it comes to debt contracts enforcement, with Nordic and common law countries being the most efficient while the French legal origin countries have the lowest level of contract enforcement efficiency.

There are several mechanisms of contract enforcement. According to Fafchamps (1996, 2004) and Fafchamps and Minten (2001), enforcement mechanisms can be categorized into three forms; those that are based on guilt, those based on coercion and those based on repeated interaction. When it comes to contracts based on guilt, the intuition is that people feel guilt if they fail to honor business contracts. Such a feeling may force them to fulfill their contractual obligations. Contract enforcement through coercion entails forcing

the delinquent debtor to pay up. Coercion can take legitimate or illegitimate forms (Fafchamps, 1996). Legal coercion occurs through courts while illegal coercion can occur through threats or violence. Repeated interaction acts as an enforcement mechanism because economic agents that do not fulfill their contractual obligations at, one stage, may fail to get future loans not only from their original creditors but also from other potential creditors who may have heard of their bad record. Repeated interaction gives the economic agent an incentive to accumulate reputational capital. Economic theory does not tell which one of the above is the best (Djankov, 2003).

The main institutions that enforce contracts are the courts. The courts in Africa are considered less efficient than those in more developed economies. They take a long time to resolve disputes, are most likely to be corrupt and are less independent from government interventions. Nganga *et al.* (2003) argue that the legal systems in most African economies are slow and patchy³⁰. For example, in a survey of Ghanaian firms Fafchamps (1996) found that very few firms use the legal procedure to resolve commercial disputes. Out of the 58 Ghanaian firms surveyed only 10 ever consulted a lawyer and most firms preferred not to use the police in commercial disputes. In Beckmann and Boger (2004), it was found that most firms from Poland were not willing to seek the courts' assistance when it comes to the resolution of commercial disputes. This is also consistent with Koford and Miller's (2006) findings in Bulgaria during its transition period. They found that firms were less willing to engage the police in their disputes. They also found that because of the weaknesses of the court system many firms had long-term relationships but short-term contracts, with most transactions being conducted on the spot. In Woodruff (1998), Mexican manufacturing firms rarely relied on courts to enforce contractual obligations.

All such weaknesses imply that economic agents, especially creditors, lack confidence in the legal systems. Consequently, sources of external finance are less willing to relinquish control of their funds. This is consistent with our finding in chapter 2 where it was

³⁰ According to Demsetz (1967) and Djankov *et al.* (2003), courts work in countries that are richer and have better educated population. An educated population helps to increase the efficiency of the courts.

documented that most firms in Africa tend to finance additional investment using internal funds and where debt is used they tend to use short-term rather than long-term debt. This, it would seem, is not a choice by the firms but probably some environmental constraints beyond their control.

That markets in developing economies, including African markets, are characterized by acute information asymmetry is a well known fact in the literature (for example, see Arkelof, 1970; Stiglitz and Weiss, 1981; on the various impacts of information asymmetry). Such information asymmetry does not only result in moral hazard and adverse selection problems but it also generates contract enforcement problems in the sense that it makes compliance of contractual obligations difficult to verify by other agents as well as by the courts (Fafchamps, 2004). For example, moral hazard and adverse selection problems can make it more difficult to distinguish between genuine and honest inability to pay and opportunistic behavior or carelessness on the part of a borrower. As a result, contract enforcement by the courts alone may not be sufficient, other forms of enforcement may be required to supplement and sometimes to reduce the propensity to seek resolutions from the courts.

Harsh penalties tend to result in inflexible contracts that may reduce and take care of moral hazard and adverse selection problems. Inflexible contracts can impose harsh penalties on genuine borrowers who may default due to negative shocks outside their control. Such borrowers are the borrowers that lenders prefer to deal with but they may not borrow due to the punitive contractual terms. According to Fafchamps (2004), contracts must be designed in such a way as to discourage opportunistic behaviour while at the same time still allowing *bona fide* borrowers to access funds. If borrowers fail to pay back the loans and interest due to factors beyond their control, this must be excusable, in such a case the creditors must be able to renegotiate the debt contract.

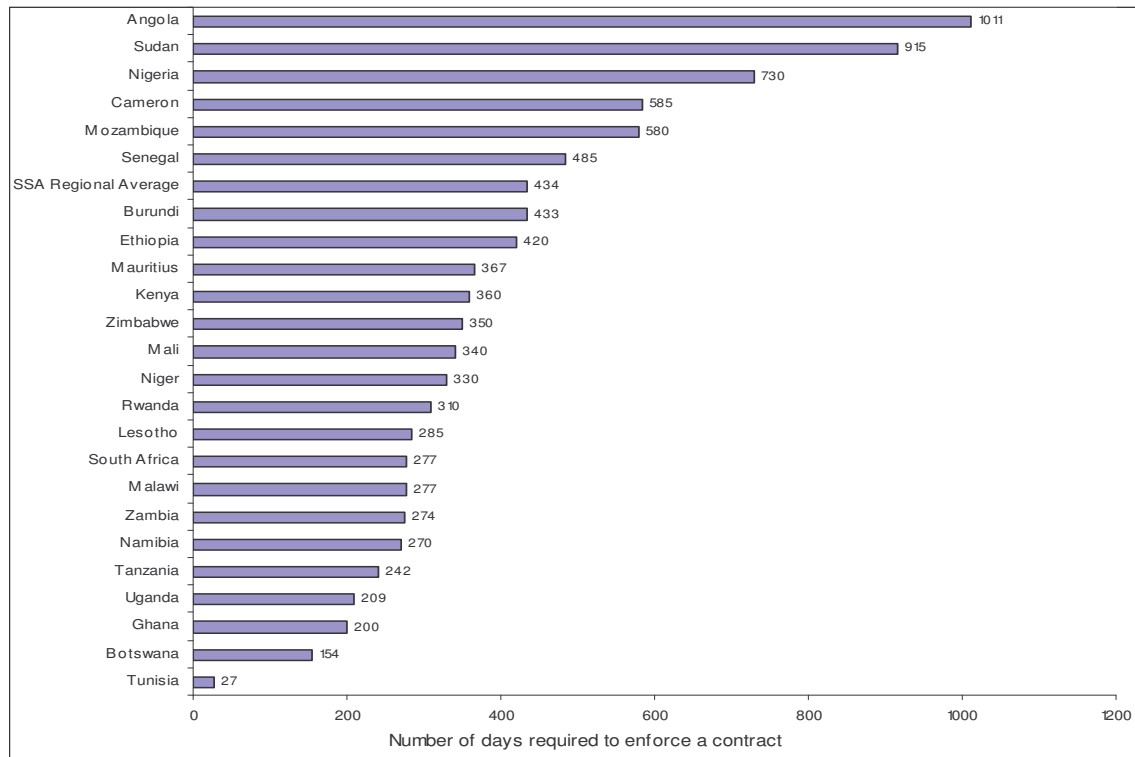
In order to assess the efficiency of the courts when it comes to contract enforcement, we use the World Bank's Doing Business Database. The three main indicators of contract enforcement efficiency we use are the cost of recovering debt, the time it takes to resolve

disputes and the number of mandated procedures that a plaintiff goes through to conclude a dispute. The costs of recovering debt include the attorney fees, court fees and other costs incurred during the resolution of the case. The time to resolve the dispute is measured in calendar days and is measured from the time the plaintiff files the lawsuit in court to the moment of settlement (Doing Business, 2004a). The number of procedures involved in resolving a dispute is defined by the World Bank (2004a: 42) as follows:

“The number of procedures, mandated by law or court rules, that demand interaction between the parties to the dispute or between them and the judge or court officer.”

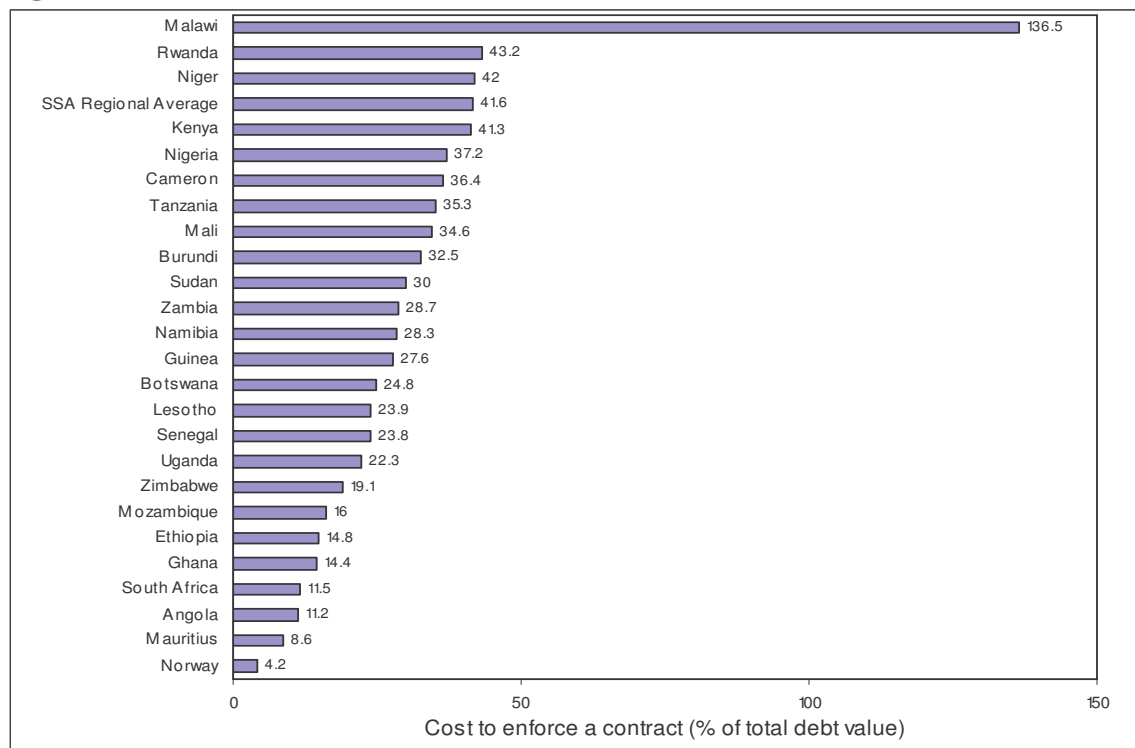
Figures 2.10 - 2.12 show the indicators of contract enforcement efficiency in sub-Saharan African. As can be seen from the figures, there are significant differences across the countries when it comes to contract enforcement efficiency. In South Africa it costs the creditor 11.5% of the claim amount to recover the debt. The creditor must go through 26 procedures and it takes 277 calendar days for the creditor to recover the debt. In Zimbabwe the debt recovery process takes 33 procedures and 350 days. It costs 19.1% of the total debt value to recover the debt. In Nigeria and Kenya the debt recovery process costs 37.2% and 41.3% of the total debt claimed, respectively. To take the process from the filing of the lawsuit to its conclusion it takes 23 procedures in Nigeria and 25 in Kenya, while the time to do that in the two countries is 730 and 360 calendar days, respectively. In Ghana the cost, duration and the number of procedures of recovering debt are 14.4% of the value of total debt claimed, 200 calendar days and 23 procedures, respectively. The Sub-Saharan Africa regional averages for the indicators of contract enforcement efficiency are 41.6% of the claimed amount, 434 days and 36 procedures for cost, duration and number of procedures, respectively. This is quite high when benchmarked against the world's best: the lowest in the world is 4.2%, while the lowest number of procedures is 11 calendar days and the lowest period to recover debt is 27 calendar days.

Figure 2.10: Time to Enforce a Contract



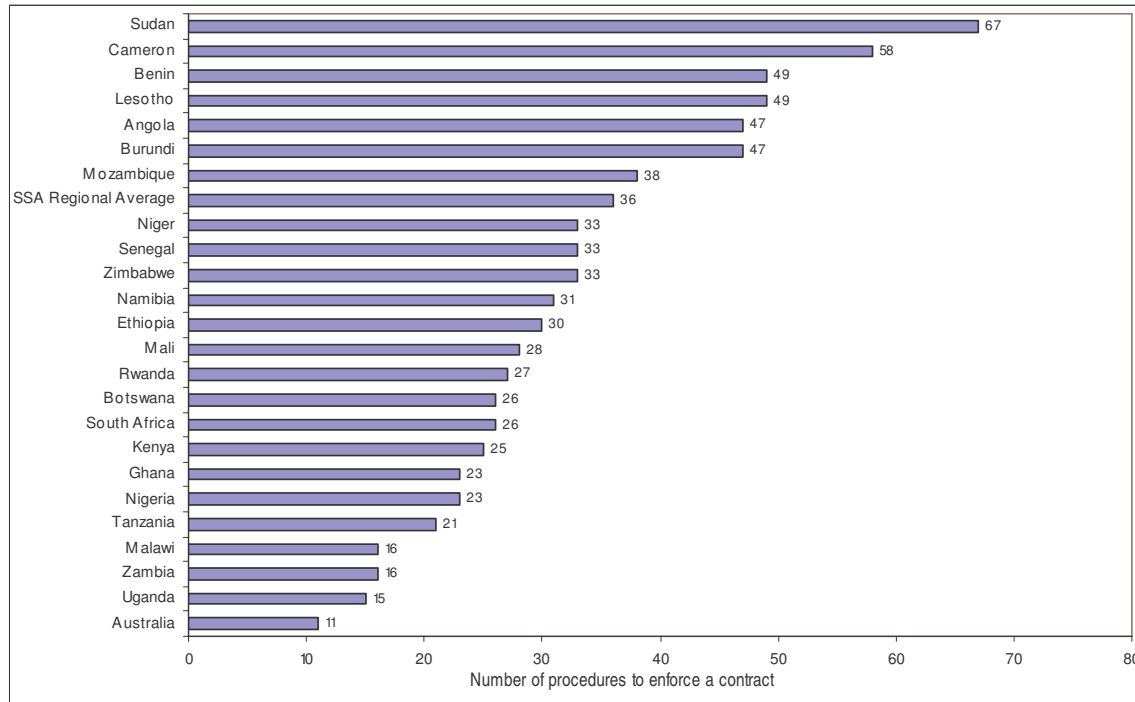
Source: Doing Business Database

Figure 2.11: Cost to Enforce a Contract as % of Total Debt Value



Source: Doing Business Database

Figure 2.12: Number of Procedures to Enforce a Contract



Source: Doing Business Database

2.7.3 Other forms of contract enforcement

Given the weaknesses in legal contract enforcement in most African countries, economic agents have improvised ways and means to ensure the continual flow of funds from surplus to deficit units. Most of these measures like mutual trust and reputation are more interpersonal. According to Fafchamps (2004), trust tends to act as a replacement of legal enforcement. Trust tends to increase with repeated interaction between economic agents. In most transactions that are not interpersonal the information set any one economic agent may have concerning a potential borrower is virtually empty but with repeated interaction the agents come to know each other and conduct themselves well³¹. In such a case trust can be construed to be some social function that increases with good behaviour and falls with bad behaviour. In the context of borrower-lender relationships, interaction

³¹ As stated in chapter 3 both lender and the borrower have an incentive to acquire good reputation. According to Diamond (1989, 1991), the borrower attempts to acquire reputation by complying with contractual obligations. The lenders too must acquire good reputation especially when it comes to the decision to liquidate or renegotiate with defaulting firms. Firms or borrowers prefer lenders that are good at correctly identifying defaulters; i.e., liquidating firms that would not make it and renegotiating contracts for firms that are experiencing a temporary set back. If a borrowers defaults because of a temporary negative shock the lenders must be able to renegotiate the contract to allow the firm to continue operating. The lender must be able to separate such defaulters from those that default because of carelessness or incompetence.

allows the lender to know the ability of the borrower to comply with the legal debt obligations. This helps the lender to determine the appropriate loan amount and the interest rate to charge. Sometimes it may be necessary to offer the borrower a debt contract which is such that the borrower will initially receive part of the full amount requested with a provision that more shall be provided if the borrower honors earlier debt obligations.

Trust tends to emphasize interpersonal relationships and thus facilitates the transfer of funds among friends or relatives or members of a given ethnic group or religion³². If an individual who belongs to a given group fails to honour some contractual obligations he or she will not only be punished by the individual lender but by all members of the group – what Fafchamps (2004) called “joint punishment”. In a survey of Russian firms, Hendley *et al.* (1997, 2000) found that most firms tend to use information-sharing to penalize a firm that would have failed to honor its contractual obligations.

Caves and Gonzalez-Vega (1996), in their study of rural financial intermediaries in Indonesia, found that the lending organizations tend to use political heads to induce loan repayment as well as to select borrowers. The village heads, who receive a fee which they consider an asset whose value falls if they select bad borrowers, help reduce *ex-ante* and *ex-post* opportunism on the part of the borrower as they put pressure on the borrower to recover the delinquent amount. In Woodruff (1998), Mexican trade associations, by gathering member information, also accumulated information on member’s reputation. The need to acquire more reputation forces firms to “behave well” and thus acts as a contract enforcement mechanism.

2.7.4 Shareholders Rights

There is always a possibility of expropriation of shareholder wealth by managers and controlling shareholders of a firm (Jensen and Meckling, 1976; La Porta *et al.*, 1997, 1998 and 2000). To reduce such expropriation, shareholders must be protected by law. According to La Porta *et al.* (1998), one way of reducing such expropriation is to

³² Koford and Miller (2006) interpret trust as an “equilibrium in which each firm believes, with good reason, that the other player will fulfill the contract, even though the other firm could act opportunistically and make short-run profits, but it would not be profitable over the long run to do so”.

establish standards of retention and distribution of capital to investors. According to La Porta *et al.* (1998), shareholder rights include rights to receive dividends, to vote for directors, participate in shareholder meetings, subscribe to new issues of shares, participate in shareholders meetings and call for extraordinary meetings.

In environments where there is poor investor protection it is better for entrepreneurs to keep control. This may force the firm to remain unlisted if the entrepreneur's control benefits outweigh the costs of listing. This may explain the small number of firms listed on most African stock exchanges. According to La Porta *et al.* (2000), in a case where investor protection is poor it may be necessary for a family-owned firm to continue to be under the control of the family, as this will tend to reduce the expropriation of wealth by insiders. The family may have, over the years, acquired reputation which they can use to access external finance.

We use the La Porta *et al.* (1998) framework to assess shareholder rights in the sample countries. The main issues we look at are: whether one-share-one-vote is a requirement for companies in the sample countries, whether minority shareholders are oppressed, level of anti-director rights; whether there is mandatory dividends as well as the percentage of share capital needed to call an extraordinary shareholder meeting and preemptive rights to new issues. According to La Porta *et al.* (1997, 1998), one-share-one-vote requirements tend to reduce the tendency of insiders to misuse cash flows. The deviations from the one-share-one-vote rule include, among other forms, issuing non-voting shares, issuing low and high-voting rights, issuing shares whose value increase with the time they are held (La Porta *et al.*, 1998).

The other important means of protecting shareholders are anti-director rights. These assess the extent to which a country's legal system protects minority shareholders against insiders (La Porta, *et al.*, 1997, 1998). There are several ways of protecting minority shareholders. These include giving minority shareholders the right to sue directors in court if they feel oppressed by directors' decisions, giving shareholders the right to buy new issues of shares, lowering the percentage of share capital required to call an

extraordinary meeting of shareholders as well as mandatory dividends (La Porta *et al.*, 1998). If the percentage required to call an extra-ordinary meeting is low this implies more power to minority shareholders.

In the Table 2.14, we use a dummy variable which is equal to 1 if a country allows one-share-one-vote. If a country allows shareholders to vote via proxy we also put one and zero if they do not. An oppressed-minorities mechanism is in place if shareholders are allowed to vote against oppression by directors. The column labeled “oppressed minority” is 1 if this mechanism is in place and zero otherwise. In line with the La Porta *et al.* (1998) framework, we define the anti-director rights index as a summation of one-share-one-vote, proxy by mail allowed, oppressed minority, pre-emptive right to new issues and the percentage of share capital needed to call an extraordinary meeting. Note that each country is given a value of 1 if the percentage of share capital required to call an extraordinary shareholder meeting is equal to or less than 10%. One-share-one-vote is not mandatory in all the sample countries. Voting by mail is allowed in Ghana, Nigerian and South Africa but disallowed in Kenya and Zimbabwe. Minority shareholders can vote against perceived oppression in all the sample countries. The minimum percentage required to call an extraordinary shareholder meeting is 5% in Ghana, South Africa and Zimbabwe and 10% in Kenya and Nigeria.

The anti-director index is highest in South Africa where it is equal to 5. In Nigeria, Kenya, Ghana and Zimbabwe the index is equal to 3. Given such information one would expect to see credit being offered in countries with high anti-director rights index. According to this measure, South Africa did well relative to other sample countries. It also did well relative to other emerging economies like Argentina, South Korea and Taiwan. This may be one of the reasons why South Africa has the largest number of listed firms than other sample countries. The anti-director indices for the three countries are 4, 2 and 3, respectively. One would expect to see more firms being listed in economies where the index is high as it indicates high protection of minority shareholders.

Table 2.14: Shareholders Rights

Country	One-share-one vote	Proxy by Mail allowed	Shares not blocked before meeting	Cumulative voting	Oppressed Minority	Pre-emptive right to new issues	% of share capital to call an extra-ordinary shareholder meeting	Anti-director rights
Sample countries								
Ghana ³³	0	1			1	0	0.05	3
Kenya	0	0	1	0	1	0	0.10	3
Nigeria	0	1	1	0	1	0	0.10	3
South Africa	0	1	1	0	1	1	0.05	5
Zimbabwe	0	0	1	0	1	0	0.05	3
Emerging Economies								
Argentina	0	0	0	1	1	1	0.05	4
South Korea	1	0	0	0	1	0	0.05	2
Taiwan	0	0	0	1	1	0	0.03	3
Developed Economies								
Australia	0	1	1	0	1	0	0.05	4
Canada	0	1	1	1	1	0	0.05	5
UK	0	1	1	0	1	1	0.10	5
USA	0	1	1	1	1	0	0.10	5

Source: Adopted from La Porta *et al.* (1998)

In order to better understand the protection of those that supply external finance, we also utilized the World Bank's Doing Business Database³⁴. The advantage of the database over the La Porta *et al.*'s (1998) measure is that it is more recent and it covers all the sample countries. While the La Porta *et al.* index is based on the laws of each country, the index from the World Bank sort the views of lawyers and business people in each of the countries covered³⁵. We present both measures because we feel they compliment each other in giving a clearer picture concerning investor rights in the sample countries and beyond. Table 2.15 shows the data from the Doing Business Database. The disclosure index is an index ranging from 1 to 10. Higher values imply greater disclosure.

Looking at the sample countries we note that greatest disclosure is in South Africa and Zimbabwe, where it is equal to 8, while the lowest is in Kenya, where it is equal to 4. The disclosure index in Ghana and Nigeria is equal to 7 and 6, respectively.

³³ Ghana was not included in La Porta *et al.* (1998), its figures are from the author.

³⁴ The data for this part of the Doing Business Database came from a survey of corporate lawyers. The information covers the company laws, civil laws and securities regulations of each country covered (World Bank 2006).

³⁵ La Porta *et al.*'s (1998) methodology is very useful. It is, however, usually criticized because it tends to look at just only the laws on the books and thus does not really provide us with what exactly happens (Djankov, 2006). Since what is in the law books may not necessarily be what is happening on the ground, it is an important shortcoming.

Table 2.15: Investor Protection Index

Region or Economy	Disclosure Index	Director Liability Index	Shareholder suits index	Investor Protection index
Sample countries				
Kenya	4	2	10	5.3
Ghana	7	5	6	6
Nigeria	6	7	4	5.7
South Africa	8	8	8	8
Zimbabwe	8	1	4	4.3
Other African countries				
Angola	5	6	6	5.7
Botswana	8	2	3	4.3
Cameroon	8	2	6	5.3
Chad	3	4	7	4.7
Lesotho	2	1	8	3.7
Malawi	4	7	5	5.3
Mali	6	5	3	4.7
Mozambique	7	2	6	5
Namibia	5	5	6	5.3
Rwanda	2	5	1	5.7
Sudan	0	6	5	3.7
Swaziland	1	1	7	4.7
Tanzania	3	4	7	4.7
Togo	4	3	5	4
Uganda	7	5	4	5.3
Zambia	3	6	7	5.3
Regions				
SSA	4.4	4.5	5.2	4.7
OECD	6.3	5	6.6	6
South Asia	4.4	4.3	6.4	5
MENA	5.8	4.6	3.5	4.6
Latin America and Caribbean	4.3	5.1	5.8	5.1
Europe and Central Asia	4.7	3.8	6	4.8
East Asia and Pacific	5.2	4.4	6.1	5.2

Source: Doing Business (World Bank)

The director liability index also ranges from 0 to 10 with higher values indicating high liability of directors (see Table 2.15). Zimbabwe has the lowest director liability index equal to 1. At 8 South Africa had the highest director liability index. Kenya, Ghana and Nigeria's indices were 2, 5 and 7, respectively.

The shareholders suits index, which indicates the powers of the shareholders to contest decisions taken by management, also ranges from 0 to 10, with higher values indicating increasing powers of shareholders to contest perceived oppression by management. The index is highest in Kenya where it is equal to 10 while lowest in Nigeria and Zimbabwe

where it is equal to 4. In Ghana and South Africa the index is equal to 6 and 8, respectively.

The investor protection index is an average of the three indices and ranges from 0 to 10 as well. It is highest in South Africa, where it is 8, and smallest in Zimbabwe, where it is 4.3. Kenya, Ghana and Nigeria's indices are equal to 5.3, 6 and 5.7, respectively. The region average is 4.7, slightly higher than that for MENA countries which is equal to 4.6. The investor protection index for OECD countries is 6.

2.7.5 Creditor rights

One of the most important factors that facilitate the transfer of funds from surplus units to deficit units is the power of creditors. Such power may include the creditors' ability to force repayment as well as annex collateral (Djankov, 2006). The power of creditors can also be in the form of them being able to take control of the delinquent firm. An increase in creditors' rights increases their power. This tends to increase their willingness to extend credit (see for example, Hart and Moore (1998) for a formalization of this point).

The protection of creditors comes in the form of laws that deal with reorganization of a firm in difficulties as well as bankruptcy procedures. Such laws establish ways and means that creditors can use to annex collateral and covenants that protect seniority. Creditors can temporarily relinquish the control of their savings and finance firms if their rights are well protected by law (La Porta *et al.*, 2000). In an environment in which investors have more voting rights and creditors have reorganization and liquidation rights, more finance can move from surplus to deficit units than when investors and creditors do not have such rights. La Porta *et al.* (2000) argues that in an environment with no investor protection, it is easy and inexpensive for insiders to steal from the firm. But as investor protection improves it becomes more difficult and costly for the insiders to expropriate the wealth of the firm. As it becomes more and more difficult to expropriate outsider wealth, external finance becomes more and more available.

La Porta *et al.* (1998) constructed a creditor rights index by looking at four important issues. The first one is whether or not there is an automatic stay on the assets of a defaulting firm. If there is an automatic stay this tends to protect unsecured creditors at

the expense of secured creditors (La Porta *et al.*, 1998). In this case we want to assess the requirements that protect secured lenders. Since we are taking the perspective of secured creditors a country which does not require an automatic stay on assets of a defaulting firm upholds the rights of secured creditors and gets a value of 1 and zero otherwise. The second issue is whether or not a country allows creditors the right to collateral in reorganization. If this is allowed the country gets a value of 1 and zero otherwise. The third issue is whether or not there are some restrictions when it comes to reorganization. If management is allowed to reorganize without any restrictions from creditors then that tends to reduce creditor rights (La Porta *et al.*, 1998). A country that has such restrictions gets a value of 1 while that without gets 0. The fourth issue is whether or not management can stay during the reorganization process. In countries where the management is replaced by creditor appointees during the reorganization procedure, there is more creditor power than in countries where this is not the case. A country in which the law provides for creditor appointees has more creditor rights so it gets a value of 1 while that which does not gets 0.

Kenya, Nigeria and Zimbabwe allow for automatic stay on assets while South Africa does not. All the countries have legal provisions that allow; creditors to be paid first, for restrictions on reorganization, and for the management not to stay during reorganization. The creditor rights index is an aggregate of the four issues explained above. Kenya, Nigeria and Zimbabwe all have an index equal to 4 while South Africa has an index equal to 3 (see Table 2.16).

Table 2.16: Creditor Rights

Country	No automatic Stay on Assets	Secured Creditors Paid First	Restrictions for going into reorganization	Management does not stay in reorganization	Creditor Rights
Kenya	1	1	1	1	4
Nigeria	1	1	1	1	4
South Africa	0	1	1	1	3
Zimbabwe	1	1	1	1	4

Source: Adopted from La Porta *et al.* (1998)

2.8 Conclusion

Firms in Africa find themselves in a difficult situation when it comes to raising external capital. The capital markets are underdeveloped. The stock markets in Africa are a potential source of external funds but at the moment the exchanges are very small, illiquid, dominated by institutional investors that buy securities to hold and the majority of firms do not use them to raise capital as most firms in Africa are unlisted. The corporate debt markets are at nascent stages of development and are dominated by the government. The environment in which they operate is characterized by information asymmetry, contract enforcement inefficiency, macroeconomic instability and policy uncertainty. All such factors reinforce each other, creating an environment in which surplus economic agents are less willing to relinquish the control of their excess funds to firms and in cases when they extend credit, they are less willing to offer long-term finance. Consequently, most firms depend largely on internal funds for new investments. Given the potential role that the private sector can play in driving economic growth in Africa, internal funds alone are hardly enough for sustainable growth.

In this chapter we used a number of financial development indicators to assess the evolution of the financial sector in the sample countries. The indicators looked at measure financial system size, competition among banks and banking efficiency. The analysis suggests that even though African countries are lagging behind on different measures of financial development the pace of development is improving.

Bank branches per 100 000 people was less than 6 (in 2004) for the sample countries. The world average is almost 10 for the same period. In SSA only 20% of the adult population had access to bank accounts (IMF, 2007). Domestic credit as a percentage of GDP was less than 30% (average for the period 1980-2005) for the sample countries (excluding South Africa, whose figure is 101.01). But this indicator had improved over time. When it comes to efficiency, the financial systems in the sample countries are less efficient as compared to either emerging or developed economies. For the sample countries the average net interest margin for the period 1995-2005 was more than 0.06 while for emerging economies the figure was less than 0.03. Overhead costs are also high

in the sample countries as compared to emerging and developed economies. Banks in Africa are however more profitable than those in either emerging or developed economies. For example the rate of return of the banks in the sample countries for the period 2001-2005 was 5 times that of the developed economies and 3 times that of emerging economies. The banking systems are oligopolistic as evidenced by the few banks that dominate the systems. For example the assets of the top three banks in the sample countries accounted for almost 70% of the total banking assets. This is almost twice that found in emerging economies.

The stock markets in Africa are still very small. They accounted for 1% of the world's capitalization during the period 1995-2005. They are however growing as evidenced by different stock market indicators. For example, the number of stock exchanges increased by almost 70% between 1989 and 2006. Total market capitalization (excluding South Africa) increased six fold from about USD10 billion in 1992 to about USD 62 billion in 2002. The number of listed firms increased from 1771 in 1992 to 2213 in 2002. The average turnover ratio for the sample countries was 5% in 1995 and by 2005 the figure had surged to 25%, the dominance of South Africa notwithstanding. The African stock market is however dominated by three stock exchanges from Nigeria, South Africa and Egypt. For the period 1992-2002, the stock exchanges of the three countries accounted for 82% and 84% of the number of firms listed in Africa and of the total market capitalization in Africa, respectively.

One of the factors that affect the willingness of external finance sources to supply funds is the probability that they may fail to get their money back and that when they approach the courts the courts may not be efficient enough to deliver justice. We assessed contract enforcement efficiency in SSA and found that contract enforcement is inefficient in SSA as compared to other countries or regions. For example, in SSA it takes a creditor an average of 434 calendar days to recover debt (as compared to 27 days in developed economies). The creditor, who has to go through 37 procedures (as compared to 11 in developed economies), also incurs 41.6% (as compared to 4.2% in developed economies) of the claimed amount of debt as the cost of recovering the debt.

Appendix A 2.0

Stock Exchanges in Africa, by Year of Establishment

Country	Year Established	Name of Stock Exchange
Botswana	1989	Botswana Stock Exchange (BSE)
Ivory Coast	1976	Abidjan Stock Exchange ³⁶
Egypt	1988	Cairo and Alexandra Stock Exchanges
Ghana	1989	Ghana Stock Exchange (GSE)
Kenya	1954	Nairobi Stock Exchange (NSE)
Malawi	1995	Malawi Stock Exchange (MASE)
Mauritius	1988	Mauritius Stock Exchange (MSE)
Namibia	1992	Namibia Stock Exchange (NASE)
Nigeria	1960	Nigeria Stock Exchange (NISE)
South Africa	1887	Johannesburg Stock Exchange (JSE)
Swaziland	1990	Swaziland Stock Exchange (SSE)
Tanzania	1996	Tanzanian Stock Exchange (TASE)
Morocco	1929	Casablanca Stock Exchange (CSE)
Sudan	1995	Khartoum Stock Exchange (KSE)
Mozambique	1999	Maputo Stock Exchange (MPSE)
Tunisia	1969	Tunis Stock Exchange (TSE)
Uganda	1997	Uganda Stock Exchange (USE)
Zambia	1994	Lusaka Stock Exchange (LUSE)
Zimbabwe	1896	Zimbabwe Stock Exchange (ZSE)

Source: UNDP (2003) and Murinde (2006)

³⁶ The Abidjan Stock Exchange was closed in 1997 upon the establishment of the regional stock exchange in West Africa, Bourse Regionale des Valeurs Mobilières.

CHAPTER 3

CAPITAL STRUCTURE DETERMINANTS IN SUB-SAHARAN AFRICA

3.1 Introduction

The question of capital structure has received a lot of attention from economists for quite sometime³⁷. More than forty years have elapsed since the publication of Modigliani and Miller's (1958) seminal paper and yet the debate is still on³⁸. Myers (1984)³⁹ argued that we do not know how firms choose capital structure. Rajan and Zingales (1995) argue that even though empirical work has unearthed some stylized facts on capital structure choice the evidence is largely based on US firms. If the debate on capital structure is still unsettled in the developed countries it goes without saying that not much is known on how firms in Africa raise capital. According to Prasad *et al.* (2001), the private sector in most African countries is still in its embryonic stages of development⁴⁰. This research seeks to fill this gap and so increase our understanding of the behaviour of firms in Africa on how best they can raise capital under different macroeconomic and institutional environments. The research also seeks to unearth possible differences between the way firms in Africa raise capital in comparison to those in emerging markets and developed economies.

The debate on capital structure has however excluded or paid little attention to most emerging economies especially those in Africa. As a result there is dearth of literature on how firms in Africa raise capital. This study seeks to extend the debate to include less developed countries especially in Africa, as the debate would not be complete without the inclusion of those firms found in Africa⁴¹.

³⁷ Capital structure theories basically attempt to explain the mix of debt and equity and financing sources used to finance real investment by firms (Myers, 2003).

³⁸ The publication by Modigliani and Miller (1958) is believed to have seen the beginning of corporate finance as a discipline. It saw a number of theoretical and empirical studies being conducted including those by: Miller (1977), Myers (1984), Mackie-Mason (1990), Graham (1996), Jensen (1986), Harris and Raviv (1991), Jensen and Meckling (1976), Titman and Wessels (1988), Rajan and Zingales (1995), Ross (1977) among others.

³⁹ Myers (2001) goes on to say that there is no universal theory on capital structure and there is actually no reason to expect one.

⁴⁰ Most African countries are however privatizing and have established stock exchanges. This has seen an expansion of the private sector.

⁴¹ The countries to be looked at are Ghana, Kenya, Nigeria, South Africa and Zimbabwe.

The Sub-Saharan African (SSA) countries chosen are of interest for a number of reasons. Firstly, the countries chosen are some of the few countries in SSA with established stock exchanges and relatively established private sectors. Secondly, most studies on capital structure are on firms operating in developed economies especially the US⁴². The environment in which the firms in developed countries operate is different from that in which the firms in African countries operate. It is characterized by well functioning stock markets that have competitive, efficient and large banking sectors. Such efficient capital markets do not only facilitate the efficient transfer of funds from surplus to deficit units, they also facilitate the monetary policy transmission mechanism. The legal environment in most developed economies is also well developed so as to promote the sanctity of property rights, such that the creditors and shareholders are protected⁴³. The firms from the developed economies are also relatively large as compared to those from the developing countries like those in SSA (Collier and Gunning, 1999; Mutenheri, 2003; Mazumdar and Mazaheri, 2003). Because African firms are small and thus less diversified, they are exposed to shocks emanating from policy uncertainty and the vagaries of the macroeconomic environment.

On the other hand, capital markets in developing economies, in general, and SSA in particular, are inefficient, thin and small (Aryeetey and Nissanke, 2003; Mutenheri, 2003). Governments in these economies also have high propensities to intervene in such markets – especially through directed lending where they identify so-called strategic sectors and allocate to them cheap funds for investment⁴⁴. It is therefore likely that some factors that affect capital structure in less developed economies may not necessarily be critically important for firms in developed economies. (For example, Chen (2004) found that because of the institutional environment in which Chinese firms operate, they follow

⁴² See for example Mackie-Mason (1990), Graham (1996), Harris and Raviv (1991), Titman and Wessels (1988), and Rajan and Zingales (1995).

⁴³ One has to note that even in developed economies like the US there are some loopholes that can see the expropriation of wealth from shareholders to management. See for example, the Enron debacle in the US and the Brett Kebble crisis in South Africa. (Sergeant, 2006).

⁴⁴ In Zimbabwe, for example, an agricultural bank was established specifically to support new farmers. A private sector funding facility was also established to ensure survival of firms in the private sector (Reserve Bank of Zimbabwe, 2006).

what he called a “new Pecking Order” which is different from the pecking order theory postulations as promulgated by Myers and Majluf (1984))⁴⁵.

The inclusion of several African countries for such a study provides an opportunity for a comparison among African countries as well as between African and western or emerging countries. To the extent that African countries are similar to the western or emerging countries they provide us with independent samples to test the capital structure theories and to the extent that they have different institutional structures this will increase economists’ ability to discriminate among the alternative theories and thus enable them to come up with theories that apply to the African context.

3.2. Research Questions

The major research questions for the study are:

- What are the main factors that affect the way firms in Africa raise capital?
- Are there any differences between African firms, on one hand, and firms from developed and emerging markets on the other, when it comes to raising capital? (That is, is there an African dummy that significantly affect the capital structure in Africa such that conventional models may not be the best specifications?).
- Are there any differences among firms in Africa when it comes to their capital raising strategies?
- Do heterodox variables like education of management, export status of the firm and ethnicity of the majority owner affect the way firms in Africa raise capital?

3.3. Objectives of the study

The main aim of the study is to analyze capital structure determinants of firms in Africa.

To this end, the following objectives have been set:

1. To investigate the determinants of capital structure in Africa by looking at the debt/equity divide. The aim here is to examine the determinants of capital structure by looking at the determinants of leverage for firms in each of the sample countries.

⁴⁵ Chen (2004) argues that Chinese firms raise finance via the following order: retained earnings, then equity, and lastly debt.

2. To compare the ways in which firms in Africa are raising capital among themselves as well as vis-à-vis firms in developed and emerging economies.
3. To assess whether the capital structure theories developed with firms in developed countries in mind are applicable to African firms.
4. To make relevant policy recommendations to enhance the financing and growth of firms in Africa.

3.4 Scope of the study

The study largely focuses on listed firms in Ghana, Kenya, Nigeria, South Africa and Zimbabwe. The choice of the countries is based on data availability. Most studies of this nature concentrate on the listed firms as the units of analysis (Myers, 2003). The reason is that such firms have a wider choice of sources for raising capital. Concentrating on firm-level data enables us to analyze and investigate some issues that would be difficult to delineate and understand at a macro-level. Where available, the data covers the 1990-2005 period. To investigate the impact of heterodox variables on how firms raise capital we utilize the World Bank's Investment Climate survey data sets.

3.5 Justification of the study

The slow growth of and failure of African economies to catch-up with the developed or emerging economies has received a lot of attention in the literature (see Wheeler, 1984; and Collier and Gunning, 1999). Such slow growth implies that the majority of the people living in abject poverty are located in Africa⁴⁶. One sector whose growth is critical for the development of African countries is the private sector. The growth of the private sector can help reduce unemployment, increase the tax base for governments and facilitate economic growth. Ultimately such growth, if equitably shared, would reduce poverty. The increase in government revenue has positive effects as it reduces government deficits. The government revenue gained, thanks to the growth of the private sector, can also be used by the government to directly combat poverty.

⁴⁶ A fifth of the world's population lives in abject poverty. A significant number of them come from Africa. They survive on \$1 (US dollar) per day. Unemployment is very high such that even in better performing economies like South Africa it is in the region of 25% – 40%, depending on whether one is using strict or expanded definition of unemployment. In Africa those that work have their own problems too; a number of them receive incomes that are far below the poverty datum line. African culture also implies that whoever is working also provides for the extended family. This increases the number of dependents who have to share the earnings, exacerbating the problem. The private sector growth can serve as an engine for growth and absorb the unemployed and thus alleviate poverty.

As privatization gains momentum in most African countries the private sector inevitably expands. There is therefore a need to understand the behaviour of African firms in general. A better understanding of the firm in general is important in the context of Africa especially given African governments' propensity to intervene in their economies.

A better understanding of the problems faced by the private sector as it metamorphoses from its embryonic state is of great importance. For example, what are the factors that cause the slow growth that is pervasive in a number of African countries? A firm graduates from small to medium-scale and finally to large-scale. What factors can trap firms to remain small? According to Collier and Gunning (1999), by international standards African firms are small and slow-growing. One problem faced by firms in Africa identified in the literature is that of access to finance. In this particular study, we shall zero in on the behaviour of firms when it comes to raising capital. A better understanding of this issue can help policy makers identify the constraints that the firms may be facing in their attempt to raise capital for investment. For example, firms in emerging markets have been found to make heavy use of short-term debt. Is this a choice for them or they have no option?

While focus is on listed firms, survey data from the World Bank is also used where applicable. This shall be done to capture the heterodox variables that are germane to the African environment. Focusing on the listed firms helps us in the sense that most of the listed firms have a number of alternative sources of funds to choose from. We also focus on five Sub-Saharan African countries which have accessible data.

3.6 Literature Review on Capital Structure – Debt/Equity Divide

This section provides a brief literature review on capital structure. It starts with a survey of the theoretical literature on capital structure and then looks at the empirical literature. While the orthodox literature shall receive sufficient coverage, emphasis shall be on the empirical studies conducted in developing economies especially in African economies.

3.7 Theoretical Determinants of Capital Structure

3.7.1 The Modigliani and Miller Propositions

Modigliani and Miller (1958), assuming perfect capital markets, established the well-known Modigliani and Miller propositions I and II (hereafter referred to as MM I and MM II, respectively). According to the MM I, the market value of a firm is independent of its capital structure⁴⁷. This means that the mixture of debt and equity sources of funding does not affect the market value of a firm. In this context debt and equity, as sources of capital, can be considered to be perfect substitutes. In other words, the value of the firm is determined on the left hand side of the balance sheet (that is real assets side) and not by the proportion of debt and equity issued by the firm. That is, as long as the left hand side of the balance sheet is constant, tinkering with the right hand side will not affect firm value.

Modigliani and Miller's second proposition (MM II) states that the expected return on equity changes linearly with the debt-equity ratio. According to the proposition, the expected return on equity is equal to the expected return on the equity of an unlevered firm plus a premium related to the financial risk equal to the debt-equity ratio times the spread between return on equity of an unlevered firm and return on debt (Brealey and Myers, 1988; De Matos, 2001; Myers, 2003; and Grinblatt and Titman, 2003). Essentially, the MM II shows us that an attempt by the firm to increase the amount of debt and correspondingly reducing the more expensive equity does not reduce the overall cost of capital. This is so because as the firm borrows more, the risk of default increases thus lenders will demand higher interest rates. As this happens the expected return on equity will fall such that an increase in the interest rate (return on debt) will be accompanied by a fall in the return on equity that is just enough to keep the cost of capital constant. Hence there is no magic in leverage (Myers, 2003).

3.7.2 Trade-off theory

After the Modigliani and Miller (1958) seminal paper, there was an influx of papers that sought to either validate or invalidate the Modigliani and Miller propositions. Realizing the restrictive assumptions upon which the propositions were based most papers relaxed a

⁴⁷ Almost two decades later Miller (1977) was to reiterate the same in the context of corporate and income taxes.

number of such assumptions. Some introduced taxes, some introduced bankruptcy costs while others sought to analyze the impact of introducing financial distress and non-debt tax shields like depreciation (De Angelo and Masulis, 1980)⁴⁸. The trade-off theory essentially arose due to the relaxation of such assumptions.

According to the trade-off theory, value-maximizing firms choose the level of debt by balancing tax benefits of debt against the costs associated with debt such as bankruptcy and agency costs (Berens and Cuny, 1995; Myers, 2003). In perfect capital markets, how a firm raises capital is irrelevant to the value of the firm. However the possibility of bankruptcy costs and financial distress and the inclusion of taxes imply that the Modigliani and Miller's irrelevance propositions do not apply in reality⁴⁹. In a follow-up to their 1958 article, Modigliani and Miller (1963) introduced corporate taxes and their conclusion was that to maximize its value, a firm should actually have 100% debt. The corner solution implied by the Modigliani and Miller model is, however, at odds with the empirical behaviour of firms. Since then the important question has been why are firms not using 100% debt to finance their activities? Research effort has focused on trying to identify costs associated with debt financing, which firms tend to trade-off against the tax benefits (Berens and Cuny, 1995).

The realities imposed by the environment in which firms operate means that the firm may not have 100% debt. The existence of corporate and personal taxes, bankruptcy costs, agency costs, asymmetric information as well as non-debt tax credits means that the capital structure of the firm is relevant in determining its value and also that firms would not use 100% debt⁵⁰. Hence the trade-off theory tells us that firms must choose a target

⁴⁸For example, Kim (1978) used mean-variance analysis to show that when firms are subject to costly bankruptcies, corporate debt occurs at less than 100% debt. Brennan and Schwartz (1978)'s findings after including corporate taxes and bankruptcy cost in the Modigliani and Miller framework also reinforces the thinking that firms cannot have 100% debt to finance their capital structure. According to Brennan and Schwartz debt issue has two effects on firm value. Firstly it increases tax savings and secondly it reduces a firm's probability of survival. So depending on the relative strengths of the two, the value of the firm may actually fall or rise due to debt issue. Graham (2000) however, found that firms in the US could actually increase their value by 7.5% if they took advantage of the tax advantage.

⁴⁹Financial distress refers to the costs of bankruptcy and reorganization and also to the agency costs that arise when a firm's creditworthiness is in doubt (Myers, 2001).

⁵⁰It must, however, be noted that even in the presence of corporate and personal taxes, Miller (1977) managed to show that it is still possible to have a scenario whereby the financing decision of the firms would not affect firm value. Such a situation occurs when the Miller equilibrium obtains.

debt ratio towards which they slowly move (Myers, 1984, 2003). The trade-off theory yields an interior optimum solution for firms. According to Berens and Cuny (1995), the trade-off theory gives the rationale for cross-sectional variation in corporate debt ratios. This implies that firms with different characteristics will have different debt ratios. Furthermore, even those firms with the same target debt-to-equity ratios may have different observed debt-to-equity ratios. According to Myers (1984), this occurs because of the presence of adjustment costs. As firms move from one debt-to-equity ratio to another, they incur costs. Hence there will be lags in adjusting to the optimum. Some random events may push firms away from the optimum. The trade-off theory also triggered off the search for the optimal capital structure. According to the trade-off theory, the value of the firm is as follows (Myers, 2003):

$$\text{Firm Value} = \text{Value of Unlevered Firm} + \text{PV (interest tax shields)} - \text{PV (cost of financial distress)}.$$

Where: PV (interest tax shields) = present value of interest tax shields.

PV (costs of financial distress) = present value of the cost of financial distress.

In this case the firm chooses the level of debt that maximizes its value. The optimal capital structure occurs where the marginal benefit of increasing debt by an additional unit is equal to marginal cost of increasing debt by the same unit. It is important to note that as the firm increases its debt level the probability of bankruptcy and financial distress also increases. This explains why, in reality, there is moderate, cautious borrowing as opposed to 100% debt. It must also be noted that in reality it is impossible to obtain debt financing unless creditors believe that there is sufficient equity cushion (Baxter, 1967).

Even though firms may not have 100% debt there are a number of studies that support the fact that firms favour debt. These include Modigliani and Miller (1966), Baxter (1967), Mackie-Mason (1990) and Graham (1996). Mackie-Mason (1990), using a probit model, found that tax-paying firms favour debt. Graham (1996) used annual data from 10 000 firms in the US for the years 1980-1992 and found that high tax rate firms use more debt

as compared to low tax rate firms. He also found that changes in long-term debt are positively related to the firm's effective marginal tax rate, showing that taxes affect financing decisions. Modigliani and Miller (1966) also found that tax shields contributed significantly to the market value in a sample of US electric utilities. Baxter (1967) also supports trade-off theory, he maintains that firms have low levels of debt because high debt levels imply higher interest rates and higher debt-equity ratios increase the probability of default. So, while debt issue can increase tax savings it also reduces the firm's probability of survival (Brennan and Schwartz, 1978).

A number of authors have however found evidence that is not in line with the trade-off theory postulations. These include Long and Malitz (1983), Bradley *et al.* (1984), Titman and Wessels (1988), Fischer *et al.* (1989), Rajan and Zingales (1995), Fama and French (1998) and Wald (1999). Fama and French (1998) examined a large sample and found no significant link between taxes, financing and market value. Wald (1999) studied US, UK, Germany, French and Japanese firms and found that profitability was a very significant factor in determining the debt-assets ratio. He found that most profitable firms tend to borrow less. But if a firm aims to exploit tax shields as per the trade-off theory then we should expect firms with higher profits to have higher debt level because a firm with higher profits would have more taxable income to shield than one with less profits. The same firm with high profits would also find it easy to service debt without risking financial distress. So while trade-off theory seems to tell us that profitability and debt ratio must be positively correlated, a number of studies find evidence to the contrary. Rajan and Zingales (1995) found a negative relationship between profitability and debt ratios for firms in the US, UK and Canada. Long and Malitz (1985) also failed to find plausible evidence to support the predictions of the trade-off theory. Titman and Wessels (1988) used a factor-analytic technique to estimate the impact of different factors on corporate debt ratios and found that there is a negative relationship between past profitability and current debt levels.

In order to establish optimal debt in an imperfect market we need to measure bankruptcy costs. Bankruptcy costs are however difficult to measure. Bankruptcy costs can be

classified into two categories: direct and indirect bankruptcy costs. According to Grinblatt and Titman (2002), direct bankruptcy costs relate to the legal and administrative costs incurred when the firm is being reorganized while indirect bankruptcy costs are not directly related to the reorganization. But are bankruptcy costs significant enough to make trade-off theory work? According to Warner (1977) and Andrade and Kaplan (1998), bankruptcy costs among US firms are not significant enough. For example, Andrade and Kaplan looked at highly leveraged firms that fell into distress and found that the bankruptcy process was efficient and thus less costly. In a study of the US railroad industry's bankruptcies, Warner (1977) found that direct costs of bankruptcy were practically trivial. According to Warner (1977) and Andrade and Kaplan (1998), such costs were not significant to influence firm behaviour when it comes to raising capital. Altman (1984) however argued that the inclusion of indirect costs into the picture actually makes bankruptcy costs larger and can influence firm behaviour. Firms may also restrain themselves from issuing debt to maintain financial slack in the form of reserve borrowing (Myers, 1984).

Another important reason why firms may have less than 100% debt is because of conflict of interests between debtholders and shareholders. There is always a possibility of wealth expropriation of debtholders by shareholders. Because of that, before lenders offer their funds they tend to require debt covenants to prevent and protect themselves from such expropriation. Such covenants may require the firm not to exceed a certain debt/equity ratio. Firms may therefore be afraid of suffering from debt-overhang which occurs when they have a substantial amount of existing debt with covenants that prevent them from issuing additional debt that is senior to the existing debt (Grinblatt and Titman, 2002).

3.7.3 Information asymmetry theories

In this section the balance between debt and equity is described in the context of information asymmetry – the outsiders and the insiders have different information concerning the value of the firm. A number of models have been developed in this regard: Ross (1977), Leland and Pyle (1977), Myers and Majluf (1984) and Narayanan (1988). Realistically, most, if not all, models in this section assume that managers have better information about the value of the firm than the market. According to Arkelof

(1970), Leland and Pyle (1977), Varian (1992) and De Matos (2001), the main problems associated with information asymmetry are that if there is no flow of information the market may fail to exist, and that information cannot be credibly transferred directly. Information cannot be transferred directly because the management only makes information public if they hope to benefit from that. But outsiders are aware of this so they will not accept any information transmitted this way (De Matos, 2001). According to De Matos, if management claims positive qualities, no information is transmitted. To be credible the transfer of information must imply some losses to the informer. Such losses must, in equilibrium, be offset by the advantages of passing on the information.

According to Akerlof (1970) and Leland and Pyle (1977), in the absence of information flow, the market may fail to exist or it may perform poorly. In other words, in the absence of information transference, the market will value projects as average-quality projects. This undervalues above-average projects. The above-average quality projects will not participate if they are undervalued, resulting in an oversupply of low-quality projects. But in the absence of above-average projects the true average is now lower than the average initially used by the market. The market will thus revise its average, taking into account the non-participation of the above-average quality projects. This forces those projects that are above the new average not to participate. The process continues and at each stage leaving lower than average quality projects. This increases the costs of capital to finance the projects that are eventually funded. With such a high cost even better projects about which information asymmetry is small may not be financed.

Given the above, signaling can play an important role. Firms may try to signal their true value through debt levels. Ross (1977) provides a model in which the firm signals its value through the total amount of debt issued. Ross assumed that management compensation depends on the value of the firm. The value of the firm is in turn affected adversely by bankruptcy possibility. So if we classify firms into high-quality and low-quality firms, the managers can use the debt levels to signal quality; with high-quality firms taking on high levels of debt as compared to low-quality firms. Low-quality firms must take lower levels of debt because they must take into account the possibility or

threat of bankruptcy. While beneficial at equilibrium, signaling for the management is not costless. Ross proposes a fee schedule that includes a penalty on management if the firm goes bankrupt and the firm value fails to cover debt. The schedule also includes some benefits for signaling correctly. Ross' model implies that the value of the firm will rise with leverage, since increasing leverage increases the market's perception of the firm's value.

One important criticism of Ross's model is that managers are not allowed to deal in their shares. If they were allowed that option there would be an incentive for them to signal in such a way that the value of the firm would increase, and then they would cash up (De Matos, 2001). Leland and Pyle (1977) use a signaling approach similar to Ross' but they assume that the business is owner-managed. They show that an entrepreneur's willingness to invest in his own project can serve as a signal of project quality; with the value of the firm increasing with the share of the firm held by the entrepreneur. In this case the financial structure of the firm will be related to firm value even when there are no taxes. Thus the perceived firm value increases with the debt level, confirming Ross' results. Ross also found that firms with riskier returns will have lower debt levels even in the absence of bankruptcy costs.

3.7.4 Pecking Order Theory

The pecking order theory (POT) is attributed to Myers and Majluf (1984) and Myers (1984). Similar work is however said to have been done by Donaldson as far back as 1961, though Donaldson did not mention the pecking order theory as we know it today (Prasad, Murinde and Sanjiva, 2001; Myers 1984).

There is always information asymmetry between the capital market and the firm (Myers and Majluf, 1984; De Matos, 2001; Frank and Goyal, 2003). Such information asymmetry can affect the level of investment in a firm. An important contribution to this strand of literature is Myers and Majluf (1984). According to Myers and Majluf the existence of information asymmetry between investors and the firm's insiders results in mis-pricing of the firm's equity. This may in turn result in the rejection of positive net present value (NPV) projects. As a result of information asymmetry there is a pecking

order such that firms, in a bid to avoid the high external costs caused by information asymmetry, prefer internal funds to external funds and if there is any need for external funds they will go for debt rather than equity. According to Myers and Majluf (1984), the market tends to conclude that the shares of an issuing firm are over-valued, this in turn leads to lower proceeds for a share issuing firm. The important fact here is that managers, acting in the interests of existing shareholders, will only issue shares when they are overvalued. Issuing under-priced shares would actually result in the transfer of wealth from old to new shareholders. Since the market is aware of this, an issue of shares by a firm will thus be construed as a signal that the shares are overvalued, or as bad information about issuing firms' quality. The result is that the price of shares tends to fall after a share issue. This can be so severe as to force the managers to pass-up positive NPV projects. Due to the importance of the POT in this particular study the following section will provide a summarized version of the pecking model as developed by Myers and Majluf.

Myers and Majluf (1984) assume that the market is perfect in all respects except that there is information asymmetry in the sense that the insiders (the management) have information advantage over the outsiders (investors). They assume that management acts in the interests of existing shareholders. They also assume that the existing shareholders are passive; they do not rebalance their portfolios in response to the firm's decision to issue or not issue shares.

3.7.5 A model of pecking order theory

Let **I** and **S** be the required investment and financial slack of the firm, respectively. If **I** is smaller than **S** then the firm can use its financial slack to finance the investment. But if **S** is smaller than **I** then the firm must get the additional amount to invest from an external source. Let the amount of equity that the firm can issue if **I** is greater than **S** be **E**. Thus:

$$E = I - S \quad (1)$$

The model assumes three time periods: time -1, time 0 and time +1. At times -1 and +1 information is symmetric in the sense that both the market and the management have the

same information, while at time 0 there is information asymmetry in the sense that the management has more information than the market. When in time -1 the value of assets in the next period is not known with certainty, so at time -1 the possible value of assets of the firm at time 0 is described by a random variable $\hat{A}$. The possible NPV of the investment opportunity at time 0 is $\hat{B}$.

Now, at time 0 management knows the realizations of $\hat{A}$ and $\hat{B}$. These known realizations were denoted as **a** and **b**, respectively by Myers and Majluf (1984). At this stage the only information that the outsiders have is that if required investment is smaller than financial slack no issue of equity will occur, but if the required investment is greater than the financial slack the firm is going to issue equity to the tune of $I - S$. That is,

$$E = \text{Max}(0, I - S) \quad (2)$$

Let P and P' be the market share values of old shareholders, at time 0, if no shares are issued and if shares are issued, respectively. Let V_{old} be the value of all shares for the old shareholders. If management decides not to issue equity then the firm is still owned by the old shareholders with a value equal to:

$$V_{old} = a + S \quad (3)$$

If management decides to issue equity then firm ownership is shared between the old and the new shareholders. The total value of the firm will then be the sum of issued equity **E**, financial slack **S**, assets of value **a** and the net present value of the investment opportunity, b : $(E + S + a + b)$. The old shareholders will have a unit proportion $\frac{P'}{P' + E}$ of this amount. This means the value of the firm for the old shareholders is:

$$V_{old} = \frac{P'}{P' + E} (E + S + a + b) \quad (4)$$

Since the management is acting in the interests of old shareholders they will only issue shares if the old shareholders are better off with the new issue than without it. Hence they will only issue shares if:

$$\frac{P'}{P' + E}(E + S + a + b) > a + S, \text{ which is the same as; } b > -E + \frac{E}{P}(a + S).$$

According to De Mattos (2001), what the second inequality does is to demarcate the joint distribution of $\hat{A}$ and $\hat{B}$ into two joint regions. In one region the firm will issue equity because the shareholders would be better off with the issue but in the other region the management will not issue equity because old shareholders would be worse with the issue.

Given the information asymmetries of the model as well as the desire by management to serve the interests of existing shareholders, Myers and Majluf (1984) showed that the price of shares will drop after an equity issue. Additionally, the authors show that firms will issue debt (which is not encumbered by such information costs) before issuing equity, hence establishing the well known pecking order theory.

When either debt or equity is issued at time 0 there are gains and losses that will be realized at time $+1$ when all information is eventually revealed to the market. The reason why the gain can be positive or negative is because both equity and debt are considered to be risky assets. But because equity is riskier than debt the capital gains/losses are always less in absolute terms when issuing debt than when issuing equity. Hence managers, protecting the old shareholders, will always issue debt rather than equity. According to De Matos (2001), the POT results from the fact that debt and equity have different information sensitivities which imply different adverse selection costs, with these costs being greater when equity is issued. The POT explains why a significant amount of external financing comes from debt (Myers, 2001). The theory also explains why more profitable firms borrow less. This is because profitable firms have more retained earnings which they can use when the need arises and thus do not resort to the use of debt that

quickly as compared to less profitable firms. Less profitable firms are thus expected to have higher debt ratios than more profitable ones.

A number of studies have tested the POT. Those that found evidence in support of the POT include: Kjellman and Hensen (1995), Shyam-Sunder and Myers (1999), De Miguel and Pindado (2001), Bontempi (2002), Fama and French (2002), De Modeiros and Daher (2004), Mayer and Sussman (2004), and Flannery and Rangan (2006). One approach of testing the POT is to look at firms that issued shares and see if the values of shares drop after an equity issue. If that occurs then that would be confirming the POT postulations. For example, Smith (1986) found that on average new equity would result in a fall in the prices of share. The other approach, used for the first time by Shyam-Sunder and Myers (1999), is to look at changes in debt and see whether it is driven by financial deficit. If it is, then that would be a confirmation of the POT.

Shyam-Sunder and Myers hypothesized that there would be a one-to-one relationship between financial deficit and changes in debt⁵¹. Chirinko and Singha (2000) later called this the strong-form hypothesis. Shyam-Sunder and Myers called the coefficient on the financial deficit variable the pecking order coefficient. Using a sample of 157 US firms for the period 1971-1989, Shyam-Sunder and Myers found that POT offered the best explanation of the firms they covered than the simple debt-equity target adjustment model. Chirinko and Singha (2000) critiqued the Shyam-Sunder and Myers' findings by arguing that their simple test generates misleading results since it was cast in strong form as opposed to semi-strong form. Chirinko and Singha note that the semi-strong form would not require the coefficient of the deficit to be one but rather just less than but close to one.

Kjellman and Hensen (1995) conducted a survey on listed firms in Finland and found that managers of the listed firms tended to follow the pecking order theory. Miguel and Pindado (2001) tested the POT using 133 listed Spanish firms and found evidence in

⁵¹ According to Shyam-Sunder and Myers (1999), a one-to-one relationship between financial deficit and changes in debt imply that a firm is financing its investment activities using debt.

support of the pecking order theory. Bontempi (2002) proposed an empirical model for the modified POT in which both the POT and the trade-off model are nested. Using 20 152 Italian firms for the period 1985-1995 he found that a modified pecking order model is suitable for explaining capital structure behaviour in Italy. Further, he noted that there was widespread use of retained earnings for investment by the Italian firms. Fama and French (2002) looked at 3000 US firms for the period 1965-1999 and found that short-term variation in investment and earnings is mostly absorbed by debt, confirming the POT postulations.

Using a sample of listed Brazilian firms, De Medeiros and Daher (2004) tested both the POT and trade-off theory and found that the POT provides a better explanation of capital structure behaviour of the firms. Mayer and Sussman (2004) looked at the financing of large and indivisible projects and found that POT tended to work in the short run while the trade-off model tended to work in the long run. They however rejected the hypothesis that internal funds play a major role in funding investment.

Fama and French (2005) and Frank and Goyal (2003) found evidence contrary to the POT predictions. Fama and French (2005) covered US firms for the period 1973 -2002. They found that equity issues are common place and that equity repurchases are not rare as predicted by the pecking order theory. Their results rejected the POT predictions about the frequency and circumstances under which firms issue and repurchase shares. According to Fama and French, firms do not issue equity under duress rather; they can issue equity even when debt capacity has not been reached. Using US listed firms for the period 1971-1998, Frank and Goyal (2003) tested the POT and found that net equity tended to track the financing deficit more than does net debt issues. They also found that the pecking order model tended to work better for larger firms than for smaller firms. Even for the large firms the ability of the POT to explain the capital structure behaviour of firms was found to decline over time.

Narayanan (1988) further improved the Myers and Majluf (1984) model by using less restrictive assumptions. Myers and Majluf's model is based on the assumption of

information asymmetry regarding the proposed project as well as on the assets-in-place, thus it may not be easily applied to new firms. Narayanan solved this constraint by relaxing the asset-in-place assumption, thus POT's results can still hold even when there are no assets-in-place. Narayanan concludes that:

- i) issuing safe securities is better than risky ones
- ii) debt, even risky debt, is always better than equity
- iii) it is advantageous to the firm to use internal sources of capital as compared to external. So it is better to build up financial reserves, by restricting dividend payouts for example.
- iv) When equity is issued, the stock price will fall, since the market views any project with external equity as a "lemon".

3.7.6 Agency Cost Theories

In a modern corporation the separation of ownership and control is inevitable. Most firms are managed by managers (who may or may not own any shares in the firm) who operate as agents of shareholders. Such a relationship is fraught with agency problems. The shareholders and managers, consciously or unconsciously, serve their own interests. While shareholders would want to see the maximization of firm value, the management may want to maximize their own selfish interests. Such interests may force them to consume on the job at the expense of shareholders. Management, in an attempt to increase their payoffs at the expense of shareholders, can engage in opportunistic behaviour. There is a difference between the value of the firm in the absence of opportunistic behaviour and its value in the presence of opportunistic behaviour, with the former being higher than the latter. The reduction in the value of the firm due to opportunistic behaviour by management is termed agency cost (Jensen and Meckling, 1976; Demigurc-Kunt and Maksimovic, 1994).

The investors holding the securities of the firm are aware of the managers' opportunistic behaviour and thus take it into account when valuing the firm's securities. They will offer a lower price than when there is no opportunistic behaviour. It is thus in the interests of the residual claimants to choose a firm whose capital structure minimizes agency costs and thus maximize the firm's share price (Demigurc-Kunt and Maksimovic, 1994).

According to the agency theory, the observed capital structure of a firm should thus aim to minimize the potential for opportunistic behaviour in the firm. The extent of opportunistic behaviour depends on the environment in which the firm is operating. For example, an efficient legal system that protects investors' rights curbs opportunistic behaviour by management. In most developing economies the legal system is not efficient, thus there are high chances for opportunistic behaviour by management. Factors such as the legal system in a country, development of financial institutions and markets, and investors' incentives to monitor management, directly affect agency cost and thus the capital structure chosen by a firm.

Agency cost theories are relevant in an environment where investors are poorly protected. Weak institutional or legal protection of investors, as is common in most African countries, can impede external financing, forcing corporations to rely on internal funds and debt financing, especially bank debt (Myers, 2003). The widespread use of short-term debt by most firms in developing economies may be due to agency costs as well as high levels of inflation. Because of the separation of ownership there arise two important conflicts of interests: the conflict of interests between shareholders and management and the conflict of interests between debtholders and shareholders (Jensen and Meckling, 1976). The conflict of interests between shareholders and management arises due to the reasons given above while that between debtholders and shareholders arises due to moral hazard.

In this section, we look at these conflicts and on how the use of debt may solve the problem. We also look at the use of debt as a means of forcing the management to disgorge the free-cash flow that it would otherwise have used for empire building or for other wasteful activities (Jensen, 1986).

Jensen and Meckling (1976) consider a situation whereby the firm is initially wholly-owned and run by the manager. In this case there is no incentive for the owner-manager to consume on the job because he will bear the full costs of such personal benefits. If we however assume that the manager now owns a percentage μ ($\mu < 100\%$) of the firm, he

will have an incentive to increase his consumption of perquisites since he will only partly bear the costs of such consumption (the other costs being borne by the other shareholders). As μ increases the costs of perquisites consumption borne by management will rise, forcing management to lessen such activities. A fall in μ however implies an increase in perquisite consumption.

Given the above scenario, shareholders must monitor management. But in a real world it may be costly and/or difficult to monitor management. Shareholders may just want to benefit from the monitoring of management without doing the monitoring themselves. The reason for this is that the benefits of monitoring accrue not only to the monitoring shareholders but to all shareholders. Investors in capital markets are aware of this, and thus take it into account when valuing the shares of firms such that the value of firms characterized by principal-agent relationships would be lower than when there is no such conflict of interests (Jensen and Meckling, 1976). According to Jensen and Meckling, the use of debt may mitigate this problem. We have seen that one way of reducing the consumption of perquisites by management is to increase their shareholding. Another option is to hold the shareholding of management constant and use debt instead. The use of debt instead of equity, ensures that the costs of perquisite consumption remains internalized as in the case when the firm is 100% owner-managed (Myers, 2003).

Issuing equity creates an agency problem since the costs of perquisite consumption are borne partly by the new shareholders even though the full benefits are enjoyed only by the management. According to Myers (2003), this establishes another pecking order: this time because of the inherent conflicts of interest between shareholders and managers. In this case, firms would prefer internal finance over external finance and if they need external finance they will go for debt instead of equity. It must be noted that optimal capital structure can also be established from the Jensen and Meckling framework, as shall be explained below.

The use of debt can be very costly. For instance, an increase in debt is associated with higher probability of bankruptcy, which increases the cost of financial distress. Secondly,

the use of debt implies a conflict of interests between shareholders and debtholders. Thus, whilst the use of debt is beneficial in solving the problem of conflict of interests between shareholders and management, it creates conflicts of interest between shareholders and debtholders. For example, shareholders may want to expropriate the wealth of debtholders by, for instance, conniving with management, which is serving their interests any way, to embark on very risky projects that stand to benefit shareholders at the expense of debtholders.

So the inevitable separation of ownership and control of the firm implies agency costs associated with both external equity and agency costs of debt. The summation of the two gives us the total agency cost function. According to Jensen and Meckling, an optimal capital structure can be established by minimizing the total agency cost function.

Jensen (1986) supports the use of debt as a way of reducing the conflict between shareholders and management. He introduced the free-cash-flow hypothesis⁵². The hypothesis is premised on the fact that if management has a significant amount of resources in terms of cash flows, it may have too much power and it can waste such resources, worsening the conflicts between shareholders and management. There is thus a need to ensure that management does not have too much cash at its disposal. According to the free cash flow hypothesis, paying out free cash flows can help mitigate the conflict between managers and shareholders. One way to do this is by just paying the free cash flow to shareholders as dividends. But then management cannot credibly promise to pay out the free cash flow each time that it occurs. Jensen argues that the use of debt may be beneficial to the firm. He argues that if management has too much free cash flow at its disposal it may use it for empire building and so debt (being a contract that must be fulfilled, failure of which bankruptcy may be declared, adversely affecting management as well) may force management to efficiently use future cash flow rather than waste it.

So whilst high levels of debt ratios may be dangerous they can add value if they force management not to waste the firm's financial resources. According to Myers (2003), this

⁵² Jensen (1986) defines free-cash-flow as the cash flow over and above the amounts required to fund projects that have positive net present values.

means that leverage must depend on the investment opportunity set such that firms with valuable growth opportunities should choose low leverage so as to free up cash for expansion. Those firms with limited growth opportunities should operate high debt ratios to limit the wasteful behaviour of management.

Therefore, there are a number of ways of mitigating the conflict between insiders and investors:

- Issuing debt - Issuing debt rather than equity forces the insiders to contractually commit themselves to a given level of payment to investors (creditors), thus reducing opportunistic behaviour.
- Issuing short-term debt – Issuing short-term debt forces insiders to the renegotiation table periodically, thus making the issuance and payment of debt more like a repeated game in which the insiders are punished by the creditors if they are seen to be behaving in any way detrimental to the creditors.
- In addition to the above, the conflict of interest between equity holders and debt holders can be mitigated by designing debt covenants that protect the interests of debt holders. For example, debtholders may put some limits on the dividend payments or they can structure the debt contracts in such a way that any new debtholders may not be superior to existing ones.
- In the event that long-term debt is issued, it may be secured with specific assets. Thus, a firm with a strong capital base may be able to secure long-term debt as compared to a small firm.
- Another way is to just reduce debt levels in industries where the potential for opportunistic behaviour is high (Demigurc-Kunt and Maksimovic, 1994).

3.7.7 Summary of theoretical models

Table 3.1 below shows the determinants of the different capital structure models.

Table 3.1: Summary of Theoretical Predictions

Firm Characteristic	Impact on leverage⁵³	Reason	Model	Reference
Profitability	+	Pecking order hypothesis Improves ability of firm to borrow	Information asymmetry	Myers (1984), Myers and Majluf (1984)
Size	+	Less vulnerable to bankruptcy	Information asymmetry	Myers (1984), Myers and Majluf (1984)
Free-cash flow	+	Free cash flow hypothesis	Agency cost	Jensen (1986)
Growth opportunity	-	Underinvestment problem	Agency cost	Myers (1977)
Asset tangibility	+	Collateral	Agency cost	Jensen and Meckling (1976)
Risk	-	Bankruptcy costs	Trade-off	Bradley et al (1984)
Corporate tax rate	+	Tax deductibility	Trade-off	Modigliani and Miller (1958, 1963), Miller (1977)
Non-debt tax shield	-	Shields firm tax	Trade-off	De Angelo and Masulis (1980)

Adopted from Green and Mutenheri (2002)

3.7.8 Empirical evidence on factors influencing capital structure in developing economies

Empirical research on capital structure determinants in the African context can be divided into three categories: those that look at the financing patterns in developing economies, those that focus on econometric analysis using a specific country and those that include one or two African countries among a host of other developed or non-African economies to analyze capital structure issues. Those that have looked at corporate financing patterns in developing economies include Singh and Hamid (1992), Singh (1995) and Cobham and Subramaniam (1998). Those that have done single-country analysis and cross-country comparisons include; Negash (2002) on South Africa, Green and Mutenheri (2002) on Zimbabwe, Green, Kimuyu, Manos and Murinde (2002) on Kenyan small to

⁵³ Note that different authors used different measures of leverage.

medium scale firms; and Abor and Biekpe (2005) on Ghanaian listed firms. When it comes to analyzing and comparing the capital structures of the different firms in different African economies not much has been done. Those that have looked at a number of developed economies and included one or two African economies include Glen and Pinto (1994), Rajan and Zingales (1995), and Singh (1995). This study attempts to expand the single-country analyses on Africa by looking at a number of African countries. A better understanding of the capital structure behaviour of African firms would inform policy makers on how best a conducive environment and a better climate for investment can be created. The first part of the following section looks at the capital structure research done in developing economies, including African economies. The second part provides a summary of the findings.

Singh and Hamid (1992)'s paper is considered to be one of the pioneering papers that attempted to analyze capital structure behaviour in developing economies. They looked at India, South Korea, Pakistan, Thailand, Mexico, Malaysia, Turkey and Zimbabwe and found that the largest firms in these countries tended to use more external finance than those in the developed economies. They also found that they made more use of equity finance than firms in the developed economies. A robustness check of these surprising results was done by Singh (1995). Using a longer time period (1980-1990) and also including Brazil, Singh confirmed results by Singh and Hamid (1992). Cobham and Subramaniam (1998) did a follow-up on the work done by Singh and Hamid by concentrating on India alone. By including both listed and unlisted firms, Cobham and Subramaniam attempted to rectify the problem of sample selection bias. They found that India is not very different from countries like France and Italy. They argued that the Singh-Hamid results suffered from a sample selection bias as they concentrated on the 50 largest and quoted firms in India, noting further that their sample excluded the majority of Indian firms that were not using the stock exchange to raise capital but instead used other networks to raise a significant amount of external equity.

Using the same descriptive analysis as Singh and Hamid (1992)'s, Glen and Pinto (1994) looked at the nature of capital structure decisions in developing economies. They argue

that just like the firms in developed economies, the firms in emerging markets aim to minimize the cost of capital. They also seek to retain control in the hands of existing shareholders. They suggest that the variation of debt-equity ratios between developed and emerging markets may be due to the macroeconomic environment and government interventions. For example, firms may favour debt if the interest rates are controlled by the government, and high levels of inflation and the associated uncertainty may cause firms in emerging markets to be biased against long-term debt (Glen and Pinto, 1994). So the difference in capital structures may not reflect differences in firm characteristics only but they may also reflect the different macroeconomic environments in which the different firms find themselves. They posit that emerging market firms do not follow the Western-style pecking order, citing the case of Indonesia where firms rely on internal finance and state bank loans, then private and foreign banks and then finally on equity. This means the Indonesian pecking order is internal over external and if external funds are required then private and foreign debt from banks is preferred and finally equity. They also argue that the state banks play a significant role in providing finance, especially to small firms that may not have the requisite reputation and collateral to secure funding from private banks. Thus, such firms seek out state bank funding first before considering private bank debt.

Booth *et al.* (2001) looked at the capital structures in developing countries, using a sample of 10 countries (including both developed and developing countries)⁵⁴. They found that most developing economies have substantially lower amounts of long-term debt as compared to the developed economies.

Using company accounts data Green and Mutenheri (2002) looked at financing patterns of the corporate sector in Zimbabwe and found that listed firms in Zimbabwe relied heavily on external finance especially short-term financing. While long-term bank loans were found to make little contribution to the financing of the corporate sector, the stock market was found to contribute significantly. Asset tangibility, tax rate, growth

⁵⁴The countries are India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and , Korea.

opportunities, earnings volatility and bank liquidity were found to be significant determinants of capital structure.

Using a 1999 survey with 2000 Kenyan small to medium scale firms as well as a heterodox model that makes use of a number of non-conventional variables, Green *et al.* (2002) found that the measures of asset tangibility and the level of education of the owner of the business have a significant positive effect on the likelihood of borrowing as well as on the firm's leverage. The heterodox variables that they used include management ownership of the firm, education, property rights, and book keeping skills of the owners and managers.

In a study on capital structure determinants of Chinese listed, Chen (2004) found that the capital choice decisions of Chinese firms neither follow the pecking order theory nor the trade-off theory. Instead he found that the Chinese firms tended to follow what he termed a "new pecking order" in which a firm's preference for funds is retained earnings first, followed by equity and then long-term debt. He argued that while Western models tended to concentrate on firm characteristics as determinants of capital choice, models that seek to explain the behaviour of the determinants of capital structure in China must look at the institutional factors as these also play a very important role.

In a study of 8000 firms in 44 countries for a period of 1994-2000, Glen and Singh (2004) found that there are few differences in capital structure between emerging and developed economies markets than would be expected *a priori*. They found that emerging market firms have lower levels of leverage than do developed market firms. They also found that current liabilities financed a large portion of total assets than do long-term liabilities in both emerging and developed economies.

Using a panel data analysis, Abor and Biekpe (2005) looked at listed firms in Ghana for the period 1998-2003 and found that total debt constituted more than 50% of the capital of the listed firms. Upon using an eclectic model to test the different theories of capital structure, they found that their results generally supported the pecking order theory. Firm

size and growth were positively related to leverage while asset tangibility, risk, corporation tax rate, and profitability were negatively related to leverage. The sample that they used was however quite small as they used only 22 firms.

3.8 Hypotheses to be tested

In light of the theories explained in the literature review section, we formulate the following hypotheses:

Hypothesis 1: More profitable firms borrow less as compared to less profitable ones.

Hypothesis 2: High corporate taxation encourages firms to use more debt to finance their activities.

Hypothesis 3: Older firms borrow more as compared to young firms.

Hypothesis 4: Size is positively related to leverage.

Hypothesis 5: Firms in Africa use more short-term debt as compared to long-term debt.

3.9 Data and Methodology on Debt-Equity Divide

The present study looks at listed firms in Zimbabwe, South Africa, Nigeria, Ghana and Kenya. According to Myers (2001), most studies on capital structure focus on public, non-financial firms with access to capital markets. Myers argues that this is the right place to start since such companies have a broad menu of financing choices and can adjust the capital structure at minimal costs. The choice of the countries was based on stock market developments as well as on their financial systems. The data covers the period 1990-2004. Where the most recent data is not available a smaller time period is considered. In terms of methodology for testing the study's hypotheses, a combination of ordinary least squares (cross section) and panel data analysis is used. A great deal of descriptive statistics, graphs and trend analysis are used to highlight the development/evolution of capital and debt structures for firms in these countries. This is in line with the following argument by Kennedy (2002: 574):

The advantage of graphing is that graphics broadcast whereas statistics narrowcast..... The greatest value of a picture is when it forces us to notice what we never expected to see.

3.9.1 Data Sources

The data used for the study came from two major sources. The data on listed firms came from annual reports of listed firms. The annual reports were obtained from the stock exchanges of the respective countries. The second data set came from Investment Climate Assessment surveys conducted by the World Bank in South Africa, Kenya, Ghana and Nigeria. The data set from the annual reports was used to investigate the determinants of capital structure using mostly conventional variables. To better understand the capital structure determinants in African economies we also included some heterodox variables that are germane to the African environment. To do this we used the World Bank survey data. The data set also contains listed as well as unlisted firms. This helps us to explore the behaviour of listed vis-à-vis unlisted firms when it comes to raising capital for additional investment.

The data for the listed firms is from published company annual reports. All the stock exchanges of the sample countries require firms to publish company accounts each year. For South Africa the McGregor Database, which contains information on listed firms in South Africa is used while for the other countries the respective stock exchanges are the main source of the data. Most, if not all, stock exchanges keep audited annual reports of listed firms. The pertinent data mainly used is from the balance sheets and income statements of the firms.

The second data set came from the investment climate assessment surveys. This is a cross sectional data set based on firm surveys conducted by the World Bank. The advantage of the data from these surveys is that the same kind of questionnaire was used in the countries involved. This is important for comparability and benchmarking purposes⁵⁵. Other data sources for the other relevant variables include the World Bank, International Monetary Fund, International Finance Corporation databases as well as data from the statistical offices of the respective countries.

⁵⁵ See chapter 3 which makes exclusive use of this data set to investigate a separate but related issue.

The Kenyan firm-level survey was started in 2002 and completed in 2003. Initially it covered 386 manufacturing firms, which accounted for 20% of all formal firms in Kenya (World Bank, 2004a). But due to survey fatigue a number of firms refused to be interviewed, reducing the sample size to 282 firms (World Bank, 2004a). The sample, which included firms from Nairobi, Mombasa, Eldoret, Kisumu and Nakuru, was stratified across location, sub-sectors and size (World Bank, 2004a). The South African survey was conducted in 2004. A total of 603 manufacturing firms were included in the survey (World Bank, 2005a). The sample included firms from South Africa's main provinces: Gauteng, Kwa-Zulu Natal, Western Cape and Eastern Cape. The Ghanaian survey was conducted by the Centre for the Study of African Economies in 2002 as part of the World Bank's RPED. It covered 233 manufacturing firms. The sample included firms from Ghana's main urban areas: Accra, Kumasi, Takoradi and Cape Coast.

The survey on Nigerian firms was conducted in 2001. It consisted of 232 formal manufacturing firms that were spread in the following sectors, chemicals and paints, food and beverages, metal, non-metal, paper-printing-publishing, pharmaceuticals, plastic, textiles, and wood. It must be noted that the manufacturing sector in Nigeria is small. For example in 1999 it accounted for 5.9% of the country's GDP. When it comes to location of the firms the dominance of Lagos is quite evident. Firms located in Lagos accounted for 43% of the total firms.

Before use of the data, some data cleaning was done. Hamermesh (2000) argues that data cleanliness must be put ahead of econometric godliness. The data cleaning exercise was done to identify any inconsistencies in the data; for example, if any observations are impossible, unrealistic or suspicious (Kennedy, 2002). Problems like endogeneity and simultaneity were also checked for and rectified where necessary.

3.9.2 Debt-Equity Mixture Determinants

In order to assess whether capital structure theories modeled with firms in developed countries in mind are applicable across African countries, we start by developing an eclectic model that uses the predictions from the trade-off, agency and asymmetric information theories. This is then followed by an augmented model that takes into

account the fact that maybe there are some factors in African countries that may dictate differently the way African firms raise capital. Such factors include property rights, education of manager or owner of the firm, ethnicity of owner, whether or not the firm exports its products and gender of owner.

Panel data analysis is conducted not only to check the robustness of the above tests but also to take advantage of a panel's superiority over a cross-sectional or time series analysis. See Baltagi (2001) for the advantages of using panel data analysis over cross section or time series data.

3.9.3 Conventional Model

Following Rajan and Zingales (1995), Booth *et al.* (2001) and Abor and Biekpe (2005), conventional independent variables are used. These include asset tangibility, profitability, business risk, growth opportunities, firm size, and taxation. For each country a cross-sectional OLS regression analysis is used to assess the correlations of the determinants of capital structure to leverage ratio⁵⁶. The following equation encapsulates the estimated model:

$$Y_i = \alpha_i + \sum_i \beta_i X_i + \varepsilon_i \quad (5)$$

Where:

Y_i = capital structure measure for firm i .

X_i = explanatory variables for firm i .

Following Rajan and Zingales (1995), Johnson (1997) and Booth *et al.* (2001), the variables (with the exception of dummies and age) for this exercise are averaged. According to Rajan and Zingales (1995) and Johnson (1997) averaging helps to mitigate problems of extreme values in any one year. Booth *et al.* (2001) argue that averaging explanatory variables reduce noise and accounts for slow adjustment. Using past firm characteristics reduces the likelihood that observed relationships reflect the effects of the dependent variable on the independent variable. After determining the signs of the

⁵⁶ See Rajan and Zingales (1995) for different measures of leverage ratio.

necessary coefficients they shall be compared across the sample countries as well as with the stylized facts from developed economies.

3.9.4 Augmented Model (using Heterodox Variables)

This model takes the conventional model and augments it with non-conventional variables. The inclusion of the non-conventional variables is important in the African context because the environment in which the African firms operate is very different from that in which firms in developed economies operate. Factors such as education of manager or owner of the firm, ethnicity of owner, whether or not the firm exports its products, gender of owner and inflation, among others, may actually be important for a firm considering the different ways of raising capital. For example, the uncertainty caused by an inflationary environment may force firms to depend on short-term rather than long-term debt while problems emanating from poor property rights systems and information asymmetry may force firms to depend largely on internal finance. Thus we may have an “African Pecking Order” that may be different from the conventional one.

The data from the annual reports does not give information on the non-conventional variables described above. We therefore use investment climate assessment surveys from the World Bank to investigate the capital structure determinants. The World Bank data is cross sectional data collected from the surveys conducted in the South Africa, Ghana, Kenya and Nigeria. The data also includes both the listed and unlisted firms. This helps us to assess whether there is a difference between listed firms and unlisted firms when it comes to raising capital.

For this particular model, we use an incremental approach to investigate the capital structure determinants. That is, when a firm requires additional funds for investment does it use equity or debt sources to finance the investment? We look at the investments by the firms in the different countries a year prior to the survey. In two separate questions the firms that made additional investments were asked to state the sources of funds used to finance such investments as well as the amounts of such investments. The following categories were classified as equity; internal funds or retained earnings and issuing

additional equity. The following were categorized as debt; loans from banks, leasing arrangement, trade credit, loans from friends and relatives and loans from money lenders.

The model also includes conventional variables like age, size, asset tangibility and profitability as well as heterodox variables like education of manager, location of the firm, ethnicity and whether or not the firm exports its products. For purposes of this model the variables used are as defined in Table 3.2 below.

Table 3.2: Definition of Variables (Heterodox and Conventional Variables)

Variable	Definition
Leverage	Proportion of debt in the total new investments.
Age	Number of years since the incorporation of the firm.
Size	Number of employees.
Profitability	Sales ⁵⁷ .
Location	Dummy variable taking 1 if firm is located in the capital city or province (or province in which the capital city is located) and zero elsewhere.
Export	Dummy variable taking 1 if firm exports its products, zero otherwise.
Education	Dummy variable taking a value of 1 if manager's highest level of education is at least a university degree and zero otherwise ⁵⁸ .
Listed	Dummy variable taking a value of 1 if firm is listed and zero otherwise.
Ethnicity	Dummy variable taking a value of 1 if firm's majority shareholder is African and zero otherwise.
Audit	Dummy variable taking a value of 1 if firm is audited by external auditors and zero otherwise.

The augmented model is as follows:

$$Y_i = \alpha_i + \sum_i \beta_i X_i + \sum_i \gamma_i Z_i + \varepsilon_i \quad (6)$$

Where:

Y_i = capital structure measure for firm i .

X_i = conventional explanatory variables for firm i (i.e., age, size, profitability and asset tangibility).

Z_i = heterodox explanatory variables for firms i (i.e., education, ethnicity, listed, export and location).

⁵⁷ There is not much information to calculate the profit levels for the firms.

⁵⁸ The questionnaire asked for the highest education level of the head or top manager of the firm.

3.9.5 Modeling Capital Structure by Using Panel Data

A panel data set has several advantages over a cross section (for example, see Baltagi, 2001; and Greene, 2003). One of the advantages is that it allows greater flexibility in modeling differences in behaviour across individuals firms. That is, it allows us to control for unobserved cross-section heterogeneity (Wooldridge, 2002). To get a better understanding of firm behaviour over time the following panel data model is used, for $i = 1, \dots, N$ firms over $t = 1, \dots, T$ time periods:

$$Y_{it} = \alpha + \beta'X_{it} + \gamma'Z_t + \lambda'W_i + \varepsilon_{it} \quad (7)$$

Where:

Y_{it} = capital structure measure for firm i over a given time period t .

X_{it} = vector of explanatory variables for firm i over a given time period t (i.e., determinants that vary across time and firms). These include profitability, risk, asset tangibility, reputation, age and corporate tax.

W_i = vector of explanatory variables that vary across firms but are time-invariant (e.g., sector dummies, country dummies, highly risk-averse management, etc.)

Z_t = vector of explanatory variables that vary across time but are not firm-specific (e.g., stock market development, inflation, bank liquidity and availability of credit and a number of other macroeconomic variables).

$$\varepsilon_{it} = \mu_i + \eta_t + \nu_{it} \quad (8)$$

Where, ε_{it} is a composite error term. For each t , ε_{it} is the sum of unobserved effects and an idiosyncratic error term.

Given that there are a number of models that can be used for panel data analysis, including the fixed effect model (FEM), random effects model (REM) and pooled least squares model, the appropriate model depends on the structure of the composite error term and the correlation between components of the error term and the observed

explanatory variables. If there are no firm specific effects, $\mu_i = 0$, the composite error term is reduced to an ordinary error term. The pooled ordinary least squares approach is appropriate in that case. If the unobserved effect is such that $\mu_i \neq 0$ and there is a correlation between the unobserved effect and the observed independent variables then the pooled ordinary least squares approach is inappropriate, since there would be heterogeneity bias emanating from firm heterogeneity. The fixed effects model (FEM) can be used if it is assumed or expected that there are some unobserved fixed effects that may be correlated to the observed explanatory variables. The problem with the FEM is that the estimation procedure tends to reduce the degrees of freedom. Further, the FEM does not estimate the parameters of the time-invariant variables. This model may therefore be less useful if such variables are critically important for the model. The other model that can also be used is the random effects model (REM). The random effects model essentially put the μ_i into the error term. It assumes that μ_i is orthogonal to the independent variables. The REM estimator would however be inconsistent if μ_i is correlated to the independent variables.

Concerning the choice of the models, the FEM is probably more appropriate in this case because the cross section used in this case is an exhaustive one (all non-financial listed firms) rather than a random selection. If the cross section were drawn from a larger population such that the sample cross section may not be considered to be exhaustive then a REM may be appropriate. In this case the three models shall however be used and some tests shall be done to identify the appropriate one. The tests include the Hausman and the Lagrange Multiplier tests.

3.9.6 Definition of Variables

Leverage

The dependent variable in this case is leverage. According to Rajan and Zingales (1995), there are several ways of measuring leverage and the most relevant measure depends on the objective of the analysis. The measures of leverage include the ratio of total liabilities to total assets, ratio of total debt to total assets and ratio of total debt to net assets (that is,

total asset adjusted for depreciation). Each one of the above measures has a number of caveats and so choosing one measure over the other is dictated by the objective of the analysis. Rajan and Zingales (1995) used all the measures and then assessed whether the signs of the coefficients changed due to the use of a different measure. We use a similar approach here. The different measures that have been used in the literature are presented in Table 3.3 below.

Table 3.3: Measures of Leverage

Leverage Definition	Formula	Reference
Total debt to firm value ratio (book value)	Total debt divided by sum of total debt and book value of equity	Rajan and Zingales (1995)
Short-term debt to firm value ratio	Short-term debt divided by sum of total debt and book value of equity	Booth <i>et al.</i> (2001)
Long-term debt to total debt plus market value of equity	Long-term divided by sum of total debt and market value of equity	Mutenheri (2003)

Independent Variables

Informed by theory and extant empirical literature, we shall use the independent variables listed in the Table 3.4. For our purposes the independent variables are largely the firms' characteristics. The essence here is that firms differ and thus their preference for finance sources also differs. A number of independent variables have been considered and found important in the extant capital structure literature. These include asset tangibility, non-debt tax shields, investment opportunities, firm size, business risk, probability of bankruptcy, firm profitability and uniqueness of the product produced by the firm. (For more information on the different capital structure determinants see Harris and Raviv (1991), Rajan and Zingales (1995), Mutenheri (2003)). Of these, the most commonly used variables are firm size, reputation, business risk, profitability and investment opportunities. Asset tangibility is usually proxied by fixed assets of the firm divided by total assets, firm size by the natural logarithm of sales or total assets or the number of employees. Business risk is usually proxied by using the standard deviation of return on assets. Return on assets is itself used as a proxy of the firm profitability. The following section looks at several variables included in this study.

Profitability - From the pecking order theory, we know that profitable firms use retained earnings for additional investment and so they tend to use less debt⁵⁹. But a positive relationship between profitability and leverage can be argued for since the market is more likely to be eager to offer funds to more profitable firms than to less profitable ones.

Firm size - Firm size matters. According to Prasad *et al.* (2001), a firm's size can be viewed as a proxy for information asymmetry between the firm's insiders and the market, such that the larger the firm the smaller the information asymmetry and thus the smaller the costs caused by information asymmetry. This means that larger firms should be more capable of issuing informationally sensitive securities like equity, and should have lower debt (Rajan and Zingales, 1995). Another argument on the relationship between leverage and firm size is based on bankruptcy costs. Bankruptcy costs are relatively smaller for larger firms than for smaller ones. Larger firms also tend to be more diversified than smaller ones and are thus less prone to collapse (Titman and Wessels, 1988). This implies that as a firm grows its bankruptcy costs will fall and the likelihood that it will collapse also falls hence it is more likely to acquire more debt. We can measure firm size using the natural log of its sales or its total assets. The number of employees can also be used to measure firm size.

Asset tangibility - An important firm characteristic that has been empirically and theoretically found to determine leverage is asset tangibility (measured as the ratio of fixed assets to total assets). An increase in fixed assets increases tangibility. This also increases the value of collateral that such firms can pledge to get loans. Thus, tangibility and leverage are positively correlated. However, in bank-oriented countries tangibility may matter less since firm-bank relationships may be used by firms, and accepted by banks, in place of collateral (Booth *et al.*, 2001).

Growth opportunities - "Growth opportunities" is another firm attribute that may either increase or reduce its access to loans. A firm with more valuable future investment

⁵⁹ Titman and Wessels (1988) and Rajan and Zingales (1995) found a negative relationship between leverage and profitability.

opportunities has more intangible assets. Such intangible assets may be adversely affected by financial distress, so firms with high growth opportunities would borrow less today. This is especially so when one considers the fact that firms with valuable future investment opportunities value financial flexibility. Debt is usually given with a number of covenants that are designed to protect the interests of debtholders. Such covenants may be so restrictive as to make firms pass up positive net present value projects (Myers, 1977). So firms with more growth opportunities would have less leverage.

Reputation - Firms that have been there for a long time have established reputation and can easily access loans as compared to those that are just starting. Reputation, as measured by the number of years since the establishment of the firm, is thus positively related to debt. Table 3.4 below summarizes the explanatory variables that are used in the study.

Table 3.4: Explanatory Variables and their Proxies (Conventional Variables)

Explanatory Variable	Proxy for the explanatory variable
Profitability	Ratio of operating income to total assets
Market to book ratio	Market value of equity divided by net worth
Risk	Variance of return on assets
Return on assets	Net income divided by total assets or EBIT divided by total assets ⁶⁰
Corporate tax	Average corporate tax rate
Information availability	0, 1 for firms that pay dividend (Ojah and Manrique, 2005).
Size	Log of sales (Green and Mutenheri, 2002), book value of total assets (Johnson, 1997), number of employees.
Reputation	Age as measured by the number of years since the incorporation of the firm (Ojah and Manrique, 2005; Johnson, 1997).
Asset tangibility (collateral)	Total assets minus current assets divided by total assets (Booth <i>et al.</i> , 2001; Johnson, 1997; Rajan and Zingales, 1995).
Growth opportunities	Research and development or investment over sales or assets.

⁶⁰ EBIT=Earning before interest and tax.

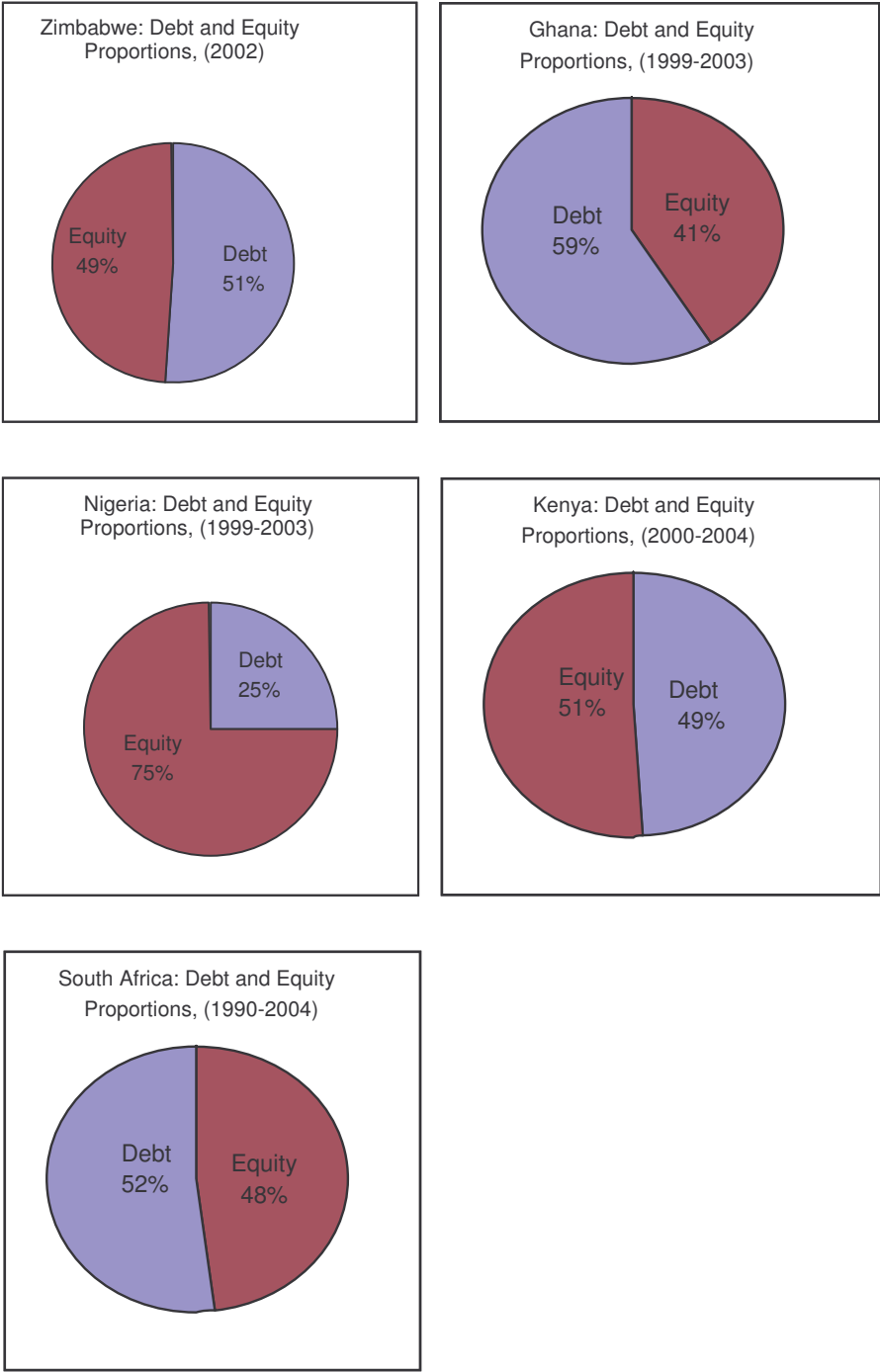
3.10 Estimation and Results on Debt/Equity Divide

3.10.1 Characteristics of Listed Firms in African Countries

The listed firms in Africa have certain common characteristics. They are usually big (in terms of number of employees, turnover or asset values), more productive, and are likely to be more transparently managed than the unlisted firms. They also have more options for raising capital than the unlisted firms and are normally scrutinized by investors who expect the maximization of their shareholdings. This section provides an overview of the data used for the analysis as well as the general characteristics of the sample firms. In the finance literature, the firm's characteristics are a major determinant of its financing decisions (capital structure).

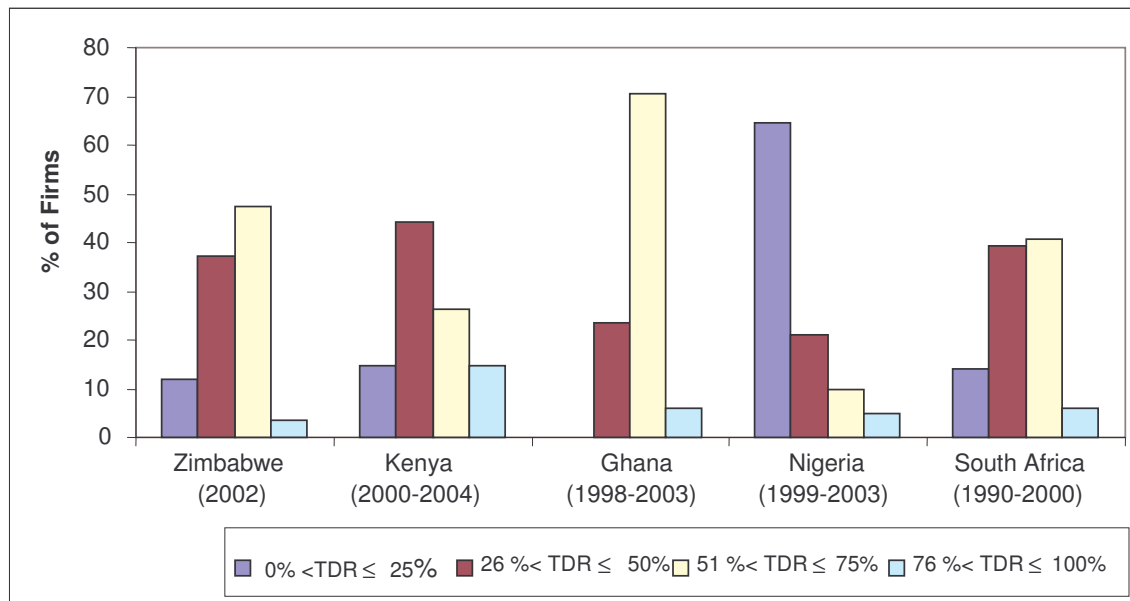
We start by looking at how the assets that the firms have were financed before delving into the characteristics of the firms proper. As can be seen in Figure 3.1 most firms' assets are generally financed by a great deal of equity as compared to debt. For example, Zimbabwean firms' average debt ratio is 50.7% implying that about 49.3% is equity while for Ghana, Nigeria, Kenya and South Africa the debt ratios are 59%, 25%, 49% and 52%, respectively.

Figure 3.1: The Debt-Equity Mixture in Africa



Source: Author's calculations

Figure 3.2: Percentage of listed firms using different levels of leverage, by country⁶¹



Source: Author's calculations

We divided the firms into quartiles and found that about 50% of the listed firms in Zimbabwe had total debt ratios between 50% and 75% while in Kenya the majority of the firms had their debt ratios between 25% and 50% (see Figure 3.2). In Ghana about 70% of the firms had debt ratios in the 50%-75% range while in South Africa 41% of the firms had their debt ratios in the 50%-75% range. The data evidently shows that most of the firms prefer to have leverage that is less than 75%. For example, in Zimbabwe only 3% of the firms had total debt ratios above 75% while 15%, 6%, 5% and 6% of the firms in Kenya, Ghana, Nigeria and South Africa, respectively had debt ratios that were above 75%. Generally, it seems most firms had debt ratios in the range of 25% to 75% with, Zimbabwe, Kenya, Ghana and South Africa respectively having 85%, 71%, 94% and 80% of their firms having debt ratios between 25% and 75%.

Figure 3.2 shows that Kenya had the largest number of highly leveraged firms. About 15% of its firms had total debt ratios that were above 75%, followed by Ghana and South Africa which had 6% each in that range. Nigeria and Zimbabwe had 5% and 3% of their firms, respectively in that range. The percentages of firms that had leverage ratios that

⁶¹ Leverage in this case is measured by total debt.

were less than 50% are 49%, 59%, 24%, 86% and 53% for Zimbabwe, Kenya, Ghana, Nigeria and South Africa, respectively.

While knowing the extent to which different firms in the different countries are levered is important, it is equally important to know the constituents of that debt; that is, whether the debt is short-term or long-term as well as its source (Is the debt bank debt or non-bank debt and if it is non-bank debt is it from the parent company or from suppliers as trade credit. If it is bank debt is it from private banks or public banks?⁶²). Unfortunately because of the nature of our data it is impossible to pinpoint the sources of debt as the abridged annual reports from which the data is accessed just give us the loans without telling us the sources of the loans. We were however able to get information on the maturity structure of debt. Data shows that most firms tend to use a significant amount of short-term debt as compared to long-term debt.

As documented in the background section of the study there are a number of reasons why firms in African economies tend to have low levels of long-term debt. Bond markets, which are a major source of long-term debt in most developed economies, are still in their infancy in terms of development and are basically dominated by government issues in most African economies. This forces firms to largely depend on banks as a source of external debt. Banks may deliberately offer the firms short-term debt, using it as a means of effective monitoring and disciplining those that may default. Just as political and macroeconomic instability (including high inflation levels and exchange rate volatility) encourage most firms located in African economies to concentrate on extractive and merchandising industries, such an environment can also create a situation where short-term debt is the only debt relatively accessible to firms. Property rights in most developing economies are not respected and contracts are not efficiently enforced. Lenders, taking all this into account, tend to offer less debt and whatever is availed is predominantly short-term. This may explain why firms in countries like Zimbabwe tend to use more trade credit than those in developed economies. In such an environment lenders may actually request collateral that may be twice the value of the loan from

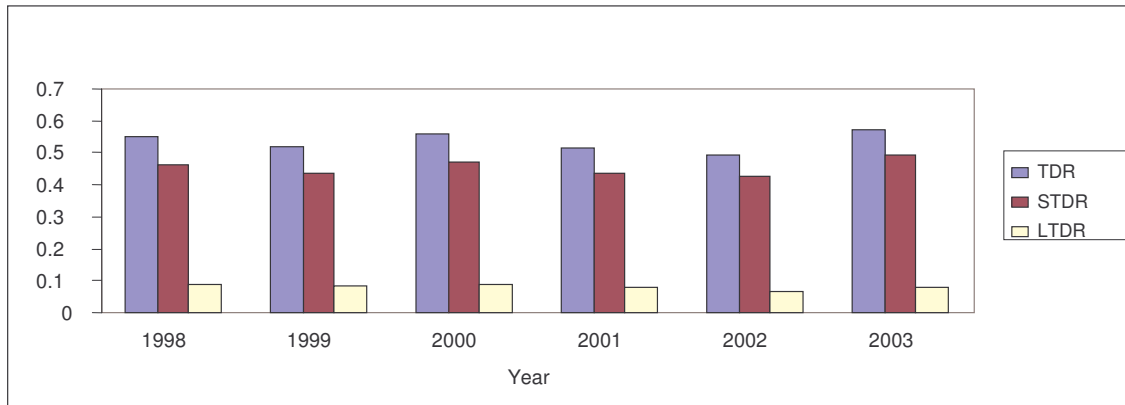
⁶² It is possible that some firms may be beneficiaries of directed lending policy by the government.

borrowers (see Kaniki, 2007). In Kenya, for example, banks request collateral that is usually about twice the value of the loans.

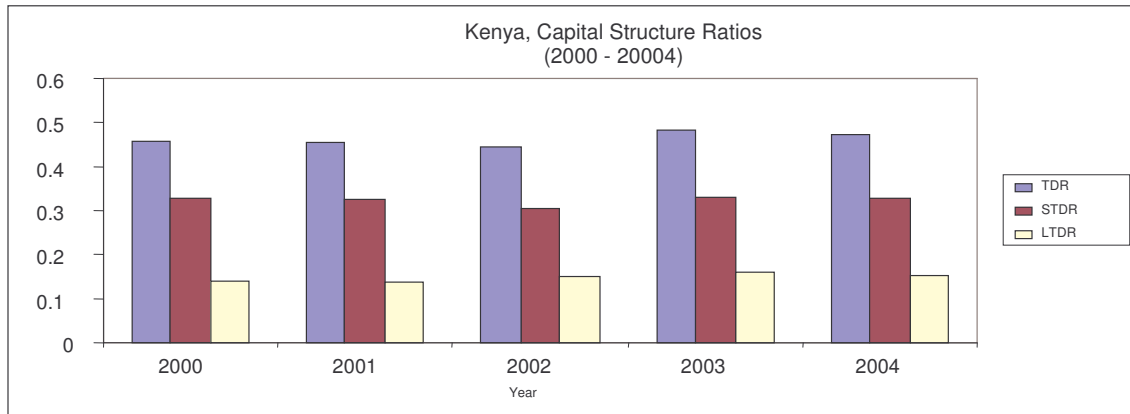
That debt in most African firms' capital structure is predominantly short-term debt can be seen from Figure 3.3, which shows the evolution of the different measures of leverage over time. It can be seen that the total debt ratio is generally constant over the years. With the exception of Nigeria, short-term debt accounts for more than 75% of the total debt in all the countries (see Figure 3.3).

Figure 3.3: Evolution of capital structure ratios in the sample countries

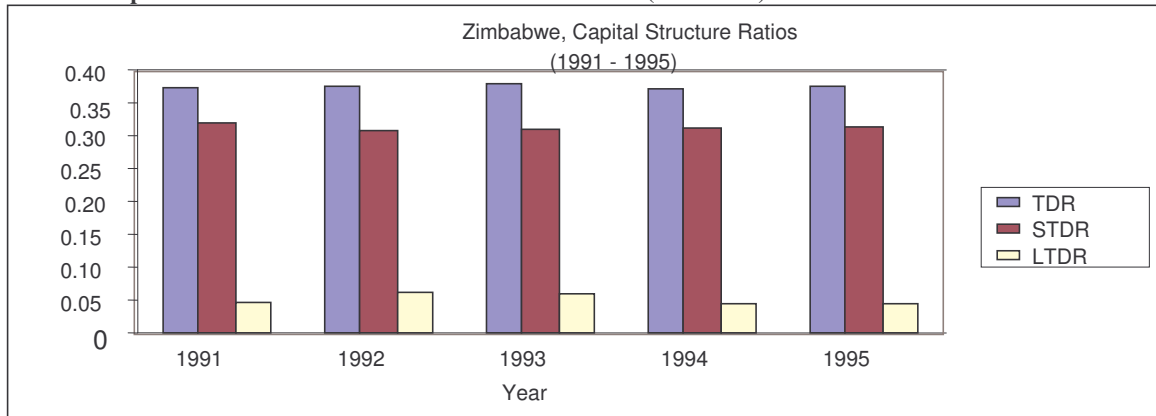
Panel A: Capital structure ratios for Ghanaian listed firms (1998-2003)



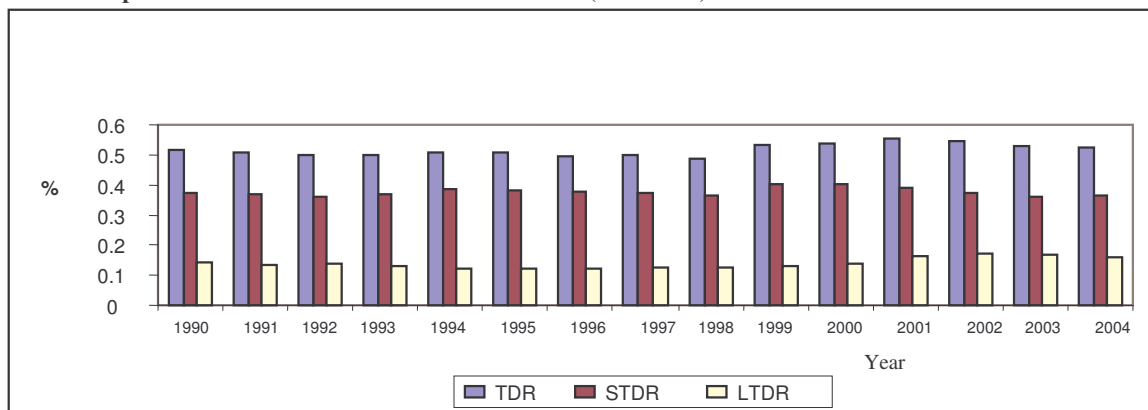
Panel B: Capital structure ratios for Kenyan listed firms (2000-2004)



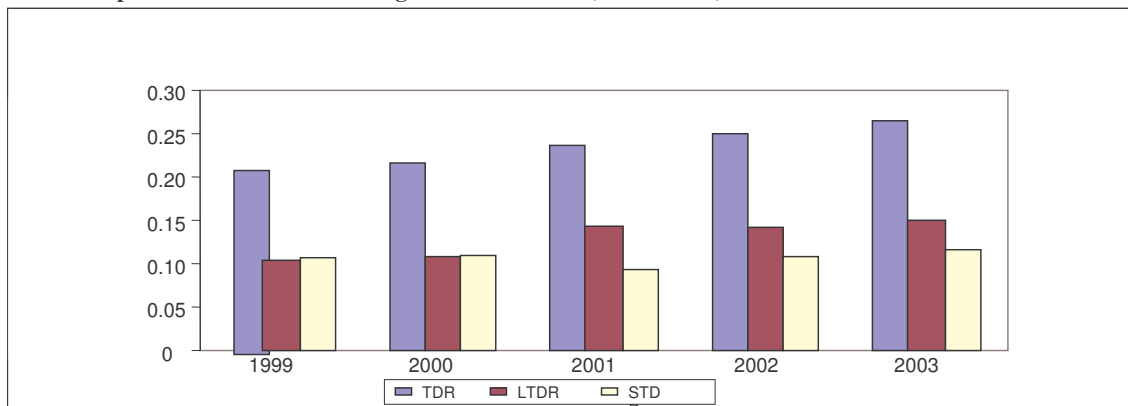
Panel C: Capital structure ratios for Zimbabwean listed firms (1991-1995)



Panel D: Capital structure ratios for South African firms (1990-2004)



Panel E: Capital structure ratios for Nigerian listed firms (1999 – 2003)



TDR stands for total debt ratio, computed as total debt divided by total assets. STDR stands for short term debt ratio, computed as short term debt divided by total assets. LTDR for long term debt ratio, computed as long term debt divided by total assets.

Source: Author's calculations

In order to learn more from the data concerning the use of debt we divided the firms from each country into four groups: i.e., firms with TDRs less than 25%, those with TDRs between 25% and 50%, those with TDRs between 50% and 75% and those with TDRs more than 75%. We repeated this for short-term and long-term debt ratios as well. The results are shown in Figure 3.4, Figure 3.5 and Figure 3.6. Figure 3.4 shows that 54%

of the firms in Zimbabwe had short-term ratios between 25% and 50% while 34% had short-term ratios that were less than 25%. This means about 84% of the firms in Zimbabwe had short-term debt ratios that were less than 50%. In Kenya 44% of the firms had short-term debt ratios that were less than 25% while 32% used short-term debt ratios between 25% and 50% implying that about 75% of the firms had short-term debt ratios that were less than or equal to 50%. About 71% of the firms in Ghana had short-term debt ratios between 25% and 50% while 24% of the firms had short-term ratios that were less than 25%. This means that about 95% of the firms in Ghana had short-term ratios that were less than 50%. In South Africa, 83% of the firms had short-term ratios that were less than 50%. This implies that generally the firms in these African countries tend to prefer short-term debt that is less than 50%. This is despite the fact that most firms have access to bank overdrafts that they tend to roll over.

Figure 3.4: Percentage of firms using short term debt by country

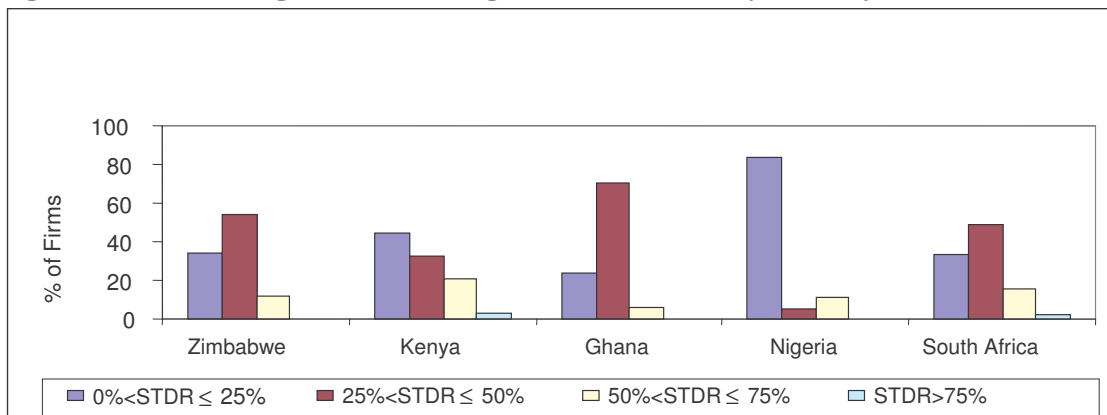


Figure 3.5: Percentage of firms using long-term debt by country

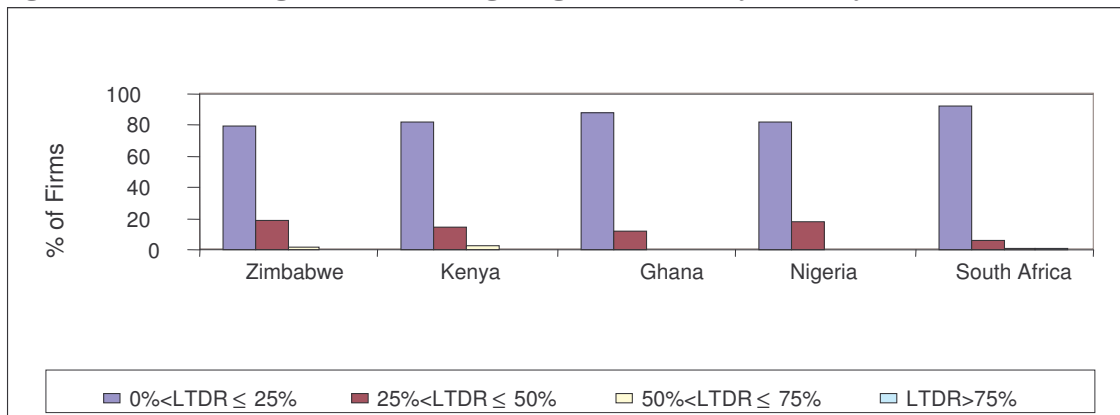
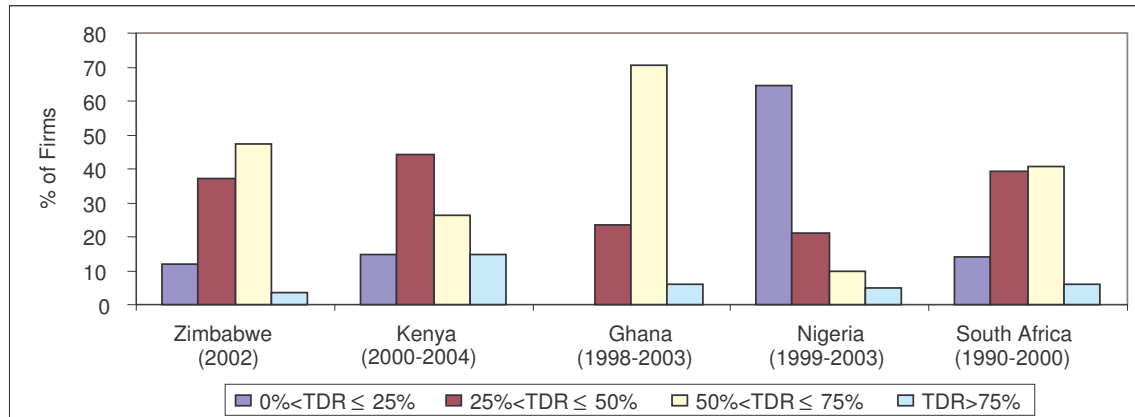


Figure 3.6: Percentage of firms using total debt by country



Note: TDR stands for total debt ratio, computed as total debt divided by total assets. STDR stands for short term debt ratio, computed as short term debt divided by total assets. LTDR for long term debt ratio, computed as long term debt divided by total assets.

Source: Author's calculations

A further look at long-term debt usage further confirms our *a priori* expectation that long-term debt is not used by many African firms and those that use it do so minimally. Table 3.5 shows that for all the countries looked at, more than 80% of the firms that had long-term debt had long-term debt ratios that were less than 25%. In all the countries the percentage of firms with long-term debt ratios above 75% was equal to zero. This confirms the effect of the unstable macroeconomic environment constraints against long-term production decisions, including financial contracts.

Table 3.5: Percentage of firms using different levels of long term debt, by country

	Zimbabwe	Kenya	Ghana	Nigeria	South Africa
0% < LTDR ≤ 25	80	82	88	82	93
25% < LTDR ≤ 50	19	15	12	18	6
50% < LTDR ≤ 75	1	3	0	0	1
LTDR > 75	0	0	0	0	0
Total	100	100	100	100	100

Source: Author's calculations

In an attempt to address the issue of the applicability of capital structure theories to developing economies, we assess whether the debt ratios in our sample countries are comparable to those found in other countries. Table 3.6 includes the total debt and long-term debt ratios for the five countries in our sample as well as those for the developed economies like the US, Japan, Germany, France, Italy, UK and Canada from Rajan and Zingales (1995). Developing countries' data from Booth *et al.* (2002) include Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and

Zimbabwe. When it comes to leverage as measured by total debt ratios there is no significant difference between our sample countries and other developing economies. In comparison to developed economies the leverage levels in the sample economies are generally lower. The long-term ratios in African economies are significantly lower than those in the developed economies as well, but are similar to quite a few of the developing economies such as Brazil, Mexico, Jordan and Turkey.

Table 3.6: Debt Ratios

Country	Number of Firms	Time Period	Total Debt Ratio	Long-term Book-debt Ratio
South Africa	137	1990-2004	52.0	14.0
Kenya	34	2000-2004	48.8	15.4
Zimbabwe	59	2002	50.7	17.2
Ghana	17	1998-2003	59.4	10.0
Nigeria	62	1999-2003	24.5	12.9
US	2580	1991	58.0	37.0
Japan	514	1991	69.0	53.0
Germany	191	1991	73.0	38.0
France	225	1991	71.0	48.0
Italy	118	1991	70.0	47.0
UK	608	1991	54.0	28.0
Canada	318	1991	56.0	39.0
Brazil	49	1985-1991	30.3	9.7
Mexico	99	1984-1990	34.7	13.8
India	99	1980-1990	67.1	34.0
South Korea	93	1980-1990	73.4	49.4
Jordan	38	1983-1990	47.0	11.5
Malaysia	96	1983-1990	41.8	13.1
Pakistan	96	1980-1987	65.6	26.0
Thailand	64	1983-1990	49.4	N/A
Turkey	45	1983-1990	59.1	24.2
Zimbabwe	48	1985-1987	40.3	11.1

Note that N/A means information is not available. Total debt ratio is defined as total debt (short-term debt plus long-term debt) divided by total debt plus book value of equity. Long term debt ratio is long-term debt divided by total debt plus equity (book value). The data for South Africa, Kenya, Zimbabwe, Ghana and Nigeria, in the first five rows were collected by the author from the annual reports of the firms as stated in the stock exchange handbooks of the different countries. Data for US, Japan, Germany, France, Italy, UK and Canada are from Rajan and Zingales (1995). Data for Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe, in the last set of rows, are from Booth *et al.* (2001).

Source: Adopted from Booth *et al.* (2001), Rajan and Zingales (1995) and Author's own calculations.

Having looked at the composition of capital raised, i.e. in terms of how much is debt and how much is equity, we now look at the characteristics of the firms. The firm characteristics are important in this particular study because they are important factors in the determination of the firms' capital structures. The firm characteristics (variables) that we look at include age, asset tangibility, profitability, size, corporate tax and risk.

3.10.2 Summary of variables by country

Table 3.7 provides a summary of the descriptive statistics of both the dependent and the independent variables. The average total debt ratios for Kenya, Ghana, Zimbabwe, South Africa and Nigeria were 49%, 59%, 38%, 52% and 23%, respectively. We disaggregated the total debt into short-term debt and long-term debt found that short-term debt as a percentage of total funds used in financing the assets of the firms in the sample countries was as follows: 34%, 49%, 12%, 38% and 32% for Kenya, Ghana, Nigeria, South Africa and Zimbabwe, respectively. In separate calculations not shown in the table we find that short-term debt as a percentage of total debt is as follows; 67%, 83%, 48%, 71% and 84% for Kenya, Ghana, Nigeria, South Africa and Zimbabwe respectively. This confirms that short-term debt dominates long-term debt. Long-term debt in the five countries accounts for a small proportion of the total funds used to finance the total assets that the firms had. For example Kenya's long-term debt accounts for only 15% of the total amount used in financing assets while in Ghana, Nigeria, South Africa and Zimbabwe it accounts for 9%, 13%, 14% and 6%, respectively.

As explained in the literature review and methodology sections, age plays an important role in firms' capital structure determination. Especially if we consider the fact that older firms are more likely to easily access loans than firms that are just starting. The average age of the sample firms is 43 years with some having a minimum age of 0, i.e. some were less than one year old while some firms, like those in South Africa and Zimbabwe, were 144 years or older than that. The variation in age is highest in Zimbabwe and lowest in Nigeria. The mean return on assets in the sample firms is about 12%. It is highest in South Africa and lowest in Kenya. Its variation is highest in Nigeria. The mean tax rate for all the countries considered is around 30% for most of the firms in the sample. It is highest in Kenya and lowest in Zimbabwe. Its variation is highest in Kenya.

Table 3.7: Descriptive Statistics by country

Variable	Statistic	Country				
		Kenya (2000-2004)	Ghana (1998-2004)	Nigeria (1999-2003)	South Africa (1990-2004)	Zimbabwe (1991-1995)
Size	Mean	6.30	8.09	6.18	5.58	5.31
	Std. Dev.	0.73	0.86	0.77	0.91	0.43
	Min	4.72	6.64	4.52	3.54	4.28
	Max	7.44	10.01	7.44	7.46	6.27
Age	Mean	54.24	38.5	35.6	45.08	44.33
	Std. Dev.	21.33	21.66	14.16	29.85	27.63
	Min	5.00	8.50	4.00	0.00	0.00
	Max	94.00	104.5	76.00	112	144.00
Roa	Mean	0.08	0.12	0.11	0.14	0.116
	Std. Dev.	0.07	0.08	0.39	0.10	0.06
	Min	-0.10	-0.01	-0.89	-0.11	-0.03
	Max	0.21	0.29	1.81	0.50	0.28
Asst	Mean	0.55	0.37	0.94	0.32	0.54
	Std. Dev.	0.18	0.21	0.78	0.24	0.00
	Min	0.10	0.03	-0.01	0.00	0.17
	Max	0.84	0.08	5.02	0.87	0.84
Tax	Mean	0.36	0.24	0.30	0.27	0.267
	Std. Dev.	0.55	0.11	0.47	0.23	0.08
	Min	-0.37	0.01	-0.11	-1.09	0.01
	Max	3.08	0.39	2.68	0.66	0.48
Risk	Mean	na.	0.07	0.28	0.10	0.05
	Std. Dev.	na.	0.04	0.4	0.23	0.03
	Min	na.	0.00	0.00	0.02	0.01
	Max	na.	0.18	1.73	2.25	0.48
Ltdr	Mean	0.15	0.09	0.13	0.14	0.06
	Std. Dev.	0.14	0.17	0.13	0.16	0.08
	Min	0.00	0.00	0.07	0.00	0.00
	Max	0.63	0.72	0.49	0.92	0.40
Stdr	Mean	0.34	0.49	0.12	0.38	0.32
	Std. Dev.	0.22	0.21	0.22	0.19	0.13
	Min	0.04	0.13	0.00	0.03	0.09
	Max	0.75	0.89	0.73	0.81	0.59
Tdr	Mean	0.49	0.59	0.25	0.52	0.38
	Std. Dev.	0.23	0.18	0.23	0.22	0.13
	Min	0.15	0.35	0.07	0.03	0.14
	Max	1.00	0.93	0.89	0.99	0.61

Source: Author's calculations from data collected from various stock exchange handbooks.

Note: Roa stands for return on assets, Asst stands for asset tangibility, Ltdr stands for long-term debt ratio, Stdr stands for short-term debt ratio and Tdr stands for total debt ratio.

In order to assess the extent to which these variables are correlated we constructed correlation matrices of the variables for each country. Our results are shown in Table 3.8. As expected, the short-term debt and total debt are highly correlated in all the matrices. This is because an increase in short-term debt (the dominant form of debt among SSA firms) will obviously increase total debt as well. But because total debt is made up of short-term debt and long-term debt, an increase in one may be because of a fall in the other hence long-term debt and short-term debt are negatively related for all countries. In all the countries the correlations between asset tangibility and total debt, and size and

total debt are negative. The latter result lends credence to the notion that larger firms have access to more sources of funds - higher internal and external equity – than smaller firms, and thus prefer not to use the costly external debt. The relationship between tangibility and total debt may be a reflection of short-term dominance of sample firms' total debt – it is long-term debt that usually requires physical assets as collateral. The correlation between profitability and total debt is negative for firms in Zimbabwe, Kenya, Ghana and South Africa and it is positive for the firms in Nigeria. The four countries' results suggest that firms in Africa would borrow less to fund their activity if they had increased internal finance.

Table 3.8: Correlation matrices for variables used

Panel A: Correlation matrix for Zimbabwe variables (2000)

	Tdr	Stdr	Ltdr	Age	Ast	Roa	Size	Tax
Tdr	1.00							
Stdr	0.75***	1.00						
Ltdr	0.45***	-0.24*	1.00					
Age	0.07	-0.18	0.36***	1.00				
Ast	-0.41***	-0.55***	0.09	0.003	1.00			
Roa	-0.18	0.01	-0.29**	-0.01	-0.24*	1.00		
Size	0.23*	0.22*	0.05	0.02	-0.11	0.11	1.00	
Tax	-0.24*	-0.16	-0.14	-0.04	-0.20	0.29**	0.10	1.00

Panel B: Correlation matrix for Nigeria variables (1999 - 2003)

	Tdr	Stdr	Ltdr	Age	Ast	Roa	Size	Tax	Risk
Tdr	1.00								
Stdr	0.83***	1.00							
Ltdr	0.41***	-0.15	1.00						
Age	-0.23*	-0.22*	-0.55	1.00					
Ast	-0.04	-0.23*	0.32	0.20	1.00				
Roa	0.20	0.12	0.14	0.0004	0.05	1.00			
Size	0.07	-0.01	0.15	0.23*	0.20	0.34***	1.00		
Tax	0.11	-0.04	0.29**	0.11	0.04	0.01	0.20	1.00	
Risk	0.02	0.01	0.03	0.15	0.47***	-0.28**	-0.08	-0.11	1.00

Panel C: Correlation matrix for Kenya variables (1991- 2004)

	Tdr	Stdr	Ltdr	Age	Ast	Roa	Size	Tax	Risk
Tdr	1.00								
Stdr	0.74***	1.00							
Ltdr	0.46*	-0.24	1.00						
Age	0.45*	-0.17	0.43**	1.00					
Ast	-0.37*	-0.67***	0.39**	0.27	1.00				
Roa	-0.31	-0.08	-0.33	-0.36*	-0.37*	1.00			
Size	0.44*	0.35*	0.17*	0.14	-0.02	-0.31	1.00		
Tax	-0.32	0.21	-0.75	-0.10	-0.26	0.27	-0.06	1.00	
Risk	0.21	-0.22	0.61	0.30	0.11	0.24	-0.13	-0.45**	1.00

Panel D: Correlation matrix for Ghana variables (1998- 2003)

	Tdr	Stdr	Ltdr	Age	Ast	Roa	Size	Tax	Risk
Tdr	1.00								
Stdr	0.68***	1.00							
Ltdr	0.28	-0.50**	1.00						
Age	0.01	0.09	-0.11	1.00					
Ast	-0.33	-0.72***	0.56**	-0.05	1.00				
Roa	-0.11	0.09	-0.26	0.34	-0.26	1.00			
Size	0.20	-0.42*	0.80***	-0.16	0.61***	-0.07	1.00		
Tax	-0.42*	-0.10	-0.36	0.34	-0.14	0.36	-0.40	1.00	
Risk	0.17	0.41*	-0.33	0.03	-0.28	0.42*	-0.34	0.30	1.00

Panel E: Correlation matrix for South Africa variables (1990 - 2004)

	Tdr	Stdr	Ltdr	Age	Ast	Roa	Size	Tax	Risk
Tdr	1.00								
Stdr	0.73***	1.00							
Ltdr	0.28***	-0.45***	1.00						
Age	-0.17	-0.04	-0.16	1.00					
Ast	-0.03	-0.34***	0.44***	0.02	1.00				
Roa	-0.07	-0.05	-0.02	-0.13	-0.14	1.00			
Size	0.12	0.17	-0.09	0.19*	-0.18*	0.30***	1.00		
Tax	0.14	0.17	-0.05	-0.004	-0.12	0.01	0.19*	1.00	
Risk	-0.04	-0.10	0.08	-0.2	-0.08	0.88***	0.01	-0.02	1.00

Ast stands for asset tangibility, tax for tax rate, Roa for return on assets, Ltdr for long-term debt ratio, Stdr for short-term debt ratio and Tdr for total debt ratio.

Source: Author's own calculations

3.10.3 Data Issues

Of paramount importance is ascertaining that the data that we are using satisfies the general assumptions of the ordinary least squares regression model which we employ later in the analysis. An example is the normality assumption of the error term. Consequently, we examine a number of issues including the following: skewness of the data, presence of outliers and normality of residuals.

As can be seen from the graphs in Appendix A3.1, the variables are reasonably normal and we can therefore analyze the data accepting the notion that the error terms are distributed normally. A graphic analysis can be used to assess whether or not the residuals are reasonably normally distributed. If the residuals are mostly around the diagonal line then the residuals are said to be reasonably normally distributed. In the graphs in Appendix A3.1, we graphically test for normality in each of the countries. As can be seen from the graphs the residuals are reasonably normal, as they tend to cling or hover around the straight line. A regression of total debt ratio on tax rate, asset tangibility, returns on assets, age, size and risk gives us residuals that are reasonably adjacent to the diagonal. The degree of normality of the residual errors of course differ between countries with the residuals from the South African and Zimbabwe data

performing remarkably well as compared to the rest of the countries in the sample. The residuals from the Ghana data are few due to the small sample size.

3.10.4 Estimation of the Debt/Equity Divide Models

In this section we report the findings from our regression analysis. The regression analysis was first conducted on a country by country basis using the cross section data. This was then followed by the panel data analysis again done on a country by country basis. To have a better understanding of the impact of country-specific factors, we also used a pooled panel regression. For cross-section analysis the variables were averaged over a given period to reduce noise.

Before looking at the results, let us first examine some important data issues. The first issue is that the data used was collected from balance sheets and income statements of firms listed on the different countries' stock exchanges. These statements are largely abridged and it is difficult to get all the variables in disaggregated forms. For example, we only managed to get debt levels for the firms but found it difficult to get some information concerning the sources of the debt, such as whether it is from banks or from non-bank sources or whether it is from government-owned banks or private banks. Such information is useful for a study like this one.

The other problem is that of small sample sizes. Recall that the number of firms listed on most African stock exchanges is generally low. The exclusion of all financial firms including banks, insurance firms, asset management firms, among others further reduced the sample size. The other contributing factor is that a number of firms also fall out of the sample when they are suspended or de-listed; thus increasing the attrition rate.

A combination of the above factors makes it difficult to conduct more detailed and probably more revealing analyses and tests such as those conducted by Bradley *et al.* (1984), for example. This leaves us with limited options as to what kind of analysis can be carried out using the data at our disposal. More often than not, the models used are of the eclectic types that tend to group variables from different theories and then look at the signs of the coefficients of the variables. If the sign of a given variable satisfies the

postulations of a given theory then this may imply that that theory holds. Our analyses largely follow the eclectic modeling approach.

3.10.5 Cross Section Regression Results on Kenya

The regression for Kenya was conducted as follows. We started by looking at all firms that were continuously in the sample from 1991 to 2004. We dropped all the financial firms and those firms that were de-listed during the sample period. We also dropped a number of firms for which we did not have the required information. As a result the sample sizes we finally used for the analyses are smaller than the number of listed firms on stock exchanges in the sample countries. We obtained a sample size of 26 non-financial firms. We estimated the cross section equations based on that sample size, and then in order to increase the sample size and thus the degrees of freedom we also looked at a shorter period from 2000 to 2004 and the sample size increased to 34. We also disaggregated the total debt into short-term debt and long-term debt and ran separate regressions of short-term, long-term and total debt ratios as dependent variables. The results for the different equations are as shown in Table 3.9.

Table 3.9: Cross Section regression results for Kenya (2000 – 2004 and 1991 to 2004)

Explanatory Variable	1991-2004			2000 – 2004		
	Total debt ratio	Short-term debt ratio	Long-term debt ratio	Total debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	-1.046 (-3.13)***	-0.321 (-1.34)	-0.724 (-2.19)**	-1.500 (-3.43)***	-0.898 (-2.38)***	-0.607 (-1.68)*
Tax rate	-0.706 (-4.58)***	-0.738 (-3.36)***	0.032 (0.18)	0.058 (0.1)	0.068 (1.26)	-0.062 (-1.4)
Age	0.0044 (2.34)**	0.0143 (3.11)***	-0.00002 (-0.01)	0.001 (0.67)	0.001 (0.71)	0.00009 (-0.08)
Risk	1.482 (2.33)**	-1.25 (-0.226)	2.058 (2.84)**	1.078 (0.85)	0.354 (0.34)	0.744 (0.93)
Size	0.076 (2.47)**	0.407 (1.34)	0.035 (1.67)*	0.096 (2.01)*	0.07 (1.45)	0.027 (0.8)
Assettangibility	-0.713 (-4.70)***	-0.844 (-6.50)***	0.13 (1.10)	-0.427 (-2.62)**	-0.621 (-4.39)***	0.198 (1.39)
Constant	0.295 (1.05)	0.857 (2.53)**	-0.292 (-1.12)	0.099 (0.30)	0.188 (0.55)	-0.093 (-0.51)
Sample size ⁶³	26	26	26	34	34	34
F(6,27)				3.99	4.44	2.38
F(6,19)	20.91	16.24	16.15			
Prob>F	0.000	0.000	0.001	0.005	0.003	0.05
Adjusted R-squared	0.71	0.78	0.55	0.42	0.38	0.29

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1%, respectively.

Generally the results from the Kenyan data seem to confirm a number of theoretical postulations. On the relationship between profitability and leverage we found that there is an inverse relationship between profitability and all the measures of leverage used in the analysis. This confirms hypothesis 1 which states that there is an inverse relationship between profitability and leverage. The robustness of the profitability coefficient is still maintained even when one uses a different time period. It is however more significant when one uses total debt as compared to its constituencies. For example the coefficient for profitability is -1.5 in the total debt equation for the period 2000-2004. This means the coefficient of the profitability variable in the total debt model is 2.5 times greater than the

⁶³ The sample size for the period 1991-2004 is small because we dropped all financial firms. The attrition rate is also high because a number of firms did not have the required information for the 1991-2004 period hence they were dropped out of the sample.

coefficient of the profitability in the long-term debt equation for the period 2000–2004. This result confirms the pecking order postulation that more profitable firms use or prefer less debt as compared to less profitable ones. There are a number of reasons why firms may prefer internal funds. These include that firms may need to maintain financial flexibility. They may also want to minimize the amount of information that goes to outsiders. Firms may also prefer internal funds because it reduces monitoring by the market (Shuetrim *et al.*, 1993). Firms may also prefer internal funds if the debt markets are not forthcoming with alternative funds.

Asset tangibility is inversely related to total debt as well as to short-term debt but positively related to long-term debt. The results are robust to changes in the sample period. Even though the asset tangibility coefficients in the long-term debt model are marginally significant their positive signs seem to confirm our earlier observation that tangible assets serve as collateral mainly for accessing long-term credits and not for accessing short-term credits.

Size seems to matter when it comes to raising capital in Kenya. The size coefficient is positively related to all the measures of leverage used in the analysis. This confirms hypothesis 4 which states that size and leverage are positively related. The size coefficient is significantly different from zero in the total debt equation in both time periods that we examined as well as in the long-term debt models for the period 1991–2004.

On the relationship between taxation and leverage we find that when using the 1991–2004 sample, the tax variable is inversely related to total debt and short-term debt. The tax coefficient is significant at 1% level of significance. For the same period the long-term debt ratio is found to be positively related to the tax variable even though it is not significant even at the 10% level of significance. The 2000–2004 sample did not produce significant results for this variable. For this particular period, the tax rate is found to be positively related to both short-term and total debts but inversely related to long-term debt.

Firms that have stayed in the industry for a long period tend to borrow more as compared to those just starting. This is so because with time firms establish themselves and thus gradually build their reputational capital which they can use to access loans from banks or trade credit from suppliers. We therefore expected the age variable to be positively related to the different measures of leverage. The variable was positively related to total debt and short-term debt for the 1991-2004 period. The estimated coefficient of the age variable was significantly different from zero at 5% and 1% levels of significance for the total and short term debt ratios, respectively. This implies that age matters when it comes to financing choices for firms in Kenya.

On the relationship between risk and leverage we find that for the period 1991-2004 risk is positively related to both total debt and long-term debt. The coefficients are significant at 5% level. This is however an unexpected sign, as an increase in indebtedness increases the likelihood of financial distress and bankruptcy.

3.10.6 Cross Section Regression Results on Zimbabwe

Since the year 1998, Zimbabwe has been going through difficult times, economically and politically. We expected to see firms probably behaving differently in the post 1998 period as compared to the period before that. Table 3.10 shows the regression results for the averages in the period 1991-1995 and the year 2000 data. Profitability coefficients for the period 1991-1995 were negative and significantly different from zero. For the year 2000 the profitability coefficients were negative and significant in the total debt and long-term debt models. This means that more profitable firms tend to use less debt as compared to the less profitable ones, confirming the pecking order theory predictions.

The relationship between tax and leverage seems to confirm the trade-off theory of capital structure. From the results we see that the tax rate variable is positive and significantly different from zero for the 1991-1995 sample in the short-term debt equation. There is however a negative relationship between tax and long-term debt for the same period. This means the tax rate seems to play an important role in the determination of capital structure in Zimbabwe and that firms tend to consider the tax effects associated with borrowing. For the 2000 sample the tax rate is negatively related to all the measures

of leverage. The tax coefficient is significant in the total debt and short-term equation but not so in the long-term debt ratio. This sign reversal for 2000 data strongly suggests the diminished importance of tax shield of debt financing in Zimbabwe.

Table 3.10: Cross section regression results for Zimbabwe (1991 – 1995) and 2000

Explanatory Variable	1991 to 1995			2000		
	Total debt ratio	Short-term debt ratio	Long-term debt ratio	Total debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	-0.875 (-2.58)**	-0.4544 (-1.68)*	-0.421 (-1.69)*	-0.19 (-1.66)*	0.142 (0.5)	-0.1422 (-2.99)***
Tax rate	0.091 (0.36)	0.267 (5.4)***	-0.177 (-2.22)**	-1.227 (-2.61)**	-1.0912 (-2.82)***	-0.136 (-0.41)
Age	0.006 (0.83)	0.0001 (0.29)	0.0004 (0.88)	0.00031 (0.44)	0.001 (1.91)*	0.0015 (1.83)*
Risk ⁶⁴	-0.865 (-1.4)	-1.222 (-2.63)**	0.356 (0.78)			
Size	0.0597 (1.2)	0.0954 (2.66)**	-0.0356 (-0.98)	0.0912 (2.12)**	0.07 (1.7)*	0.021 (0.77)
Assettangibility	-0.606 (-4.14)***	-0.606 (-4.14)***	0.142 (1.32)	-0.395 (-4.01)***	-0.409 (-5.12)***	0.014 (0.23)
Constant	0.514 (2.09)**	0.311 (1.52)	0.202 (1.12)	0.143 (0.46)	0.142 (0.54)	0.001 (0.01)
F(6, 30)	3.39	6.96	1.66			
F(5, 51)				7.34	7.63	2.40
Prob>F	0.011	0.0001	0.165	0.000	0.000	0.05
Sample size	37	37	37	57	57	57
Adjusted R-squared	0.29	0.49	0.25	0.38	0.37	0.22

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

The age coefficient was found to be significant and positive in the short-term and long-term debt equations, implying that age does matter in explaining the way firms raise

⁶⁴ Given the way we have calculated the risk variable it is not possible to calculate it for a single year hence the risk coefficient is not estimated for the 2000 regressions. We calculated it as the standard deviation of return on assets for several years.

capital. Size is positively related to all the three measures of leverage with the exception of long-term debt for the 1991-1995 sample. It is however not significant for this equation. It seems that size matters to Zimbabwean firms when it comes to raising capital. This is not surprising since bigger firms tend to have a stronger asset base which they can use as collateral when accessing loans.

Asset tangibility is negatively related to total debt and short-term in both periods, implying that, by and large, asset tangibility is negatively related to leverage for Zimbabwean firms. A possible explanation on the negative relationship between asset tangibility and leverage may be that the variable may be a proxy for the non-debt tax shields, such as research and development and depreciation provisions. Non-debt tax shields and leverage are negatively related. Asset tangibility is however, positively related to long-term debt but the estimated parameters are insignificant. Risk and leverage are negatively related in the short-term debt and total debt models. The coefficient of risk is however only significant in the short-term debt model. The risk variable only entered the models that used the 1991-1995 sample because we could not calculate risk just for one year given the way we calculated it⁶⁵.

3.10.7 Cross Section Regression Results on Nigeria

According to Table 3.11, firm size and tax are found to be positively related to all the measures of leverage used. Profitability is found to be positively related to all the measures of leverage. This implies that more profitable firms tend to borrow more as compared to less profitable ones. This means that the pecking order theory may not be applicable to Nigerian firms. It is likely that most profit go towards dividend payments to equity holders who provide about 77% of firm's assets. Thus it is both beneficial and necessary to seek external funds via debt when recorded profits are largely given back to its numerous owners. So it is possible that Nigerian firms may be using profits to pay dividends and not to fund new investments.

Leverage and tax are found to be positively related, confirming the trade-off theory which states that firms borrow more the higher the tax. The tax coefficient is significantly

⁶⁵ Risk was calculated as the standard deviation of return on assets.

different from zero in the total debt and long-term debt equations, but insignificant in the short-term debt model.

Table 3.11: Cross section regression results for Nigeria (1999-2003)

Explanatory Variable	Total debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	0.14 (1.21)	0.11 (0.98)	0.03 (0.76)
Tax rate	0.0784 (2.14)**	0.002 (0.07)	0.077 (2.25)**
Age	-0.005 (-2.47)**	-0.003 (-2.35)**	-0.001 (-1.22)
Risk	0.127 (1.34)	0.143 (1.56)	-0.016 (-0.33)
Size	0.022 (0.490)	0.019 (0.46)	0.004 (0.16)
Assettangibility	-0.04 (-0.83)	-0.09 (-2.41)**	0.06 (2.45)**
Constant	0.22 (0.87)	0.40 (0.61)	0.079 (0.59)
F(6, 55)	2.25	1.69	2.57
Prob>F	0.05	0.16	0.03
Sample size	62	62	62
R-squared	0.15	0.16	0.22

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1%, respectively.

On the relationship between asset tangibility and leverage we find that asset tangibility is negatively related to both total debt and short-term debt (see Table 3.11). The asset tangibility coefficient in the total debt equation is however insignificant while that in the short-term debt equation is significant at the 5% level of significance. In the long-term debt equation the relationship between leverage and asset tangibility is positive and significant at 5% level of significance; implying that firms with higher fixed assets to total assets ratios tend to access more long-term debt as compared to those with lower asset tangibility levels. This confirms the observation that tangible assets serve as collateral mainly for accessing long-term credits. Size and risk are insignificant in all the

models and age is negatively related to total debt and short-term debt. The age coefficients are significant at the 5% level in both models.

3.10.8 Cross Section Regression Results on Ghana

Even though the Ghanaian sample of non-financial firms is small we, for completeness, report the results from Ghana (see Table 3.12). The profitability variable is found to be negatively related to the three measures of leverage used in the analysis. The profitability coefficient is however only significantly different from zero in the total debt model. The inverse relationship between profitability and leverage implies that more profitable firms tend to use the internal funds for investments rather paying out the profits as dividends. This confirms the pecking-order theory which states that firms tend to prefer internal funds to external funds. This seems to confirm the idea that in an environment where the degree of information asymmetry is high firms tend to rely heavily on internal funds. Tax is negatively related to total debt and short-term debt, but positively related to long-term debt. The tax rate coefficient is however insignificant in all the models.

Age and size are found to be positively related to all three measures of leverage used. This implies that older and bigger firms can more easily access loans from debt markets than younger and smaller ones can. The large and older firms have acquired the requisite reputation that is required to access more debt. The age coefficient is significant at 5% level in the total debt ratio. It is however not significantly different from zero in the short-term and long-term debt models. The size coefficient is positive and significant at the 1% level of significance in the total debt and long-term debt models but marginally so in the short-term debt model.

Asset tangibility is negatively related to total debt and short-term debt. The asset tangibility coefficients in these two equations are significant at the 1% level of significance. A possible explanation for the negative relationship between asset tangibility and leverage may be that the variable is a proxy for the non-debt tax shields, such as research and development and depreciation provisions. Non-debt tax shields and leverage are negatively related. A positive relationship is found between risk and leverage, as measured by total debt and short-term debt. Our findings on the relationship

between leverage and variables like size, asset tangibility, profitability and corporate taxation also confirm the findings by Abor and Biekpe (2005) who looked at listed firms in Ghana.

Table 3.12: Cross Section Regression Results for Ghana (1999 -2003)

Explanatory Variable	Total debt ratio	Short term debt ratio	Long term debt ratio
Profitability	-0.7183 (-2.40)**	-0.406 (-1.23)	-0.313 (-1.05)
Tax rate	-0.4214 (-1.28)	-0.426 (-1.29)	0.0043 (0.02)
Age	0.00286 (2.35)**	0.002 (1.12)	0.0007 (0.61)
Risk	1.8121 (3.13)***	1.643 (3.06)**	0.17 (0.48)
Size	0.043 (5.33)***	0.006 (0.91)	0.037 (6.55)***
Assettangibility	-0.7015 (-4.45)***	-0.719 (-4.83)***	0.017 (0.15)
Constant	0.747 (8.06)***	0.701 (7.62)***	0.046 (0.81)
F(6,15)	16.87	47.67	184.00
Prob>F	0.000	0.000	0.000
Sample size	22	22	22
Adjusted R-squared	0.55	0.54	0.52

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1%, respectively.

3.10.9 Cross Section Regression Results on South Africa

Table 3.13 shows the regression results from the South African data. On the relationship between profitability and leverage we find that there is a negative relationship. This relationship is robust to changes in the definition of leverage. The coefficients are all significantly different from zero. In the total debt and long-term debt models the coefficients are significant at the 1% level of significance while in the short-term model the coefficient is significant at 10% level. This implies that the pecking order theory is applicable to South African firms, just as it is applicable to most countries in our sample.

Tax and leverage are found to be positively related to each other in all the equations. The coefficient is significant in the total debt and long-term equations at 5% and 10% levels

of significance, respectively. This confirms the predictions of the trade-off theory. On the relationship between risk and leverage, the results show that there is a negative relationship between short-term debt and risk, suggesting that more risky firms tend to have less short-term debt as compared to less risky ones. Total debt is also negatively related to risk, but the coefficient is not significant. There is a positive relationship between size and leverage. The size coefficient is significant in the total debt and short-term models at 1% and 10%, respectively. This suggests that large firms tend to have access to more debt as compared to smaller firms.

Table 3.13: Cross Section Regression Results for South Africa (1990 – 2004)

Explanatory Variable	Total debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	-0.110 (-4.66)***	-0.431 (-1.69)*	-0.089 (-3.47)***
Tax rate	0.241 (2.43)**	0.183 (1.57)	0.152 (1.94)*
Age	-0.115 (-1.55)	-0.014 (-0.18)	-0.083 (-1.66)*
Risk	-0.050 (-0.62)	-0.070 (-1.93)*	0.037 (0.98)
Size	0.337 (2.76)***	0.242 (1.68)*	0.012 (0.14)
Assettangibility	-0.162 (-1.80)*	-0.248 (-2.74)***	0.169 (2.35)**
Constant	-0.239 (-1.15)	0.065 (0.30)	-0.119 (-0.82)
F(6, 84)	6.04	4.32	6.29
Prob>F	(0.000)	(0.001)	(0.000)
Sample size	91	91	91
Adjusted R-squared	0.27	0.21	0.33

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

Asset tangibility and leverage are found to be negatively related in the total debt and short-term debt equations. This relationship was however found to be positive in the long-term debt equation. This confirms our earlier observation that tangible assets serve as collateral mainly for accessing long-term credits. The asset tangibility coefficient is

positive and significant at 5% level in the long-term model. In the short-term and total debt models the asset tangibility coefficients are negative and significant at 1% and 10% levels, respectively.

There is an inverse relationship between age and long-term debt. The age coefficient is significant at the 10% level of significance. This suggests that older firms are using more internal funds to finance their investment activities.

3.10.10 Augmented Model (using Heterodox Variables)

The purpose of this section is to investigate the capital structure determinants using both conventional and heterodox variables. We also aim to assess whether listed and unlisted firms behave differently when it comes to raising capital for additional investment. In order to do this we first selected all firms that invested a year prior to the survey. Secondly, we categorized the additional investments made by the firms by source of funds. That is, whether the funds used were some form of debt or equity. In this case leverage is defined as total debt divided by the sum of debt and equity.

In order to better understand the behaviour of listed and unlisted firms when it comes to raising capital we conducted some mean difference tests on a number of variables. We found that the amount of investment by listed firms is significantly larger than that of unlisted firms. This finding is consistent across the sample countries. For example, the amount of additional investment by South Africa's listed firms is five times greater than that by their unlisted counterparties. In Kenya, listed firms' additional investment was more than three times that of its unlisted firms. In Nigeria, listed firms' average investment is about N51million as compared to about N38million by the unlisted firms.

In terms of leverage, listed firms in South Africa and Nigeria's mean leverage is higher than that of their respective unlisted firms. The difference is however only significant in South Africa. More listed firms tend to export as compared to unlisted firms. Listed firms are also significantly larger than the unlisted firms across the countries. When it comes to the asset bases for the two groups of firms, we also found that listed firms have higher asset tangibility ratios as compared to the unlisted firms. From the mean difference table

we conclude that listed firms are big and mostly older than unlisted firms, highly leveraged and they also tend to be exporters as compared to the unlisted firms.

Table 3.14: Mean Difference Test between listed and unlisted firms in different countries

Country	Variable	Listed	Unlisted	t-statistics	p-values
South Africa	Amount Invested	R33.85m	R6.29m	-13.67***	0.0002
	Leverage	0.54	0.44	-3.83***	0.0002
	Export status	0.70	0.57	-0.97***	0.0002
	Size	750.00	277.82	-14.88***	0.0000
	Age	33.90	23.89	-10.76***	0.0000
	Asset tangibility	0.46	0.44	-2.58**	0.0100
Nigeria	Amount Invested	N51.07m	N37.92m	-1.30	0.1957
	Leverage	0.273	0.23	-0.56	0.1209
	Export status	0.27	0.12	-4.23***	0.00002
	Size	908.97	211.69	-25.64***	0.0000
	Age	30.88	18.09	-14.90***	0.0000
	Asset tangibility	0.55	0.64	4.10***	0.0001
Kenya	Amount Invested	K71.11m	K19.95m	-10.95***	0.0001
	Leverage	0.40	0.57	3.56***	0.0060
	Export status	0.80	0.54	-8.57***	0.0001
	Size	283.23	136.13	-6.65***	0.0000
	Age	48.00	25.84	-19.56***	0.0000
	Asset tangibility	0.15	0.10	-4.11***	0.0000

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

Amount invested is in the individual country's currency where R, N and K stand for South African Rands, Nigerian Naira and Kenya Shillings, respectively. Leverage is the total debt used in additional investment over the total funds raised, export status is a dummy taking a value of 1 if the firm exports some of its products and zero otherwise, size is the number of employees, age is the number of years since the incorporation of the firm, asset tangibility is value of fixed assets over value of total assets.

The regression results (see Table 3.15), using both listed and unlisted firms, seem to confirm our earlier findings from the data using only listed firms. The conventional variables included are age, size, profitability and asset tangibility. Age is positively related to leverage using Nigerian and Ghanaian data. The parameter is however only significant in the case of Ghana at 5% level of significance. In the case of South Africa and Kenya the parameter is negative and insignificant. Size is positively related to leverage in the case of Nigeria and Ghana. The coefficient is significant using Nigeria data only. In the case of South Africa and Kenya the parameter is insignificant and negative. Profitability is insignificant in all countries except for Kenya firms where the profitability coefficient is negative and significant at 1% level of significance. Asset tangibility is positive and significant in the case of Ghana but is insignificant and negative in the other three countries.

Table 3.15: Cross Sectional Results based on the Investment Climate Surveys

Explanatory variable	South Africa	Nigeria	Kenya	Ghana ⁶⁶
Constant	0.625 (1.89)*	-0.228 (-0.72)	0.072 (0.20)	-0.957 (-1.91)*
Age	-0.49 (-0.50)	0.010 (0.22)	-0.015 (-0.18)	0.228 (2.09)**
Size	-0.087 (-1.07)	0.102 (2.28)**	-0.018 (-0.27)	0.127 (0.29)
Profitability	0.077 (1.05)	0.001 (0.06)	-0.072 (-3.13)***	0.026 (0.85)
Assettangibility	-0.093 (-0.51)	-0.090 (-0.70)	-0.547 (-1.37)	0.691 (2.26)**
Location	0.183 (2.17)**	-0.042 (-0.48)	-0.119 (-0.61)	0.037 (0.42)
Export	-0.025 (-0.26)	0.023 (0.31)	-0.083 (-0.58)	0.087 (0.57)
Education	-0.096 (-1.10)	0.110 (1.40)	0.200 (1.44)	
Listed	0.526 (5.03)***	-0.045 (-0.35)	-0.115 (-0.28)	
Ethnicity	-0.143 (-0.86)	-0.196 (-2.06)**	0.238 (1.40)	
Audit	0.115 (0.42)	0.144 (1.92)*	0.680 (4.530)***	
Number of observations	130	139	59	103
R-squared	0.10	0.20	0.19	0.15
F(k, n)	3.20	4.94	1.12	2.85
Prob>F	0.001	0.000	0.1898	0.013

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

The dependent variable is leverage. Leverage is the total debt used in additional investment over total funds raised for additional investments. Age is the number of years since the incorporation of the firm, size is the number of employees, profitability is the growth in sales, asset tangibility is value of fixed assets over value of total assets, location is a dummy taking a value of 1 if firm is located in the capital city or province and zero otherwise, export is a dummy taking a value of 1 if the firms exports, education is a dummy taking a value of 1 if the highest level of education of manager is at a least a university degree, listed is a dummy variable if a firm is listed on the country's stock exchange, ethnicity is a dummy taking a value of 1 if the majority shareholder of the firm is African, audit is a dummy variable taking a value of 1 if the firms is audited by external auditors.

We also explored the impact of heterodox variables on leverage. We found that location does not matter in all the other countries except in South Africa where the location parameter is positive and significant at 5% level of significance (see Table 3.15). In Nigeria and Kenya, firms being led by managers whose qualification is a university degree or better tend to be highly leveraged as compared to those being led by managers whose highest qualification is less than a university degree. The education parameters in Nigeria and Kenya are positive and marginally significant. Listed firms in South Africa are highly leveraged as compared to unlisted. The listed parameter is positive and

⁶⁶ We could not get data on education, listed, ethnicity and audit from the data on Ghana. Zimbabwe was dropped because the surveys conducted by the World Bank did not cover the country.

significant at 1% level of significance. Ethnicity does not seem to matter in South Africa and Kenya. The ethnicity coefficient is however positive and significant in Nigeria. Firms whose annual results are audited by external auditors are highly leveraged as compared to those whose results are not audited. The audit parameter is positive and significant in Nigeria and Kenya. In South Africa it is positive but insignificant. Whether a firm exports or not does not seem to matter when it comes to how it raises capital.

3.11 Panel Data Estimation Results

As stated in the methodology section, the use of panel data brings in a number of advantages that are not available when using cross section or time series alone. In most panel data analysis, the random effects model (REM) and the fixed effect model (FEM) are commonly used. The choice of one type over the other depends on the problem at hand as well as the assumptions made concerning the error term. The REM for example, assumes that the individual specific error component (also called the individual heterogeneity), u_i , is random. The FEM assumes or ignores the unit specific residual. If we believe that such unit specific attributes are not random, then we can use the FEM. Use of FEM however implies a number of problems which include; the FEM suffers from large loss of degrees of freedom and that the use of many dummy variables may worsen the problem of multicollinearity among the explanatory variables. Further, the FEM cannot estimate the effect of time-invariant variables (e.g., managerial risk aversion and other firm-specific variables). The REM however helps mitigate the problem of too many variables being estimated and also the loss of degrees of freedom. For our purposes we report the results estimated by using both the FEM and REM models. We also conduct the Hausman test to assess the suitability of each of the model in the different equations.

3.11.1 Panel Data Results on Ghana

Table 3.16 shows the results on Ghanaian firms. The table shows that profitability is negatively related to leverage. This result persists even when one changes the model used. The results are also robust to changes in the definition of leverage. In the majority of cases the coefficient is significantly different from zero at 1% level of significance, confirming the cross section results that the Ghanaian firms, just like most other African

firms and even other firms in developed economies, seem to follow the pecking order theory. Even though the size variable was found to be insignificant it had the correct sign in all models, implying that firms with a big asset base tend to have higher leverage levels as compared to those with lower asset bases. This means that the firms may be using collateral to access loans in the Ghanaian debt markets. The tax coefficients were insignificant in all cases but had the correct signs.

Surprisingly, the age variable was found to have a negative relationship with leverage when using the FEM. When using the REM, age is positively related to both total debt and short-term debt. Age is negatively related to long-term debt when using the REM. In cases where the asset tangibility variable is significant it is negatively related to leverage. The Hausman test tells us that the FEM model is the appropriate choice for the total debt regression equation. The relationship between size and leverage is negative and is only significant when using long-term debt as a measure of leverage in the FEM. The tax coefficients are all insignificant.

Table 3.16: Ghana Panel Data Regression Results (1998 – 2003)

Explanatory variable	Fixed Effects Model			Random Effects Model		
	Total Debt ratio	Short-term debt ratio	Long-term debt ratio	Total Debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	-0.49 (-4.12)***	-0.39 (-3.33)***	-0.10 (-1.48)	-0.50 (-4.40)***	-0.38 (-3.37)***	-0.11 (-1.65)*
Size	0.170 (0.36)	0.128 (0.27)	0.043 (0.16)	0.511 (1.10)	0.095 (0.21)	0.064 (0.24)
Tax	0.07 (0.88)	0.01 (0.08)	0.06 (1.40)	0.01 (0.10)	0.01 (0.08)	0.05 (1.23)
Asset tangibility	-0.40 (-3.37)***	-0.42 (-3.64)***	0.02 (0.37)	-0.46 (-5.72)***	-0.43 (-4.71)***	0.03 (0.53)
Age	-0.01 (-1.24)	-0.002 (-0.47)	-0.004 (-1.36)	0.001 (0.97)	0.003 (1.93)*	-0.003 (-1.89)*
Constant	1.02 (4.65)***	0.79 (3.64)***	0.18 (2.53)**	0.77 (12.63)***	0.59 (6.96)***	0.24 (1.88)*
F(6, 101)	5.11	4.25	1.16			
Prob > F	[0.000]	[0.001]	[0.33]			
Wald $\chi^2(5)$				55.49	39.92	8.37
Prob > χ^2				[0.000]	[0.000]	[0.212]
No. of observations	129	129	129	129	129	129

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

3.11.2 Panel Data Results on Kenya

The results from the Kenyan data are as shown in Table 3.17 below. In all cases, the profitability variable was insignificant and had a positive sign (with the exception of the long-term debt equation in the REM where the coefficient is negative), implying that more profitable firms will borrow more as compared to less profitable ones. Asset tangibility is negatively related to total debt and short-term debt when using the FEM. These results are robust to changes in the model used. In most cases, the asset tangibility coefficient is significant at the 1% level of significance. Long-term debt and total debt are positively related to age, implying that older firms tend to have higher debt levels as compared to younger ones. Age is however negatively related to short-term debt in both FEM and REM models. The Hausman test indicates that the FEM model is the appropriate for the total debt regression equation.

Table 3.17: Kenya Panel Data Regression Results (1991 – 2004)

Explanatory variable	Fixed Effects Model			Random Effects Model		
	Total Debt ratio	Short-term debt ratio	Long-term debt ratio	Total Debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	0.06 (0.93)	0.03 (0.57)	0.03 (0.72)	0.01 (0.18)	0.03 (0.63)	-0.01 (-0.32)
Size	-0.008 (-0.30)	0.03 (1.31)	-0.04 (-2.12)**	0.02 (1.06)	0.01 (0.44)	0.01 (0.36)
Tax	0.003 (0.42)	0.01 (1.39)	-0.005 (-1.11)	0.003 (0.47)	0.01 (1.20)	(-0.004) (-0.88)
Asset tangibility	-0.11 (-1.87)*	-0.36 (-7.78)***	0.26 (6.99)***	-0.19 (-3.44)***	-0.44 (-9.45)***	0.25 (6.85)***
Age	0.004 (1.90)*	-0.01 (-3.38)***	0.01 (7.23)***	0.004 (3.09)***	-0.00002 (-0.02)	0.01 (5.49)***
Constant	0.29 (2.44)**	0.67 (6.86)***	-0.38 (-4.94)	0.162 (1.41)	0.51 (5.26)***	-0.37 (-4.73)***
F(5, 329)	1.85	22.18	31.84			
Prob > F	[0.103]	[0.000]	[0.000]			
Wald χ^2 (5)				26.20	111.97	132.97
Prob > χ^2				[0.000]	[0.000]	[0.000]
No. of observations	360	360	360	360	360	360

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

3.11.3 Panel Data Results on Nigeria

From the Nigerian data we find that profitability, where the coefficient is significantly different from zero, is positively related to total debt and long-term debt when using the FEM and REM models (see Table 3.18).

Table 3.18: Nigeria Panel Data Regression Results (1999 – 2003)

Explanatory variable	Fixed Effects Model			Random Effects Model		
	Total Debt ratio	Short-term debt ratio	Long-term debt ratio	Total Debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	0.06 (2.94)***	-0.0003 (-0.03)	0.06 (5.94)***	0.06 (3.20)***	0.001 (0.06)	0.06 (3.56)***
Size	-0.07 (-1.93)*	0.02 (1.30)	-0.09 (-2.88)***	-0.004 (-0.14)	0.03 (1.78)*	-0.10 (-0.59)
Tax	0.003 (0.37)	0.0003 (0.07)	0.003 (0.37)	0.004 (0.48)	0.0002 (0.04)	0.01 (0.89)
Asset tangibility	0.06 (5.03)***	-0.003 (-0.03)	0.06 (5.94)***	0.05 (4.88)***	-0.004 (-0.66)	0.06 (6.31)***
Age	0.02 (2.62)***	-0.0002 (-0.07)	0.02 (2.98)***	-0.002 (-1.15)	-0.003 (-1.57)*	-0.0004 (-0.37)
Constant	0.05 (0.21)	-0.03 (-0.25)	0.07 (0.38)	0.28 (1.76)*	0.03 (0.34)	0.14 (1.36)
F(5, 242)	6.78	0.47	9.17			
Prob > F	[0.000]	[0.802]	[0.000]			
Wald χ^2 (5)				26.27	4.74	42.24
Prob > χ^2				[0.000]	[0.448]	[0.000]
No. of observations	306	306	306	306	306	306

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

The profitability coefficients are significant at the 1% level, as can be seen in Table 3.18. This result shows that firms in Nigeria do not seem to be following the pecking order theory. The same result was found when the cross section data was used.

Even though the tax variable was insignificant in both models and for all the measures of leverage it had the correct sign, implying that firms in Nigeria probably take advantage of tax deductibility. Asset tangibility was, by and large, positively related to leverage. This implies that firms in Nigeria use their asset bases as collateral to access debt markets. Age is positively related to total debt and long-term debt in the FEM. The age coefficients in the total debt and long-term equations are significant at 1% level (see FEM in Table 3.18). In the random effects model, the age coefficient is negative and significant at 10% level of significance. We find some mixed results on the relationship between size and leverage. In the FEM, there is an inverse relation between leverage, as measured by both total debt and long-term debt, and size. In the random effects model (REM) there is a positive relationship between leverage, as measured by short-term debt, and size.

All the models, with the exception of the total debt model using the FEM, are globally significant at 5% level of significance. The Hausman test also tells us that the FEM is the appropriate model for the total debt regression equation.

3.11.4 Panel Data Results on South Africa

Table 3.19 shows the results for the South African data. The results show a negative relationship between leverage and profitability. The profitability coefficients are significant at the 1% level of significance. The results are robust to the use of either the REM or FEM. The size variable is also significantly positively related to the different measures of leverage while the tax variable, using the two models, is insignificant when using all the different measures of leverage. Asset tangibility is significant in all cases but is positively related to total debt and long-term debt while it is negatively related to short-term debt. In the FEM age is positively related to long-term debt but negatively related to short-term debt. As can be seen from the figure below the results from the FEM and REM are not significantly different.

Table 3.19: South Africa Panel Data Regression Results (1990 – 2004)

Explanatory variable	Fixed Effects Model			Random Effects Model		
	Total Debt ratio	Short-term ratio	Long-term debt ratio	Total Debt ratio	Short-term ratio	Long-term debt ratio
Profitability	-0.04 (-3.27)***	-0.05 (-4.21)***	0.009 (0.78)	-0.05 (-3.43)***	-0.05 (-4.75)***	0.01 (0.74)
Size	0.05 (4.68)***	0.07 (7.84)***	0.005 (0.71)	0.05 (6.23)***	0.06 (7.67)***	0.002 (0.24)
Tax	0.001 (0.62)	-0.001 (-0.65)	0.001 (1.42)	0.001 (0.68)	-0.001 (-0.61)	0.001 (1.42)
Tangibility	0.155 (5.57)***	-0.153 (-6.82)***	0.3 (13.38)***	0.14 (5.21)***	-0.16 (-7.24)***	0.30 (14.23)***
Age	0.840 (0.94)	-2.66 (-3.71)***	3.50 (4.92)***	-0.57 (-1.12)	-1.44 (-3.02)	0.39 (1.04)
Constant	0.137 (2.51)**	0.163 (3.70)***	-0.03 (-0.59)	0.19 (3.60)***	0.67 (3.76)***	0.02 (0.44)
F(5,1270)	20.031	24.55	42.62			
Prob > F	[0.000]	[0.000]	[0.000]			
Wald χ^2 (5)				95.98	128.98	207.85
Prob > χ^2				[0.000]	[0.000]	[0.000]
No. of observations	1365	1365	1365	1365	1365	1365

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

Concerning the choice between the REM and the FEM, we used the Hausman test and found the following. For the total debt ratio the results show a test statistic of 9.80. The critical value from the chi-squared table is 9.48, which is less than the test statistic value. We therefore reject the null hypothesis that there is no correlation between the unobserved effects and the observed explanatory variables and conclude that the FEM is the appropriate model. All the models here are found to be globally significant at the 5% level of significance. We also conducted the Lagrange Multiplier test to test for random effects and found that there is no random effects. The Hausman and the Lagrange Multiplier tests inform us that the FEM model is the appropriate model to use.

We also tested for firm effect. The hypothesis of the test is that there is not individual or firm effect. That is,

$$H_0 : \mu_i = 0 \quad \forall i = 1, \dots, n$$

$$H_1 : \mu_i \neq 0$$

To conduct the test we use the F-test. In this case $F(90, 1269) = 26.51$ and the $Prob > F = 0.0000$. We therefore do not accept H_0 and conclude that there are individual effects. This implies that the pooled regression model is not an appropriate model for the total debt ratio model. We did the same for short term and long term debt models and found that the firm effects are important.

3.11.5 Panel Data Results on Zimbabwe

Table 3.20 shows the results for the regressions conducted using the Zimbabwean data. Profitability is negatively and significantly related to short-term debt and size is significantly positively related to leverage. This result is robust to changes in leverage measures as well as to the change in the model used. In the REM, short-term debt is significantly and positively related to corporate tax. The tax coefficient is significantly different from zero at 5% level of significance. Long-term debt is however negatively related to corporate tax and the tax coefficient is significant at 10% level of significance. Age is significantly negatively related to leverage. The Hausman test tells us that the FEM model is the most appropriate for the total debt regression equation. Asset tangibility is significantly and negatively related to leverage, as measured by both short-

term debt and total debt. Long-term debt and asset tangibility are positively related, confirming our earlier suggestion on the other countries that collateral is largely used to secure long-term debt.

Table 3.20: Zimbabwe Panel Data Regression Results (1991 – 1995)

Explanatory variable	Fixed Effects Model			Random Effects Model		
	Total Debt ratio	Short-term debt ratio	Long-term debt ratio	Total Debt ratio	Short-term debt ratio	Long-term debt ratio
Profitability	-0.18 (-1.30)	-0.20 (-1.94)*	-0.05 (-0.25)	-0.14 (-1.08)	-0.19 (-1.97)**	-0.003 (-0.03)
Size	0.17 (7.59)***	0.08 (5.11)***	0.09 (5.17)***	0.12 (6.45)***	0.06 (4.49)***	0.05 (3.97)***
Tax	-0.03 (-0.49)	-0.12 (-0.26)	-0.05 (-0.92)	0.04 (0.57)	0.10 (2.12)**	-0.08 (-1.69)*
Asset tangibility	-0.35 (-3.31)***	-0.37 (-4.85)***	0.02 (0.25)	-0.28 (-3.29)***	-0.37 (-5.92)***	0.1 (1.66)*
Age	-0.73 (-4.25)***	-0.01 (-3.66)***	-0.01 (-2.91)***	-0.0007 (-0.99)	-0.0003 (-0.53)	-0.001 (-1.30)
Constant	0.74 (3.22)***	0.74 (4.50)***	0.14 (0.80)	-0.07 (-0.75)	0.19 (2.78)***	-0.23 (-3.46)***
F(5, 143)	12.77	6.41	10.88			
Prob > F	[0.0000]	[0.0000]	[0.0000]			
Wald χ^2 (5)				42.87	52.64	46.56
Prob > χ^2				[0.0000]	[0.0000]	[0.0000]
No. of observations	185	185	185	185	185	185

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

3.12 Evaluation of the Model Specification

3.12.1 Tests for Non-Linearity

We used the Regression Specification Error Test (RESET) to test the validity of imposing a linear functional form upon our models of regression. According to Davidson and Mackinnon (1999) the idea of RESET is to test the null hypothesis that:

$$\mathbf{y}_t = \mathbf{X}_t \boldsymbol{\beta} + u_t, \quad u_t \sim IID(0, \sigma^2),$$

where the explanatory variables $\mathbf{X}_t$ are predetermined with respect to the error terms $\mathbf{u}_t$ against the alternative that $E(\mathbf{y}_t / u_t)$ is a nonlinear function of the elements of $\mathbf{X}_t$. The simplest version of RESET then involves regressing $\mathbf{y}_t$ on $\mathbf{X}_t$ to obtain fitted values of $X_t \hat{\boldsymbol{\beta}}$ and then running the regression: $\mathbf{y}_t = \mathbf{X}_t \boldsymbol{\beta} + \gamma(X_t \hat{\boldsymbol{\beta}})^2 + u_t$. The test statistic is the

ordinary t-statistic for $\gamma = 0$ (Davidson and Mackinnon, 1999). A model is deemed correctly specified if the parameters γ are not significantly different from zero. To conduct this test in the context of the fixed effects models of the different measures of leverage, higher powers of $X_i\hat{\beta}$ were added to the original equation. The t-values and the p-values of γ for the different equations are insignificant in most cases, thus supporting our decision to use the linear models employed in the foregoing tests.

3.13 Country Factor Determinants of Leverage

The aim of this section is to assess whether there is a significant difference between leverage determinants in the different sample countries. For this we follow Booth *et al.*'s (2001) methodology and regress the different measures of leverage on the country dummies for the period 1999-2003. In order to avoid the dummy trap, we chose South Africa as the reference country; hence we have dummies for Kenya, Nigeria and Ghana. Zimbabwe was excluded for this particular exercise because of its data problems. The results in Table 3.21 must therefore be interpreted as the significance of the debt ratio differences relative to South Africa's. The results show that Kenya and Nigeria have lower debt levels as compared to South Africa. This may be due to the fact that the debt markets in South Africa are better developed as compared to those in other African countries. Thus the firms in South Africa may be accessing loans with relative ease as compared to those in other countries. Debt levels in Ghana, as measured by total debt and short-term debt, are however higher than in South Africa.

The Ghana results in the short-term equation actually reinforce the argument that firms operating in environments where banks are the major sources of debt tend to rely heavily on short-term debt. This section helps us to explain capital structure of firms by knowing the nationality of the firms. In this case we can say that the firms in Kenya and Nigeria are likely to have lower leverage as compared to those in South Africa. Taking into account the fact that the South African financial markets are as developed as most markets in some developed countries, we can conclude that the countries in our study are likely to have lower leverage as compared to South Africa and some developed economies.

Table 3.21: Pooled regression using country dummies to capture country factors

Explanatory variable	Total Debt ratio	Short-term debt ratio	Long-term debt ratio
Intercept	0.54 (25.3)***	0.39 (17.7)***	0.15 (9.97)***
Kenya	-0.10 (-2.18)**	-0.10 (-1.50)	-0.03 (-0.89)
Nigeria	-0.31 (-9.14)***	-0.28 (-8.20)***	-0.03 (-1.06)
Ghana	0.10 (1.09)	0.11 (2.33)**	-0.06 (-1.65)*
Number of Observations	1006	1006	1006
Wald chi2(3)	97.98	89.71	3.28
Prob > Chi2	0.000	0.000	0.3506
R-squared	0.28	0.29	0.02

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

The next step is to combine the firm-specific factors and the country dummies. The results of that investigation are as shown in Table 3.22. Profitability was found to be negatively related to both total debt and short-term debt ratios. It was however positively related to long-term debt. Size was found to be positively related to both total and short-term debt ratios. Asset tangibility was found to be positively related to total debt and long-term debt ratios but negatively related to short-term debt. Concerning country specific factors as captured by the dummies we find that most firms have debt levels that are lower than those of firms in South Africa. From this section's results it seems that total debt ratio is positively related to asset tangibility, size and tax rate, but negatively related to profitability. This implies that larger firms with bigger asset bases tend to borrow more. Some pecking order and information asymmetry behavioural aspects are present in SSA.

Table 3.22: Pooled Regressions Results with country dummies and firm specific factors

Explanatory variable	Total debt ratio	Short-term ratio	Long-term debt ratio
Intercept	0.23 (3.12)***	0.2 (3.12)***	0.1 (1.13)
Asset tangibility	0.03 (3.34)***	-0.02 (-3.05)***	0.05 (7.45)***
Profitability	-0.01 (-0.37)	-0.03 (-2.98)***	0.03 (2.47)**
Size	0.05 (4.66)***	0.04 (4.31)***	0.01 (1.29)
Tax	0.0002 (0.17)	-0.00005 (-0.06)	0.0002 (0.23)
Age	-0.001 (-1.06)	-0.001 (-1.90)*	0.00001 (0.00)
Kenya	-0.11 (-2.35)**	-0.10 (-1.36)	-0.04 (-1.30)
Nigeria	-0.34 (-9.68)***	-0.28 (-8.32)***	-0.10 (-2.42)**
Ghana	-0.10 (-1.15)	0.02 (0.43)	-0.08 (-2.19)**
Number of Observations	1003	1003	1003
Wald chi2(3)	139.9	121.78	66.88
Prob > Chi2	0.000	0.000	0.000
R-squared	0.29	0.30	0.07

t- statistics are in parenthesis and *, **, *** show levels of significance at 10%, 5% and 1% respectively.

3.14 Conclusion and Policy Implications

The analysis of the data from the five countries educated us on a number of issues. The first issue concerns the extent to which the firms in the different countries are leveraged. The data shows that in terms of leverage (especially as measured by the total debt ratio), the firms in Africa are roughly levered to the same extent as those in other developing economies such as Mexico, Thailand, Brazil, South Korea, Malaysia, Jordan and Turkey. However, when one further looks at the maturity of debt, one finds that African firms tend to use more short-term debt as compared to long-term debt. For example, the long-term debt ratios for the African firms analyzed was found to be in the 12% - 17% range while that of developed economies was found to be in the 28% - 48% range. This probably informs us that African governments need to create an enabling environment that can see the active participation of the private sector in the bond markets, whereby

more financial institutions create financial intermediation vehicles that permit firms to borrow funds for longer periods.

The second important lesson is that in all sample countries' analyses of capital structure, profitability is, by and large, negatively related to leverage. This implies that more profitable firms in Africa tend to use retained earnings to finance assets before considering borrowing. Whilst this may be in support of the pecking order theory there may be more than just the pecking order theory at play here. Factors such as debt covenants, property rights issues, governance and enforceability of contracts may actually force firms to rely on retained earnings instead of debt whenever they face a financing deficit. (See Kaniki, (2007) for detailed evidence on this view). Given that the pecking order theory is based on information asymmetry it seems that models based on information asymmetry may be more suitable for African environments in which the degree of information asymmetry is very high. The implication is that African governments must make some concerted efforts to reduce the degree of information asymmetry. Akerlof (1970) argues that the degree of information asymmetry, if it is very high, can result in a market failing to exist.

The third lesson is that asset tangibility, whilst expected to be positively related to leverage (in the collateral role), is actually negatively related to debt in most countries in the sample. The reason proffered in the literature as to why leverage and asset tangibility may be positive related is that a firm with a strong asset base may actually use those assets as collateral to secure loans. The important question then becomes: why are African firms not using their assets to secure loans? Is it because banks are not accepting the assets as effective collateral? Maybe they cannot put a true market value on the assets-in-place because the secondary markets for these assets are poor in Africa (Collier and Gunning, 1999; and Kaniki, 2007). Or is it because of problems with the enforceability of contracts? The other reason may be the ineffectiveness of credit markets in developing economies (Demirguc-Kunt and Maksimovic, 1994). The third reason, and probably the most plausible one in our case, is that debt funding of African firms is largely of short-term nature as compared to long-term. Long-term debt, rather than short-

term debt, is usually secured via the use of physical assets as collateral. Short-term debt dominates the debt used by firms in Africa and it does not usually require collateral. Hence in most cases a positive relationship between long-term debt and asset tangibility was found. All the above reasons are plausible. Further research would go a long way verifying the preliminary findings documented here.

The fourth lesson is that country-specific factors seem to play a role in determining leverage. Most of the countries looked at seem to have lower debt ratios as compared to South Africa, which has more sophisticated and more complete national capital markets than other African countries.

Generally most firms seem to be taking advantage of tax deductibility such that in most regressions the tax rate tends to be positively related to leverage. Whilst age may be important as a determinant of leverage, in most regressions for the sample African countries this does not seem to be the case. Risk is important for firms in other countries while unimportant in others.

Table 3.23 compares our results with the theoretical expectations as well as with the findings from other studies conducted in developing and developed economies. As can be seen from the table, our results seem to agree with a number of findings from other studies. For example, our finding that profitability is negatively related to leverage is also supported by Rajan and Zingales (1995), Booth *et al.* (2001), Huang and Song (2006), Abor and Biekpe (2005) and Chen (2004). We also found that leverage (as measured by total debt ratio) was in a majority of cases positively related to size confirming findings by Wiwattanakantang (1999), Chen (2004), Abor and Biekpe (2005) and Huang and Song (2006). We were somewhat surprised by the result that showed that risk and leverage are positively related. In their study of Thai and Zimbabwean firms Wiwattanakantang (1999), and Mutenheri and Green (2002), respectively, also found the same result. Corporate tax and leverage were, by and large, positively related to leverage in our study, which is consistent with Mutenheri and Green (2002)'s findings. Asset

tangibility and leverage were largely negatively related, confirming results by Green and Mutenheri (2002), among others.

Table 3.23: A comparison of our empirical findings and other studies

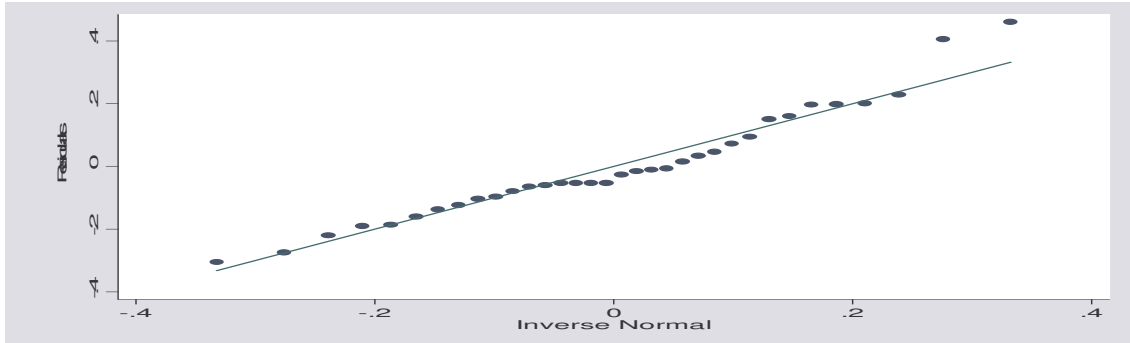
Explanatory Variable	Expected Sign	Positive	Negative	Our Findings
Profitability	Positive		Booth <i>et al.</i> (2001), Huang and Song (2006), Chen (2004), Rajan and Zingales (1995), Demircuc-Kunt and Maksimovic (1994), Abor and Biekpe (2005)	
	Negative			Negative
Size	Positive	Huang and Song (2006) Chen (2004), Abor and Biekpe (2005), Wiwattanakantang (1999)	Booth <i>et al.</i> (2001)	Positive
	Negative			
Asset Tangibility	Positive	Rajan and Zingales (1995) Wiwattanakantang (1999)		
	Negative		Demircuc-Kunt and Maksimovic (1994), Green and Mutenheri (2002), Abor and Biekpe (2005)	Negative
Risk	Positive	Green and Mutenheri (2002), Wiwattanakantang (1999)		Positive
	Negative		Abor and Biekpe (2005)	
Corporate Tax	Positive		Green and Mutenheri (2002)	
	Negative		Abor and Biekpe (2005)	Negative
Age (Reputation proxy)	Positive			Positive /Negative

Huang and Song (2006) and Chen (2004) looked at Chinese firms, Booth *et al.* (2001) looked at Brazil, Mexico, India, South Korea, Jordan, Malaysia, Pakistan, Thailand, Turkey and Zimbabwe; Rajan and Zingales (1995) looked at Japan, Germany, France, Italy, UK and Canada, Wiwattanakantang (1999) looked at Thai firms, Mutenheri and Green (2002) looked at Zimbabwean firms; and Abor and Biekpe looked at Ghanaian firms.

Chapter 3 Appendix

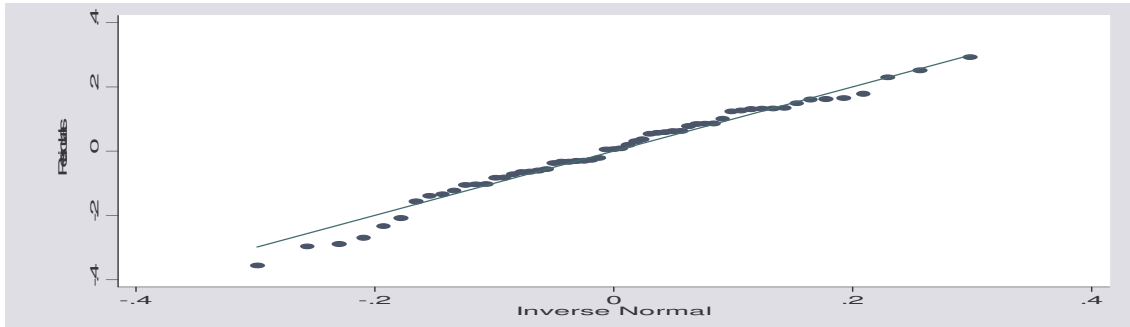
Appendix A3.1: Graphic test for normality of residual errors.

Graphic test for normality of residual errors (Kenya 1991 – 2004 cross section regression)

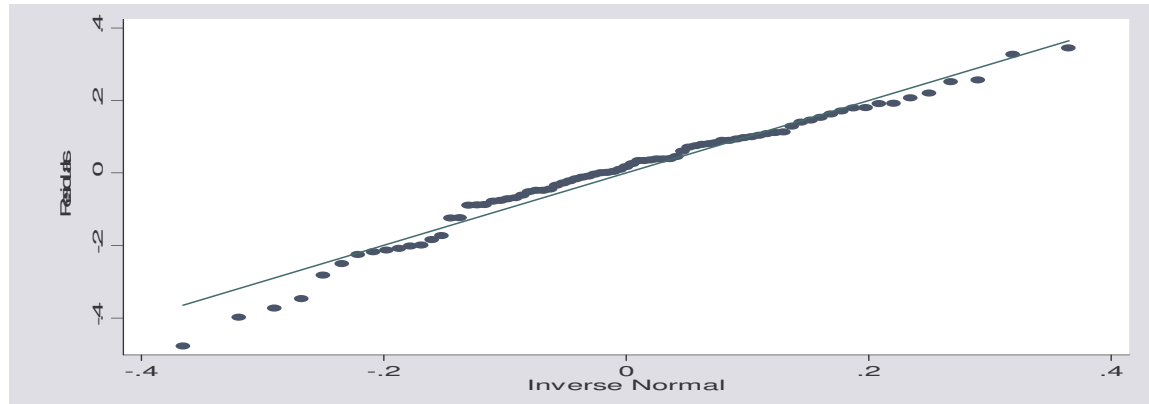


The residuals used in the above figure are based on the regression of total debt ratio on the tax rate, asset tangibility, returns on assets, age, size and risk.

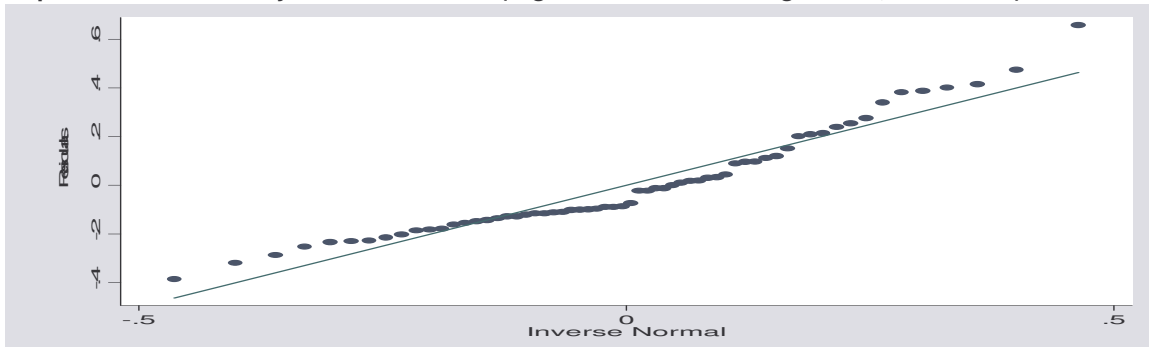
Graphic test for normality of residual errors (Zimbabwe 2000 cross section regression)



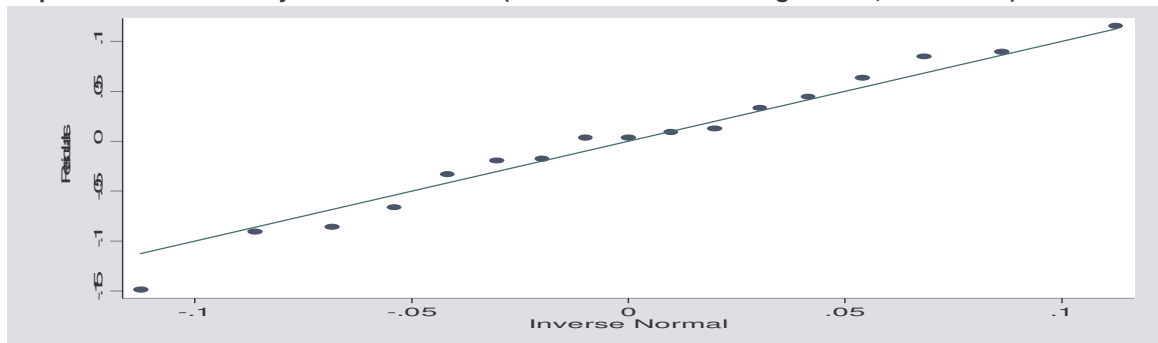
Graphic test for normality of residual errors (South Africa cross section regression, 1990 -2004)



Graphic test for normality of residual errors (Nigeria cross section regression, 1999 -2003)



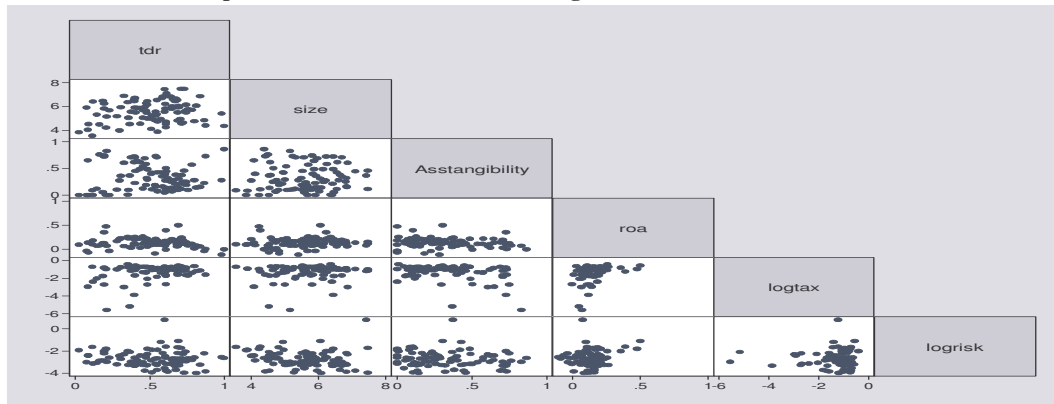
Graphic test for normality of residual errors (Ghana cross section regression, 1998 -2003)



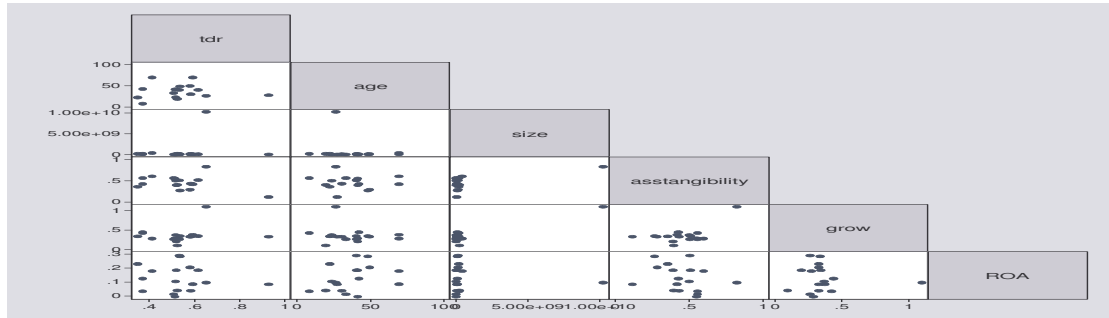
The residuals used in the above figures are based on the regression of total debt ratio on the tax rate, asset tangibility, returns on assets, age, size and risk.

Appendix A3.2: Scatter plots of variables used.

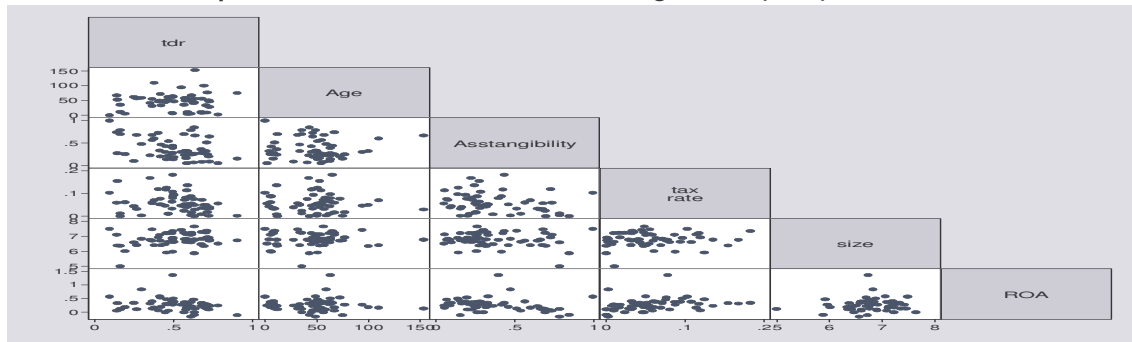
South Africa: Scatter plot of the variables used in the regression (1990 – 2004)



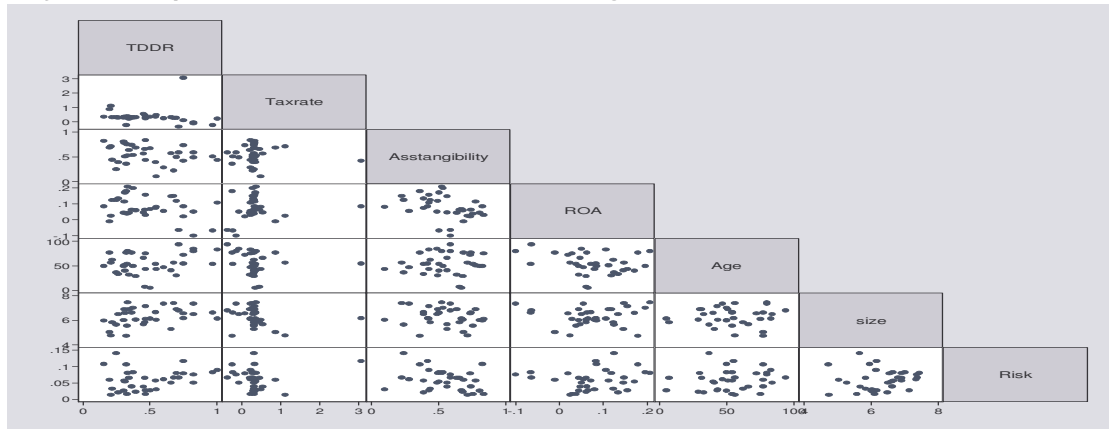
Nigeria: Scatter plot matrix for variables used in the regression (1999 -2003)



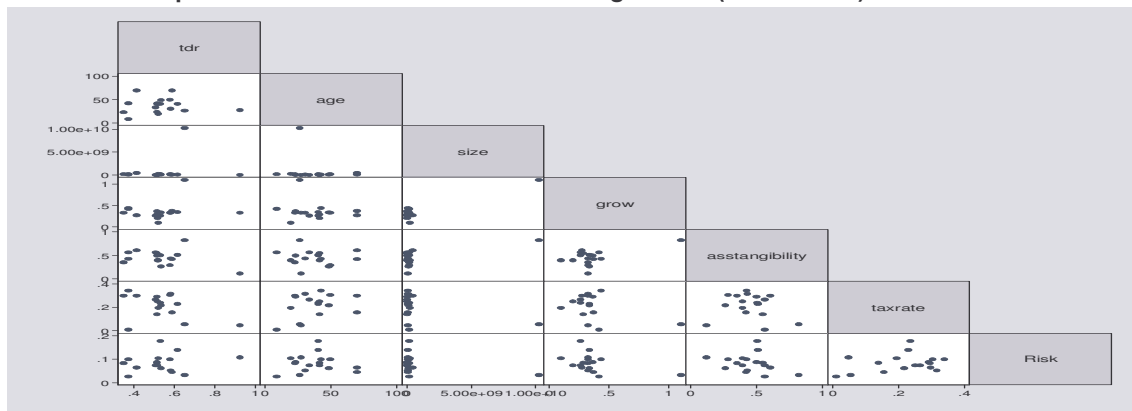
Zimbabwe: Scatter plot matrix for variables used in the regression (2000)



Kenya: Scatter plot matrix for variables used in the regression (2000 - 2004)



Ghana: Scatter plot matrix for variables used in the regression (1998 – 2003)



CHAPTER 4

DETERMINANTS OF DEBT CHOICE IN SUB-SAHARAN AFRICA

4.1 Introduction

If an African firm wants to borrow will it borrow from banks or from non-bank sources? What factors drive the use of a given debt source? Are there advantages of using bank debt vis-à-vis non-bank debt? Not much is known about the corporate debt structure of African firms. This is an important question that has not received sufficient attention in the extant literature on African firms. Most studies on this issue have been on developed and emerging economies. Those that were conducted on developed economies include Johnson (1997, 1998), Denis and Mihov (2003), James (1996), Hoshi *et al.* (1993), Anderson and Makhija (1999) and Castillo and Wright (2000). Ojah and Manrique (2005) and Alonso *et al.* (2005) both looked at debt choice by Spanish firms.

Most Africa firms find themselves in a very invidious position. Firstly, they are not listed so they cannot issue corporate bonds on bond exchanges. The debt markets that are operational in African countries are illiquid and still in their embryonic stages of development. Secondly, there are a number of environmental problems facing the firms that tend to limit the funds available to the firms. These include the fact that the degree of information asymmetry is very high, enforcement of contracts still leaves a lot to be desired and policy uncertainty and reversals are still the order of the day in most of these countries.

Under normal circumstances bank loans are more expensive as compared to public corporate debt. But firms can still favour bank debt for a number of reasons. The first reason is that borrowing from a bank can act as a good signal to other potential sources of debt. Bank signals are considered credible by other potential lenders because banks have sufficient resources to evaluate borrowers and are most likely to efficiently liquidate firms as compared to other borrowers. Sometimes, firms choose bank debt hoping that during difficult times banks do not only avail funds for investment but they can also easily renegotiate for the rolling over of existing debt. The firm also hopes that banks would expend resources and closely monitor the borrower so as not to liquidate firms that

are not supposed to be liquidated in the first place (that is, forestall inefficient liquidation).

For the client firms it is also cheaper to give one agent (the banker) direct access to information than to produce a range of publicly available information, which may be taken advantage of by competitors. (See for example, Yosha (1995) on this).

A long standing relationship with one bank can also be beneficial to the firm. This is so because such a relationship can result in less or no collateral being required by the bank since the bank after sometime manages to build a profile of the client firm which it can then use as a substitute for collateral. A long standing relationship also implies that a firm can get attractive interest rates on loans. A firm with a longstanding relationship with a bank can also escape a credit crunch during a recession when most credit providers are not forthcoming⁶⁷.

There are also a number of factors that may force a firm not to use bank debt; that is, prefer non-bank debt. A firm may choose non-bank debt instead of bank debt if it wants to avoid the extraction of monopoly rents that may result from the firm's long standing relationship with one bank. A borrower who must submit to the lender a portion of his profits over and above the normal interest rate on loans may end up exerting less than optimal effort (Rajan, 1992). Another disadvantage of using bank debt is that such loans may be from one bank with which the firm may have established an exclusive long-term relationship, which would mean that if the bank is going through difficult times the firm may fail to access loans. The market actually tends to punish such firms. The price of shares of such a firm may actually fall if its bank is going through difficult times (more of this in the literature review section). The third reason is that bank loans may be more expensive as compared to public debt, especially given that banks must keep certain reserves aside in support of deposits used to create loans. Such reserves are termed an implicit cost of bank loans by Fama (1985).

⁶⁷ It must however be noted that the dynamic interactions of a firm with a single bank can result in the firm being locked-in such that the bank can start extracting monopoly rent from the firm. This may result in sub-optimal exertion of effort by the concerned firm. See Rajan (1992) on this.

Our unit of analysis in this paper is the African firm. Our aim is to analyze the determinants of debt choice for African firms. The question of debt choice has received a lot of attention in developed economies.⁶⁸ The behavior of the African firm when it comes to raising funds through debt has not received sufficient attention. To the best of our knowledge this is the first paper in the African context to look at the determinants of debt choice using Denis and Mihov's (2003) incremental approach. Our research question is what factors determine the choice of a given debt source? In developed countries where there are other alternative sources of debt, banks still provide a significant amount of funding to firms. What is the case in Africa where the alternative sources of debt are not as developed? What role do such orthodox factors found in the extant literature like firm size, its reputation and collateral play? Do heterodox factors like education of owner or manager, ethnicity of owner or manager and export status of the firm play a role in determining a firm's choice of debt? Do firms get the kind of debt that they prefer?

4.1.1 Objectives of the study

The objectives of the study are to:

- Investigate the determinants of corporate debt structure in Africa.
- Assess whether debt choice theories developed with firms in developed countries in mind are applicable to African firms which operate in environments that are different from those in developed economies.
- Assess whether there are some heterodox factors (factors that are probably more important for African firms but play no important role in determining debt choice in developed economies) that are Africa-specific.
- Make relevant policy recommendations to enhance the debt financing of African firms.

⁶⁸Studies in developed economies on corporate debt structure include; Johnson (1997), Houston and James (1996), Hoshi *et al.* (1993), Anderson and Makhija (1999), Castillo and Wright (2000), James (1987), Carey *et al.* (1998), Denis and Mihov (2003), Ojah and Manrique (2005) and Ongena and Smith (2000).

4.1.2 Scope of the study

The study covers four sub-Saharan Africa countries. These are Ghana, Kenya, Nigeria and South Africa⁶⁹. These are among the countries that were covered in the debt-equity divide section of the dissertation. Having looked at the behaviour of the firms when it comes to raising capital using both debt and equity we now want to look at debt choice by the firms. From the pecking order theory we know that most African firms prefer internal funds to external funds and if they are forced to go for external funds they choose debt sources next, only resorting to equity after exhausting the internal and debt sources. But there are different types of debt that the firms can choose. It can be bank debt or non-bank debt⁷⁰. What factors force a firm to choose a given type of debt? We use data from the World Bank's Investment Climate Assessment surveys. The data methodology gives a description of the data in more detail.

The sample is made up of both listed and unlisted firms. The ideal source of data for this kind of research would have been the annual statements of the concerned firms. But for African firms getting the required information is difficult. The annual statements provided by the firms do not show the different sources of debt. Even in the case of developed economies like the US, Johnson (1997) ended up gleaning such pertinent data from the footnotes of the annual reports. We therefore believe that in due course, as more data on African firms become available more detailed research can be done using such data. Using data from annual reports also makes it easy to compare the research results with those done in developed economies.

Using the data from the World Bank's Investment Climate Assessment surveys however helps us to compare the firms from the different countries that were surveyed using the same survey instrument. The number of firms covered is also relatively large as compared to the small number of listed firms in most SSA stock exchanges. So using such survey data would give us more degrees of freedom as compared to using data from listed firms only.

⁶⁹ Zimbabwe was dropped for this analysis because it was not included in the World Bank's Investment Climate surveys. We used the data from the surveys for this particular section of the thesis.

⁷⁰ In this case non-bank loans are any loans that do not come from banks. They can be from insurance firms, government or donor facilities, micro-finance, from other firms, and from other firms as trade credit or as lease.

4.1.3 Justification of the study

The slow growth of African economies is a multi-faceted problem that requires a multi-pronged programme of action. On the macro-level, issues like macroeconomic and political stability are of paramount importance. At micro-level, growth of firms is critically important. The growth of firms is however dependent on a number of factors including access to cheap finance, efficient contract enforcement, rule of law, respect of property rights and protection of creditors.

One micro-unit whose growth is pivotal for sustainable economic growth is the firm. Firm growth combats poverty in two ways. Firstly, fast-growing firms tend to create jobs thus generating more income for both employees and owners of the firm. Secondly, growth of firms also generates revenue for the government through taxes. Such income collected by the government can be reallocated to the poor thus ensuring that the benefits of economic growth trickle down to the poor.

One obstacle to the growth of firms is access to finance. The data from the World Bank's Investment Climate Assessment surveys shows that the cost of and access to finance is considered to be some of the critical factors that affect firm growth. One needs to know whether there is one particular source of funds favoured by firms. If there is such a source are the firms getting access to funds through it? An understanding of the different kinds of problems faced by the different firms helps us realize that firms do not necessarily face the same problems, and where they do, the problems may not be of the same severity. For example, access to and cost of finance may be a problem that is acute for small firms and not large ones. Knowing which firms face which problems can facilitate the formulation of effective policies.

In Africa there is a need to understand how firms raise capital, in general, and debt funds, in particular. This is especially so given that African firms operate in a different, and probably very difficult, environment as compared to firms in developed economies. The absence of well-developed debt markets in Africa means that the African firm's choice menu is limited as compared to its counter parts in the developed countries. More

importantly, the African firm must deal with problems like high degree of information asymmetry, inefficient enforcement of contracts, and property rights that are not appropriately defined. At the macro level, the firm has to deal with macroeconomic and political instability. It would therefore be interesting to find out how the firm raises its debt funds in such an environment characterized by relatively high levels of uncertainty.

4.2 Literature Review on Debt Choice

In an environment characterized by information asymmetry there are always tensions between management and shareholders on one hand, and between shareholders and debtholders on the other (Jensen and Meckling, 1976; Jensen, 1986; and Myers and Majluf, 1984). In the former case, the problem arises because the interests of management and those of shareholders may not be optimally synchronized while in the latter case, existing shareholders may want to appropriate debtholders' wealth. Many theories have thus been propounded in an attempt to explain how firms raise capital in an environment characterized by asymmetric information. These include trade-off, pecking order and agency theories (Jensen and Meckling, 1976; Myers and Majluf, 1984; Modigliani and Miller, 1958; Ross, 1977 and Leland and Pyle, 1977). Contributions by Modigliani and Miller (1958, 1963), Myers (1977, 1984, 2001), Rajan and Zingales (1995), Myers and Majluf (1984) and Ross (1977), among others, were largely looking at the mix between debt and equity in developed economies. The aim of this section is to look at the debt choice literature. According to the pecking order theory, firms prefer internal to external funds and if they need external funds then they prefer debt to equity. If firms choose debt what kind of debt do they choose? Do they approach the sources of funds directly as would occur through direct private placements? Do they choose bank debt or non-bank debt? This part of the thesis seeks to examine the determinants of debt choice. This section is made up of three parts. The first part looks at the special role of banks⁷¹. Parts two and three look at theoretical and empirical literature reviews, respectively.

⁷¹ Even in developed economies where the equity markets are well developed the proportion of bank debt in total debt is quite significant (Gorton and Winton, 2003). According to Hoshi *et al.* (1993) in 1975 more than 90% of the corporate debt in Japan was bank debt. This figure fell to 50% in 1992. In Canada, the UK, the USA, Italy and Germany during the period 1970 – 1985 the percentage of firm investment financed by bank loans were 15%, 7.65%, 24.4%, 27.7% and 12.1% respectively. These figures are significant if one considers the fact that about 65% of the investment funds during the same period came from retentions.

4.2.1 The existence and uniqueness of financial intermediaries

Firms that need debt do not necessarily need to borrow from the banks. They can directly approach investors in the capital markets. The fact that firms still approach banks for loans implies that banks play a special role which can not be performed by the other suppliers of debt - banks are special. There is ample evidence to prove that banks are special. That is, there are a number of things that banks accomplish which the capital market cannot. In other words, the net benefits of getting a bank loan may outweigh the net benefits of public debt hence the pervasive use of bank loans, even in economies with well developed capital markets. In developing economies, where the capital markets are not well developed, the concentration of bank debt is even higher than in more developed economies⁷². This makes our study of debt choice more important.

A number of researchers have looked at the uniqueness of banks: Fama (1985); Mikkelsen and Partch (1986); Lummer and McConnell (1989); Slovin *et al.* (1993); and Hoshi *et al.* (1990, 1991). Fama (1985) looked at the impact of reserve requirements. He argued that because banks are required to hold reserves against different liabilities (e.g., certificates of deposits) then for each unit of certificates of deposits (CDs) issued the bank can only invest a fraction of that. This means that reserve requirements act like a tax (Gorton and Winton, 2003). Fama argued that this tax falls on the borrowers. If banks are not providing a service to compensate for this extra cost to the borrowers then borrowers would be better off borrowing from non-bank sources. The fact that firms still approach banks implies that banks must be providing something special (Fama, 1985). Fama partitioned debt into inside and outside debt. He defined inside debt as a contract where the lender has access to information from a firm's decision process which is not publicly available (e.g., bank loans and private placements). He defined outside debt as publicly traded debt where the lender relies on publicly available information concerning the firm, (e.g., publicly traded corporate bonds, commercial paper, banker's acceptances and bank CD's).

⁷² It must be noted that firms in developed economies like Germany and Japan still make heavy use of bank debt because their financial system is bank-based and not market based as in the USA and UK, for example.

The special services provided by banks identified by Fama include that bank loans are useful in that they reduce or avoid duplication of information costs. Fama posits that bank loans are short-term and usually renewable. The renewal process of the loans implies that other agents who may have payoff claims on the firm need not undertake similar evaluations.

Given that banks have enough resources to evaluate borrowers their signals are credible. Because bank signals are valuable, argues Fama, firms may actually purchase lines of credit (which they may not use) for the purpose of providing a signal about outside debt to be issued publicly rather than held by banks. In other words, for some firms it is cheaper to give one agent (the banker) direct access to information than to produce a range of publicly available information.

The other source of banks' comparative advantage is that banks have cost advantages in making loans to depositors since the ongoing relationship between the banks and firms as both depositors and borrowers provides information to banks that enables the banks to assess the risks of loans at lower costs than other lenders. These repeated interactions between the banks and firms are especially beneficial for making and monitoring short-term loans usually offered by banks (Fama, 1985 and Slovin *et al.*, 1993). According to Boot (2000), relationship banking helps overcome the information asymmetry problem and as such is one of the major reasons why banks exist⁷³. See the benefits and costs of relationship lending in the next section.

One drawback of Fama's paper is that it did not explain why firms tend to have both bank loans and public debt on the liabilities side of their balance sheets. Fama's research however spurred other insightful works. Slovin *et al.* (1993) looked at the value of bank durability and found that a bank failure can adversely affect the value of a client firm. They examined the effect on client firm's value of the near-failure and rescue of Continental Illinois Bank, USA and found that the bank's near failure saw a drop in the

⁷³ Boot (2000) defines relationship banking as the provision of financial services by a financial intermediary that invests in obtaining customer-specific information and that evaluates the profitability of these investments through multiple interactions with the same customers over time.

share prices of the bank's client firms but when the bank was rescued by the Federal Deposit Insurance Corporation the value of the firms improved. They concluded that bank financial distress harms client firms because of their loss of relationship-based cost advantages associated with bank lending. This effect is however mitigated if the firm has access to public debt markets (Diamond, 1991; Rajan, 1991 and Ongena *et al.*, 2000). In support of Slovin *et al.* (1993), Djankov *et al.* (2000) also found that announcements of bank closures in Indonesia, Korea and Thailand during the period 1998 -1999 adversely affected share value of the banks' client firms.

Lummer and McConnel (1987), James (1987), Billet *et al.* (1995) found that announcements of bank loan renewals increase client firms' share prices. Slovin and Young (1990) found that banking relationships tend to reduce under-pricing of initial public offerings of ordinary shares. In Cai *et al.* (1999), bank lending creates positive externalities as it improves the contracting environment for other public debt providers. Focusing on the maturity structure of Japanese corporate debt issue, they found that a higher concentration of bank debt results in public debt of longer maturity. In Bae *et al.* (2002), adverse shocks to banks have a negative effect on the value of client firms. Using an event-study approach and a sample of Korean banks and firms, Bae *et al.* found that firms' shares tend to perform worse on days when their banks' stock prices performance deteriorates. Ongena *et al.* (2000), however, found the impact of bank financial distress on client firms for Norwegian firms to be small and insignificant. They attributed the result to the availability of other sources of financing like equity markets.

4.2.2 Theoretical Determinants of Debt Choice

Economic agents respond to incentives. In an environment characterized by information asymmetry the adverse effects caused by moral hazard and adverse selection must be addressed. In this section of the literature review we consider the behaviour of both the borrower and the lender given the likelihood of *ex-ante* and *ex-post* opportunism that may force the borrower or the lender to behave in a way that is exclusively beneficial to him or her. The analysis has been divided into three sections that are not necessarily mutually exclusive. In the first section we look at the incentive to monitor as well as the costs

thereof. The second section looks at moral hazard problems and the last section looks at models based on the efficiency of liquidation decisions.

4.2.2.1 Models based on monitoring and information costs

Diamond (1984) develops a theory of financial intermediation aimed at minimizing the cost of monitoring information useful for resolving incentive problems between borrowers and lenders. Not only did Diamond provide the first coherent explanation for the existence of financial intermediaries but he also identified and solved the “monitoring the monitor” problem inherent in the relationships between depositors, financial intermediaries and the borrowers (Gorton and Winton, 2003). According to Diamond, financial intermediaries receive deposits from depositors (Diamond also called the depositors lenders) which they then offer to borrowers as loans. The financial intermediaries monitor the borrowers, essentially on behalf of the depositors (i.e., delegated monitors). The problem that Diamond identified is that in an environment characterized by information asymmetry, who monitors the delegated monitor? He solved this problem by showing that the financial intermediary need to commit to pay an interest rate to the depositor which can only be honoured if and only if the financial intermediary has indeed monitored efficiently as per the expectations of the depositors. He further argues that the probability that a financial intermediary will honour that commitment increases with its size. Thus depositors need not monitor the financial intermediaries as long as it can pay the contracted interest rate. The financial intermediary also stands to damage its reputation as well as incur bankruptcy costs if it fails to honour the contracted payment. Further, Diamond shows that monitoring several lenders is costly and that financial intermediaries have economies of scale in monitoring borrowers.

While Diamond (1991) and Rajan (1992) concentrate on the choice between various forms of financing and on the inherent tension between the issuers of securities and those who purchase them, Yosha’s (1995) model uses an alternative tact and assumes away the tension between the issuers and purchasers of securities and instead focuses on the choice of different forms of financing and its impact on the interested third parties. Yosha (1995) explained why firms use multilateral financing, given its drawbacks and the advantages of bilateral financing. According to Yosha, multilateral financing entails that the

borrowing firm, in an attempt to convince lenders that the firm is creditworthy, provide detailed information to the lenders. Such information provided to the several lenders involved in multilateral lending can be easily accessed by third parties, such as the firm's competitors, thus triggering undesirable reaction from the competitors.

Bilateral financing, on the other hand, entails less information leakage and is usually characterized by a close relationship between the lender and the borrower, thus requiring less disclosure of verifiable information and thus making bilateral financing less costly⁷⁴. In Yosha's model, firms choose between bilateral financing and multilateral financing. The model identifies three categories of firms: high quality firms, low quality firms and firms that are somewhere between low and high quality. Yosha conjectures that competitors learn a lot of information concerning the issuing firm's projects. When competitors learn that a bilateral financing arrangement has been completed, they infer that the borrowing firm is attempting to conceal private information about the value of an innovation. The model thus predicts that firms with sensitive information⁷⁵ (that is those that stand to lose if private information is disclosed) borrow from a single lender while those with less-sensitive information borrow from several lenders. This is so because low-quality firms find it worthwhile to bear the extra cost of multilateral financing in order not to be perceived as being of high-quality. High-quality firms, on the other hand, prefer bilateral financing as they are perceived as being lower quality than they in fact are. For such firms, bearing the cost of multilateral financing and inducing a stronger response on the part of the rival firm is an inferior choice.

The predictions of Yosha's model are applicable not only to the choice between multilateral and bilateral financing but also in equity financing: the choice between public and private equity financing, the use of venture capital and even the decision to list on stock exchanges. For example, when it comes to equity financing a high-quality firm would choose private placement by placing equity with only one investor rather than

⁷⁴ In Yosha (1995), bilateral financing is less costly but confidential, and may induce a strong response from the competitor firm who believe the borrowing firm's quality to be higher than it in fact is. Multilateral financing, on the other hand, is more costly but entails credible disclosure of private information.

⁷⁵ According to Yosha (1995), other things being equal, firms using bilateral financing are more profitable than those using multilateral financing.

several in order to avoid leakage of information. Concerning the choice between public and private offerings the model conjectures that high-quality, innovative firms will issue securities privately in order to conceal private information from product market competitors⁷⁶.

4.2.2.2 Models based on borrowers' incentives

In a situation characterized by information asymmetry how different agents try to solve the problems of *ex ante* and *ex post* opportunism results in outcomes that would be absent if there was information symmetry. In this section we look at the behaviour and the dynamic interaction of lenders and borrowers as they try to respond to different incentives before and after approval of loans. This section essentially looks at relationship banking.

Diamond (1989) looks at the dynamics of reputation formation and its ability to eliminate the conflict of interests between borrowers and lenders. He argues that, in a debt market, the behaviour of borrowers who have acquired reputation and those that do not have it is quite different. To those that have acquired reputation it is an asset that they cannot afford to lose, so they behave accordingly. Those that do not have any reputation to protect can afford to take risky projects. The incentive problems are therefore severe for borrowers with short track records and they become less so as the borrowers acquire more reputation. Firms that do not have sufficient reputation are forced to accept very restrictive covenants on debt contracts and they have to put up with financial intermediary monitoring.

Diamond's model starts with an observationally equivalent cohort of borrowers with no track record. Even though this group is made up of risky and safe borrowers they are lumped together and initially charged the same interest rate. The subsequent interest rate charged to each borrower depends on his or her track record. The whole process unravels as follows: after one period some borrowers will default other will not. Those that default

⁷⁶ Concerning the decision to go public the model postulates that young innovative private firms may be reluctant to go public fearing the reaction of established competitor firms to the disclosed information. The firms may, for the same reason, use funds from venture capitalists rather than funds from several lenders.

make it easier to identify the non-defaulters – thus reducing the proportion of those with risky projects⁷⁷. In the second period the interest rate charged this group is smaller than that charged in the first period. Those that default in the second period help to reduce the proportion of those with risky projects. The interest rate charged to the remaining non-defaulters continues to fall⁷⁸. To the borrowers therefore, reputation becomes an asset whose value increases with the low interest rate charged as the borrower acquires more reputation.

Overtime, the value of reputation rises and so the relative payoff of the risky project declines relative to the safe project (Diamond, 1989). Diamond concludes that in the presence of widespread adverse selection an equilibrium path for a borrower with access to both types of projects is to choose risky projects when young (nothing much to lose in terms of reputation) and, if able to survive for a reasonable period without default, to then switch to safe projects.

The model predicts that, if a financial intermediary can help control the project, firms with short histories (i.e., low levels of reputation) will borrow from financial intermediaries. The firms use this time to acquire reputation. Firms that have long histories have acquired sufficient reputation and thus have good credit rating to borrow publicly. In Diamond (1991), firms operating in an environment where moral hazard is widespread have an incentive to build or acquire reputation. To acquire this reputation firms initially borrow from banks and as they repay the monitored bank loans, they establish a good track record which enables them to then borrow cheaply from the arms-length debt markets.

According to Johnson (1997), firms can be categorized into young firms (with little or no reputation), older firms (with medium reputation) and quite old firms (with high reputation). Young firms fail to get bank loans because they do not have any reputational capital to protect. If they got the bank loans they could still embark on risky projects and

⁷⁷ Note that while the probability of success of a risky project is lower than that of a safe one it can still succeed.

⁷⁸ While we may be considering interest rate in this case we may also say that the debt contract of non-defaulters improves as they acquire good reputation.

benefit from the upside if the project succeeds without sharing the proceeds with the bank and yet if the project fails the firm and the bank would have to share the costs of failure. Older firms with medium reputation do not have sufficient reputation or track record to borrow from the public debt market but their reputation is adequate for them to qualify for bank loans. So they get bank loans which provide them with correct incentives and discipline, as such they do not engage in risky projects as they are still acquiring more reputation to enable them to borrow from the cheap public debt markets.

At the other end of the reputation spectrum we have the older firms that have high credit rating and sufficient reputational capital to borrow from the public debt market. They cannot afford to damage their reputation thus they have adequate incentives to borrow without being monitored and not default.

Whilst Diamond's (1991) paper managed to explain the existence of bank debt and public debt in different firms, he did not explain the co-existence of bank-debt and public debt in a single firm's balance sheet. Hoshi *et al.* (1993) developed a model that generates predictions regarding the types of firms that borrow from banks and those that borrow from the public debt markets. The model predicts that it is more efficient for a financial intermediary like a bank to monitor a firm rather than for numerous individual lenders to individually do so. Hoshi *et al.* (1993) argue that even though bank monitoring solves the problem of free-riding and non-monitoring inherent in a scenario where debt is diffusely held, it fails to solve the problem of monitoring the monitor⁷⁹. That is, banks may not have sufficient incentives to monitor the borrowers. See Diamond 1991 who identifies and solves this problem.

In Hoshi *et al.* (1993), a risk neutral manager has to choose one of two projects to invest in. These projects require the same outlay but have different payoffs. One project, call it project A, is risky as compared to another project, call it project B. The manager can get a

⁷⁹ If debt is diffusely held, no individual lender is prepared to individually bear the cost of monitoring if the benefits are to accrue to all lenders. The bank can solve this problem by pooling resources from depositors and then lending to diverse firms whom it then monitors. This does not only solve the problem of non-monitoring and free-riding but it also serves to diversify the lenders' portfolios.

private benefit from project A but not from B. Hoshi *et al.* assumes that it is socially efficient to invest in project B. But there are instances where the manager can choose project A over B if he hopes to privately benefit from the project. The model predicts that in cases where the managers prefers the good project (Project B) the manager would issue public debt and not be monitored and if he decides to invest in project A, then the manager must choose bank debt where there is monitoring.

The reason why the manager can choose project A is that the manager may be putting too much weight on the private benefits. To finance the good project the manager must pay extra cash flow in a good state to compensate creditors for losses in the case of default (Hoshi *et al.*, 1993). This means the manager would keep little of the financial payoff from the project when it succeeds, but he keeps all the private benefit from project A. According to Hoshi *et al.*, it is this difference in the manager's ability to appropriate financial and private returns that distorts the manager's project selection to the inefficient one.

Hoshi *et al.* categorizes Tobin's Q into three levels: high, intermediate and low levels. The model predicts that at high levels of Tobin's Q, the manager has sufficient incentives to invest in project B so that no monitoring is necessary so he uses public debt. At intermediate levels of Tobin's Q, the value added of Project B is high enough to offset the bank monitoring costs and the foregone private benefit such that the manager still prefers bank borrowing and invests in Project B. At low levels of Tobin's Q, the manager chooses project A and uses public debt since he does not lose much from not taking the good project. The important implication of the model is that high net worth firms are more likely to issue public debt.

Rajan (1992) wonders why, given the many advantages of bank finance, firms tend to forsake bank debt and instead use arms-length debt. He argues that the benefits of bank-debt are well understood but the costs are not. The fundamental point from Rajan's paper is that an informed bank will be able to control the borrower's decision such that a project is continued only if it has a positive net present value (NPV). This however may

adversely affect the borrower's incentive to exert effort (Rajan, 1992). Rajan considers three forms of debt – short-term bank debt, long-term bank debt and long-term arms-length debt. According to Rajan, in a situation where the borrower is getting short-term bank debt from a single bank (the case where the firm is locked-in to the bank) the borrower may be forced to share the surplus from the project with the bank in order to persuade the bank to continue to finance the project⁸⁰. It must be noted that the fact that the firm may be having good results and thus insuring that the bank's money is more or less guaranteed does not oblige the bank to issue loans to the firm. The bank can use this discretion to hold-up the firm and demand a share of the surplus in return for loans (Rajan, 1992). As a result the borrower would not exert an optimal effort thus reducing the returns of the project.

In the case where the firm gets a long-term bank debt contract it is difficult for the bank to extract rents. But this relationship is not without its own problems. This may actually cause the bank to have an incentive to bribe the firm to stop an inefficient project. For the firm, states where continuation has a negative NPV become more attractive than before – once again resulting in perverse incentives since again the firm would not exert optimal effort (Rajan, 1992). In the case of arms-length debt the lenders have no control over the firm's continuation decision. This may give the firm or owner a higher incentive to exert effort than does bank debt.

The interaction of the lenders and borrowers and how close relationships between lenders and borrowers can provide incentives for the lenders and borrowers is reviewed by Boot (2000). The interaction, proximity and the long-term relationship between the borrower and the lender facilitate monitoring and thus reduce the adverse selection and moral hazard problems inherent in an environment fraught by information asymmetry. Boot looks at the benefits and disadvantages of relationship lending. He considers the impact of competition among lenders as well as the impact of the changing environments in

⁸⁰ This is especially common in a bank-dominated market like in most developing economies as in African countries. It is possible that most firms may be forced to deal with a single bank especially when one considers the fact the decision by the firm to leave the given bank may be interpreted badly by the market such that this may adversely affect the share price of the concerned firm.

which the banks operate. Such changes include securitization, direct funding and transaction-oriented banking. He argues that such a dynamic environment does not mean an obituary for relationship lending. Rather it only changes the structure of relationship lending.

We shall now look at the benefits of relationship lending as enumerated by Boot (2000). The first benefit of relationship lending is that it facilitates a Pareto-improving exchange of information between the lender and the borrower. This is so because the borrower can reveal to the lender some information that the borrower would not reveal to the *de novo* lenders or other participants in the financial markets. Such information includes information that the borrower does not want to be accessed by the borrower's competitors. Continued interaction between the lender and the borrower, can also guarantee a continuous flow of funds from the lender to the borrower since such interaction reduces information asymmetry. Another advantage of relationship lending is that it facilitates renegotiation between the borrower and the lender. Such flexibility in debt contracts would not be possible in the arms-length debt markets (Boot, 2000; Berlin and Mester, 1992). Thirdly, relationship lending ensures that the collateral pledged by borrowing firms is also monitored. The idea here is that it is possible for borrowers to deliberately reduce the value of collateral once they get the loan. The close relationship between the borrower and the lender makes this difficult. As the close relationship between the borrower and the lender implies that the lender can focus its hawkish eyes on the collateral thus ensuring that the value of collateral is preserved.

The other benefit of relationship lending identified by Boot (2000) is that of availing loans to young firms that would otherwise fail to get loans. Recall from Diamond (1991) and Johnson (1997) that very young firms find themselves on the wrong side of the reputation spectrum such that it is very difficult for them to access loans including bank loans. The possibility of a firm-bank relationship may ensure that the firm actually accesses funds. The banks can identify potentially profitable firms and nurture them. They issue the firms with loans, and can initially make losses, but hope to recoup these losses

in the long-run from monopoly rents, for example. This is only possible if the banks envisage long-term relationships with borrowers.

Boot (2000) identifies two disadvantages of relationship lending. One is what he termed the soft-budget constraint problem. This problem is due to the fact that the proximity between the lender and the borrower may reduce the lender's toughness in enforcing loan contracts. This may see a bank extending a loan to a failing firm hoping to recover an earlier loan. This is however problematic because it may cause the borrower to have perverse incentives. If failing firms can easily renegotiate with the banks, this can make the borrower exert sub-optimal efforts in preventing an undesirable outcome from happening. Boot suggests that one way of overcoming this is to have covenants that give the bank seniority as a claimant of the firm's cash flow. This helps mitigate the issue of perverse incentives.

Another problem identified by Boot is the hold-up problem. The hold-up problem emanates from the fact that the proximity between the lenders and borrowers in the banking relationship implies that the bank acquires proprietary information that gives it monopoly. This enables it to charge high interest rates on the loans issued to the firm, thus extracting some rents from the firm (Boot, 2000; Rajan, 1992). The off-shoot to this is that firms, realizing this, may end up exerting less than optimal effort resulting in less surplus for appropriation by banks.

Some of the problems identified above can be reduced by an increase in competition among banks. According to Boot (2000), the disadvantage of inter-bank competition is that it may shorten the length of period of the relationship between a firm and a lender. This makes it difficult for the bank to invest in the gathering of costly proprietary information. Without such information, relationship lending suffers and the problems of adverse selection and moral hazard resurface.

In Longhofer and Santos (2000), the importance of bank seniority vis-à-vis other creditors is looked at⁸¹. Their conclusion is that making the bank a senior claimant gives it better incentives to monitor the firm and build relationships with firm borrowers. Such a relationship ensures that in the event of risk-shifting by the firm the bank can easily force the firm to internalize the adverse effects of such risk-shifting, especially when the firm comes to the bank for more loans during a bad state of the economy⁸². In a long-term relationship, the firms are less likely to be involved in risk-shifting as they are aware that the bank is monitoring. They would rather exert optimal efforts to ensure projects of better quality.

Longhofer and Santos focused on small business borrowers that do not have access to the public debt markets. The firms also do not have funds for investment, so they must borrow either from the bank or from trade creditors. They argue that small firms do not have access to public debt markets but they can access bank loans if there is a relationship with the bank. They can also access trade credit. But trade creditors cannot, for example, give the firm funds to pay for salaries of its workers. By establishing long-term relationships with firms, banks can understand the true quality of firms in bad states. The bank's role is especially critical during a recession when most lenders are less willing to offer loans to the small firms, particularly those with whom they have no established association.

The paper also recognizes that monitoring activities associated with building a relationship with young firms may be expensive for banks. In the absence of a long-term relationship between the firm and the bank, it would be difficult for the bank to recoup the losses initially suffered. Longhofer and Santos therefore argue that the ability of the bank to cross-subsidize the firm in its early life with rents that it earns in later agreements with the firm enables the bank to recoup these losses thus giving it an incentive to monitor the firm in the initial stages of their relationship.

⁸¹ See Rajan (1992) who found that banks should be junior to other claimants of the firm's cash flows.

⁸² According to Longhofer and Santos (2000) when the firm exerts sub-optimal efforts it is essentially risk shifting.

4.2.2.3 Models based on the efficiency of liquidation decisions

In Chemmanur and Fulghieri (1994), the role of lenders in the efficient liquidation of firms is an important factor for the firms involved. Firms look at good lenders, that is, those that would be helpful during trying times. Those lenders (i.e., banks) that help during difficult times would attract a certain type of clients. While other clients would find it better to borrow from the arms-length markets⁸³.

In contrast to Diamond (1989, 1991) who looks at reputation acquisition by borrowers, Chemmanur and Fulghieri (1994) look at reputation acquisition by lenders. In their two-period model banks are considered multi-period players in the sense that they lend in both periods and their decision during the first period affect their payoffs for the next period. As a result banks have an incentive to build reputation for financial flexibility. In the model, firms in financial distress are categorized into two groups: good and bad firms. The bad firms are those that have bad projects which would fail no matter what. Such firms must be liquidated when they are under financial distress. The good firms are those that have intrinsically good projects and are under financial distress because of temporary adverse shocks to their projects. Such firms can succeed if they get financial support from lenders.

According to Chemmanur and Fulghieri (1994), since both bad and good firms can be under financial distress it is difficult for the lenders to identify or separate the good firms from the bad ones. An efficient bank is one that liquidates a bad firm while allowing the good firm to continue under a renegotiated debt contract. In order for a lender to increase the probability of selecting the good firms and thus not liquidate them when they are in financial distress, the lenders need to expend some resources. The bondholders do not have adequate incentives to expend such resources but the banks do.

Efficient liquidation is important not only for the firms affected but for the banks as well.

⁸³ In Chemmanur and Fulghieri (1994)'s model banks do not have an advantage over bondholders when it comes to information accessibility. The advantage that banks have is that they are multi-period players as compared to bondholders who are not.

At each given time period a bank that manages to correctly liquidate a firm will increase its reputation while the one that liquidates incorrectly (that is liquidating a good firm) will see its reputation fall. The banks that manage to liquidate the right type of firms acquire reputation and would be sending a signal to the market that they will spend the resources required to correctly identify the different types of firms. It is this reputation that provides an incentive for the banks to devote resources to information production about firms in financial distress. Bondholders do not have such an incentive.

In equilibrium the firms that are large and are not risky do not care about the behaviour of lenders so they get their loans from the publicly traded debt markets. But those that are not so large have some chances of falling into financial distress so they borrow from the banks because they want the bank to renegotiate the debt contract when they unnecessarily find themselves in financial distress, say due to temporary shocks that requires some financial slack to enable them through the difficult times. Such firms are willing to pay a higher interest rate as charged by the banks.

The model by Chemmanur and Fulghieri (1994) has a number of empirical implications. Firstly, firms using bank loans will have higher chances of being in financial distress compared to those using corporate bonds or other publicly traded debt. By using firms size as a proxy for the probability of financial distress, Chemmanur and Fulghieri argue that small firms will use bank debt while larger firms will use corporate bonds. The second implication of the model is that firms are willing to pay higher interest rates to banks with high reputation for flexibility in case of financial distress. That is, such banks are more likely to be considerate and will renegotiate debt with good firms. The third implication of the model is that for the firms involved, the renewal of bank loans by reputed banks can send positive signals to the market. This is so because the banks can use their resources to evaluate the firm in times of financial distress and correctly renegotiate or liquidate the firm accordingly (James, 1987).

In Repullo and Suarez (1998), the critical role of bank debt⁸⁴ (informed finance) is that of imposing a credible threat of liquidation, whose potency falls with the liquidation values. Repullo and Suarez look at situations in which the co-existence of bank debt and public debt (uninformed finance) may be optimal as well as on the reason why bank debt is usually secured or is senior vis-à-vis other forms of debt contracts. They argue that if liquidation values are low the threat of liquidation is not credible enough such that the mixture of informed and uninformed finance becomes optimal.

The four-period model by Repullo and Suarez looks at a firm or entrepreneur who has an initial wealth which is not sufficient for a project that the firm wants to invest in. The firm has three sources of external finance: informed finance (banks), uninformed finance (public debt) and a mixture of the two. The timing of the events of the project is as follows: in period zero the firm or entrepreneur identifies an indivisible project in which he invests after borrowing additional funds from external sources. In period one he decides the level of effort to exert. This effort is monitored by the lender. Even though the level of effort does not explicitly enter the contract the lender can observe the effort exerted by the entrepreneur and makes a decision on whether or not to liquidate the firm. The liquidation decision is made in period two. In period three we have the returns of the project which we get if the entrepreneur exerted satisfactory efforts and has avoided liquidation. The above series of events can be disrupted if the informed lender liquidates the firm. An informed lender's threat of liquidation forces the borrower to exert an optimal effort. The threat of liquidation is credible especially when the liquidation values are high.

The two critical determinants of the optimal choice of finance are the firm's net worth or the entrepreneur's wealth and the liquidation value of the investment project. The model predicts that investments involving liquid and tangible assets are more likely to be funded exclusively by banks while those involving less liquid and less tangible assets are more likely to be funded by public debt. The model argues that coming from a situation where

⁸⁴ According to Repullo and Suarez (1998) bank debt can be considered to be informed debt while corporate bonds can be considered to be uninformed debt.

we have only banks as the source of debt, adding an uninformed lender reduces the funds contributed by the bank and hence restores the credibility of the threat of liquidation. The model also predicts that making bank debt senior gives the bank the right incentives to liquidate. This contrasts with Diamond's (1993) model in which the second lender comes in not to restore liquidation credibility but to prevent excessive liquidation.

According to Repullo and Suarez (1998), the predictions of the model on the optimal modes of finance are as follows: informed finance is optimal for high liquidation values and low entrepreneurial wealth (or firm net worth). For high and/or intermediate wealth, public debt (or uninformed finance) is optimal. Mixed finance is optimal for low wealth and intermediate liquidation values. If the wealth and liquidation values are very low then there is no feasible mode of finance. Where informed and uninformed finance are feasible, reducing the wealth of the entrepreneur worsens the moral hazard problem under uninformed finance but does not affect the informed lender. (Recall the informed lender monitors effort exerted and decides to liquidate if the effort is sub-optimal). Where the levels of wealth and liquidation values make mixed and/or uninformed finance feasible, reducing the wealth of the entrepreneur and increasing liquidation value in order to keep the sum of wealth and the liquidation value constant serves to worsen the moral hazard problem under uninformed finance but does not affect mixed finance. So mixed finance is optimal with low wealth and high liquidation values (Repullo and Suarez, 1998).

Repullo and Suarez conclude that highly capitalized firms would prefer public debt while poorly capitalized firms would be financed by banks; sometimes exclusively and sometimes as a mixture of informed and uninformed finance. Firms in the middle range of net worth values can be funded by banks exclusively (if they have tangible assets that are easy to liquidate). As the assets of the middle-range net worth firms become more illiquid (e.g. those firms in high-tech and services sectors) they tend to increasingly make use of public debt.

In Berlin and Loeys (1988), debt covenants, depending on the source of debt, can lead to inefficient liquidation. They consider a scenario where there are several entrepreneurs or

firms with projects but no wealth to fund the projects and there are several investors with wealth but no projects to invest in. The funds for projects can come from the debt markets (e.g., corporate bonds) or from banks. The role of the bank in this case is to intermediate between the surplus and deficit units. That is, the group of wealthy individuals without projects, call them investors, can hire a “banker” to contract with the borrowing firms on their behalf. Of course there are a number of problems with this as this creates another principal-agent problem. For example, does the bank have adequate incentives to monitor? In Berlin and Loeys (1988), a payment mechanism with an incentive-compatibility condition ensuring that the bank would have an incentive to monitor as well as to truthfully reveal the outcome of its investigation is established.

The debt contracts (bonds and bank loans) have covenants and payments requirements. The covenants grant the lenders the power to liquidate the firm if certain agreed indicators are not met. The terms of the covenants depend on information observed by the different security holders. The banks have better access to information than the bondholders. This is because over and above the public information that the bondholders have the bank can also extensively monitor the firm for the duration of the contract. On the other hand, the diffuse bondholders do not have adequate incentives to monitor⁸⁵. So the covenants for the different sources of funds are written in terms of the indicators that the different sources have access to. The bond covenants are based on imperfect information, it therefore goes without saying that such covenants will be inefficient in the sense that they tend to be too harsh, resulting in excessive default or too lenient, leading to too many unviable projects not being liquidated (Berlin and Loeys, 1998). Basically the covenants lead to inefficient liquidation.

Because the bank can extensively monitor the borrower, liquidation inefficiency can be avoided. This ensures a first-best policy which occurs when bad projects are liquidated while good ones are allowed to continue without disruption.

⁸⁵ It must be noted that even though Repullo and Suarez (1998) termed bondholders the uninformed financiers they still have information concerning the firm. They especially have access to information concerning the firm that can be gathered at low cost, for example the routine accounting information like abridged annual reports and the financial ratios therein as well as the firm’s ability to pay interest on debt on time.

4.2.3 Empirical Determinants of Debt Choice

A number of studies on debt choice determinants have been conducted. These are mainly on developed economies especially on firms in the US. Those that are on non-US firms include Ojah and Manrique (2005) on Spanish firms; and Hoshi *et al.* (1993) and Anderson and Makhija (1999) on Japanese firms. Most theoretical models on debt choice, like Diamond (1991), do not separate bank debt and non-bank debt. As a result most empirical studies on the determinants of debt choice also fail to separate the two. The studies that do not separate bank debt and non-bank debt include: Houston and James (1996), Krishnaswami *et al.* (1999), and Cantillo and Wright (2000). Those that make the distinction between bank debt and non-bank debt include: James (1987), Johnson (1997, 1998), Carey *et al.* (1998), Denis and Mihov (2003) and Ojah and Manrique (2005).

Houston and James (1996) looked at the determinants of the mix of private and public debt using 250 listed US firms for the period 1980-1990. They found that information monopolies associated with borrowing from a single bank limit the use of bank debt. They argued that multiple banking relationships or borrowing from public debt markets can mitigate the hold-up problem and thus lower the bank's information monopoly and the amount of rent that it can extract from the firms. Ongena and Smith (2000), in their study of European firms, also found supporting evidence. They found that single-bank relationships were uncommon and that many firms tended to maintain relationships with many banks. This is in contrast to Petersen and Rajan (1994) and Degreyse and Cayseele (2000). Petersen and Rajan (1994) found that even though relationship lending increases credit availability, an attempt by the firm to increase the number of lenders tends to reduce credit availability while increasing its price⁸⁶. Degreyse and Cayseele (2000) looked at small firms in Belgium and found that the loan rate is increasing in the duration of a bank-borrower relationship. They argued that this implies that there is a possibility of intertemporal rent-shifting. That is, a firm with a longer relationship with a bank tends to pay higher interest rates as compared to those with shorter relationship with a bank. They

⁸⁶ Petersen and Rajan's (1994) results were based on the data from a survey of small US firms. The survey was conducted in 1988 and 1999.

however argue that a firm that widens the scope of the relationship, by buying several products from the same bank tends to see its loan rate decrease overtime⁸⁷.

Houston and James (1996) found that bank debt is negatively related to size and leverage, implying that bigger firms tend to use less bank debt as they would have switched to publicly traded bonds (Diamond, 1991; Hooks, 2003). For small firms the benefits of bank monitoring are large as compared to the cost of information monopolies inherent in a single-banking relationship. Their results also support the findings by Johnson (1997, 1998) who found that firms that use bank debt are highly leveraged as compared to those that do not.

Johnson (1997) used a sample of 847 US firms to examine the relationship between corporate debt ownership structure and firm characteristics. Basing the estimation models on theoretical models based on monitoring and information costs, efficiency of liquidation decisions and borrowers' incentives, Johnson found that several theoretical predictions receive support while some do not. His result also suggests that there is a difference between bank and non-bank private debt.

In contrast to Diamond's (1991) reputation model which postulates that firms that have acquired reputation tend to use publicly traded bonds and not bank debt, Johnson (1997) found that firms with access to public debt continue to use bank debt. This implies that the monitoring, renegotiation and certification roles of banks are still valued by the firms that can use the cheaper debt from *de novo* lenders. Johnson's other findings include: that firms use more public debt if they face lower information and monitoring costs, lower likelihood and costs of inefficient liquidation, and have fewer incentives to take actions harmful to the lenders (moral hazard). His other important findings are that bank debt was negatively related to firm size and age and positively related to leverage and fixed

⁸⁷ Petersen and Rajan (1994) and Degreyse and Cayseele (2000) are among many that found an positive relationship between the duration of bank-borrower relationship and the loan rate. Sharpe (1990) also found the same result include. The argument is that there is a tendency for the firm to be locked into the relationship such that bank can increase the loan rate as the close relationship continues. But Boot and Thakor (1994) argues that there has to be a negative relationship between the duration of the relation and the loan rate. Their argument is that as the bank gets to know its customer it begins to save in terms of monitoring costs and that such benefits can be transferred to the firm in the form of lower costs of credit.

asset ratio. The above factors were also found to be negatively related to non-bank private debt. Age was found to be negatively related to both the bank debt and non-bank debt implying that as firms grow and become more cash rich, they tend to rely less on external funds (Myers and Majluf, 1984). In his univariate analysis, Johnson also found that firms in the sample tended to make widespread use of a combination of different debt sources. He found that 73% of the firms in the sample were borrowing from more than two sources of debt.

Johnson (1998) examined the relationship between leverage and bank debt use in an attempt to analyze the effects of bank screening and monitoring on capital structure. He used a sample of 716 non-financial US firms and found the same results as in Johnson (1997); that is, firms that use bank debt tend to be highly levered as compared to those that do not have bank debt. He found that firms with bank debt had leverage that was 41% higher than firms that did not have bank debt. In contrast to most theoretical models that lump bank debt and non-bank private debt together as if they were similar, Johnson (1998) separated the two and found that indeed there is a difference between bank debt and private non-bank debt.

Adding a new dimension to the public versus private debt debate, Carey *et al.* (1998) argue that the view, as put forward by Fama (1980) and James (1987), that banks (with the exclusion of other private intermediaries) are special may not be adequate. Carey *et al.* argue that it is private market intermediaries in general, not banks in particular, that are special. Thus it is not adequate to understand just the determinants of the choice of private debt versus public debt. The mixture of the varieties of private debt need to be better understood both from a theoretical and empirical point of view. They found that there is specialization in the private debt market, with finance companies tending to serve borrowers with higher observable risk as compared to banks. They conjectured that finance companies tend to lend to observationally riskier borrowers as compared to banks because government regulations may limit banks' ability to lend to risky firms. The other reason is that banks avoid risky firms to preserve a reputation for reasonableness in extending or renegotiation contracts.

Using a sample with information on business loans, Carey *et al.* (1998) compared private firm lending by banks to that by finance companies. They argued that the finance by banks and that by finance firms are different and the two sources of finance are special and not just banks as suggested by Fama (1980).

Cai *et al.* (1999) argued that the co-existence of bank debt and public debt in a firm's balance sheet is not a misnomer. Looking at Japanese firms and focusing on the maturity structure of their corporate debt, they found that bank lending creates positive externalities. This is because it tends to improve the contracting environment for the arms-length debt providers. They also found that firms with more bank debt tended to have public debt of longer maturity.

Krishnaswami, *et al.* (1999) examined why firms with access to public debt markets choose to finance debt through private placements as well. Using a sample of 297 non-financial firms for the period 1987–1993, Krishnaswami *et al.* used both pooled and cross sectional regressions to examine the impact of floatation costs, agency conflicts, regulation and information asymmetry on a firm's mixture of public and private debt. Their first finding is that larger firms exploit the scale economies in issuance cost of public debt and thus have lower concentration of private debt. Secondly, that firms with higher moral hazard tend to use higher proportion of private debt. This is because such firms need greater monitoring and restrictive covenants that are inherent in privately placed debt. Thirdly, firms with more growth opportunities tend to make heavy use of private debt as compared to public debt.

Krishnaswami *et al.* (1999) adopted a research design that involved dropping small firms. This is because, like most firms in African countries, most small firms do not have access to the public debt market. So their decision to use privately placed debt and little or no public debt may not have anything to do with floatation cost, moral hazard or any other information asymmetry problem but may be because they cannot access that particular source of debt (see Diamond (1991) on reputation acquisition by firms and how small firms fail to access the public debt markets).

Datta *et al.* (1999) argued that the presence of bank monitoring lowers monitoring costs for the other debtholders, especially when one considers that banks have superior monitoring ability as compared to other debtholders. This reduces agency costs and the overall cost of debt. Such cost savings are reflected through lower at-issue yield spreads for public debt. In contrast to Krishnaswami *et al.* (1999), Datta *et al.* used a sample of small firms that are just starting to issue public debt⁸⁸. Using a sample of 98 initial public offerings of private debt for the period 1971-1994, Datta *et al.* (1999) tested the hypothesis that cross-monitoring benefits due to bank debt in the firm's capital structure reduce debt related costs and hence the yield of the firm's publicly trade debt⁸⁹. They also tested Diamond's (1991) reputation acquisition argument and found that bank cross-monitoring and the length of bank-firm relationships lower the at-issue yield spread for the first public straight bond offer.

Cantillo and Wright (2000) asked the question: Do firms borrow from arm's length investors or intermediaries in a systematic way? To answer the question they collected information on 291 firms and looked at the way the firms issued different obligations for the period 1972-1992. Their results suggest that intermediaries like banks have informational advantage over multilateral lenders. Attributes that makes a firm less likely to default (like high and stable cash flow, high profitability, and low interest rates), or reduce cost of failure, induce companies to use the public bonds. They found that the determinants of lenders' choices are more important during the down swings of the business circles because it is during such periods that lenders may not be forthcoming and firms may find themselves in a credit crunch. It is the ability of the bank to reorganize the firm or to renegotiate a debt contract when a firm is in difficult times that Cantillo and Wright emphasize on.

⁸⁸ Datta *et al.* (1999) offer three reasons for their choice of small firms in their sample. The first reason is that small firms, since they do not have any track record in the public debt markets, stand to benefit the most from the bank cross-monitoring. The second reason is that firms that issued seasoned debt are monitored by both the banks and public debt holders. Selecting the small firms that are issuing initial public bonds helps to isolate the benefits of bank-cross monitoring on the at-issues yield spread for public debt. The third reason is that the small firms chosen do not have any public debt so they are a good sample to test Diamond (1991)'s reputation-acquisition argument.

⁸⁹ Cross-monitoring occurs when monitoring by one type of creditor (say bank) reduces the duplicative monitoring of other debt holders (Datta *et al.*, 1999).

Hadlock and James (2002), using a sample of 500 firms over the period 1980-1993, study the decision to choose bank debt rather than public securities in a firm's financing choice. From their sample they identified all publicly announced instances of bank loan agreements, public debt offerings and common stock offerings. They then used the data to estimate logit models that predict the likelihood that a firm chooses bank finance as opposed to other sources of financing like public debt or equity. They argue that when considering whether to choose bank debt the benefits and the costs of bank debt are looked at and compared to the cost and benefits of any other debt source that the firm may be considering. Their basic hypothesis is that banks have the ability to accurately price a firm's claims hence making firms that are undervalued by the market to choose bank debt. They found that there is an information benefit to bank debt that tends to attract undervalued firms towards using bank debt

Denis and Mihov (2003) used a sample of 1560 new debt financings by 1480 US firms to examine the choice among bank debt, non-bank private debt and public debt. They used an incremental approach to analyze the determinants. That is, they looked at changes in total debt at a given point in time and assessed whether that change is due to bank debt financing or it is from other debt sources: non-bank debt or public debt. Their work is one of the few papers on debt choice that separate bank debt and non-bank private debt. Such a separation recognizes the fact that non-bank private debt may be an important source of debt and that the two sources of debt are different. They also provided some evidence on the role of credit quality in the choice of debt sources. They also found that public debt was positively related to firm size, leverage and age. This implies that large firms that have acquired reputation overtime are highly levered and they tend to use more incremental public debt as compared to bank debt.

Hooks (2003) did a cross-sectional study of 265 non-financial US firms for the period 1991-1992. She focused on the role of firm size as a determinant of bank debt. Her findings are consistent with Diamond's (1991) theoretical model which postulates that small to medium firms tend to use more bank debt and as they acquire reputation and grow they switch to publicly traded bonds. Hooks argue that the fact that firms of

different sizes use different sources of debt including bank debt implies that it may take a very long time for banks to become redundant. That is, the banks will probably continue to play their traditional role of commercial lending even as firms shift their debt sourcing patterns.

Ojah and Manrique (2005) extended the research on corporate debt structure by focusing on the Spanish capital market. They used a two-stage empirical test methodology within the limited dependent variable analysis framework. Stage one involves looking at the factors that determine the choice of bank debt and/or non-bank debt by a firm. Stage two looks at the determinants of the amounts of bank debt and non-bank debt. That is, once the firm has chosen a given source of debt what determines the amount of debt that it has?

Ojah and Manrique's main contributions are threefold. Firstly, they extended the research to the hitherto ignored capital markets that are bereft of public debt supply. Secondly, unlike most papers in the extant literature, they managed to separate bank debt and non-bank debt (see Johnson, 1997 and 1998; who argues and found that the two sources of debt are indeed different). And thirdly, they examined factors that affect debt choice as well as those that affect the amount of a specific debt type that the firm would have sourced. They found that the propensity to use bank debt is positively related to firm size and information availability, and negatively related to credit worthiness of the firm. Expectedly, their bank-debt amount equation was explained positively by size, information asymmetry, growth potential and leverage. When it comes to the use of non-bank debt, they found that the likelihood of using non-bank debt is positively related to firm size, growth potential and leverage. The amount of non-bank debt was found to be positively related to firm size and negatively related to growth potential and age.

4.5 Hypotheses to be tested

In light of the theories explained in the literature review section, we formulate the following hypotheses.

Hypothesis 1: More profitable firms prefer less bank debt than less profitable firms

For any firm the cheapest form of finance is internal finance. Profitable firms have more retained earnings at their disposal, which they can use to fund investment. Thus they do not rush to the debt market for loans. More profitable firms also do not want the inflexibility or hold-up problems that come with bank debt. They therefore use less debt. Firms with profitable investment opportunities also tend to hide such information from competitors (Yosha, 1995). They therefore avoid issuing public debt, which requires the transference of private information from the firm to the public. Some of it may end up in the hands of rivals. To avoid this, firms with profitable investments would rather use bank debt since the information given to the bank is private information.

Hypotheses 2: Firm age is positively related to bank debt

In an environment characterized by information asymmetry, the extent of which is severe in most African capital markets, reputation is very important. Diamond (1991) argues that reputation is an asset which a firm cannot afford to lose. Firms therefore try to build their reputation not only to access debt easily but to also access cheaper debt as firms with reputation and a good relationship with creditors can negotiate for lower interest rates.

The reputation acquisition argument by Diamond (1991) states that very small firms fail to access bank debt because they do not have the requisite reputation. Firms in the middle range of the reputation spectrum have sufficient reputation to get bank loans but such reputation is not sufficient for them to access debt from public debt markets. At the end of the reputation spectrum we have big firms that have acquired sufficient reputation to access the publicly traded debt. Thus as the firm grows it switches from bank debt to public debt, implying a negative relationship between bank debt and firm size. Hooks (2003) and Houston and James (1996) found empirical evidence that support this view.

For firms in most emerging and developing economies, bank debt is the most important source of debt as public debt markets are in their embryonic stages of growth. So even if firms may have grown and acquired the requisite reputation to access public debt, they do not have the option of corporate public debt because the public debt markets are still very

small or non-existent. We therefore hypothesize that as firms grow they tend to use more bank debt. Ojah and Manrique (2005) as well as Alonso *et al.* (2005) found empirical evidence that support this view. The capital markets in most African countries are also characterized by a high degree of information asymmetry. In such an environment private creditors are better monitors than public creditors (Alonso *et al.*, 2005).

Hypothesis 3: Firm size is positively related to bank debt.

Bigger firms are more visible in the capital market. This tends to reduce information asymmetry in the market. In an environment where there is some choice between public debt and bank debt, firms would choose public debt, which is the cheaper of the two. But in most African markets, which are bereft of public debt, more visible firms are easier for banks to monitor and so they can lend to these firms without incurring high monitoring costs. In African markets, bank debt is the most dominant form of private debt. We therefore hypothesize that there is a positive relationship between firm size and bank debt.

Hypothesis 4: Firms that export have more access to bank debt than those that do not

Firms that export are more diversified than those that do not and the chances that the firms will have difficulties with cash flows with which to service their debt are lower than those that do not export. In other words, exporting firms are less risky. More succinctly, the variability of the cash flows for exporting firms is lower than that of non-exporting firms. The exporters can withstand internal shocks better than non-exporters, and generally have the reputation to access the most favoured type of debt in their environment – which is bank debt in the context of Africa.

Hypothesis 5: Asset tangibility is positively related to bank debt

Firms with high values of fixed assets have high asset tangibility. Such firms can offer such assets as collateral and secure more debt than those with less. This argument is however dependent on the rule of law as well as enforceability of contracts. If contracts cannot be enforced easily then the use of collateral may lose its appeal as lenders may not be ready to offer loans upon the presentation of collateral by firms.

Hypothesis 6: Bank debt is the dominant source of debt

Given that most African countries do not have public debt markets, bank debt is the major source of debt for purposes of investment. The other important sources of debt include trade credit and bank overdraft but these are usually used to fund working capital and rarely to fund new investments.

4.6 Methodology and Empirical Results

4.6.1 Methodology

In order to understand the determinants of debt choice, we use the limited dependent or discrete regression variable analysis. Discrete regression analysis models are models in which the dependent variable assumes discrete values. See Gourieroux (2000), Maddala (1999), Train (2003) and Greene (2003) for discrete regression analysis.

The question here is what factors or firm characteristics drive the choice of bank debt or non-bank debt? Once we have established the factors that drive the choice of a given type of debt, we then look at the same firm characteristics and assess whether the factors are important in determining the amount of bank debt or non-bank debt held by the firm.

The model to be used here is limited dependent variable model. Following the methodologies used by Johnson (1997), Denis and Mihov (2003) and Ojah and Manrique (2005), we use the probit model to figure out what drives the use of bank debt and non-bank debt. More specifically, instead of using debt in-place as used by Ojah and Manrique (2005) and Johnson (1997), we use Denis and Mihov's incremental approach. In this approach we look at the choice of debt for funding additional investment. When firms need additional funds for additional investments like new machinery and buildings, if they use debt at all, do they use bank debt or non-bank debt or both? If they choose bank debt or non-bank debt, what are the firm's characteristics that force the firm to use a given debt source?

Our focus is on the use or non-use of bank debt because in most African countries public debt markets are non-existent and where they are operating, they are still small and illiquid. Nevertheless, African firms also have the option of choosing between bank debt

and non-bank debt. For our purposes, non-bank debt is any loans from any sources other than banks. Non-bank debt includes loans from friends and family members, loans from informal money lenders, trade credit, loans from parent firms and lease arrangements. Bank loans can be from local commercial banks or from foreign-owned commercial banks. The foreign-owned banks can be located abroad or in the country concerned.

The reason why we used probit as compared to logit is because of a number of limitations associated with the logit model⁹⁰. The limitations are that it cannot represent taste variation and it exhibits restrictive substitution patterns due to the independence of irrelevant alternatives (IIA) property (see Train, 2003). The probit model, on the other hand, can handle taste variation and allows any pattern of substitution such that it is not restricted by IIA property⁹¹. The only limitation with the probit model is that it requires normal distribution for the unobserved components.

While our primary focus is on the choice between bank debt and non-bank debt, for instance, we can not ignore the full set of alternatives facing the firm. According to Train (2003), the choice set facing the firm must exhibit three characteristics. Firstly, the choice set must be mutually exclusive from the decision maker's perspective in the sense that choosing one alternative necessarily implies not choosing any of the other alternatives. Secondly, it must be exhaustive: i.e., all the possible alternatives must be included and lastly the number of alternatives must be finite. In our case there are four possible alternatives that the firm may face and these are bank debt, non-bank debt, no debt at all, and a combination of bank debt and non-bank debt.

In order to simplify matters we restricted the choices faced by the firm to two alternatives: the firm can either use bank debt or non-bank debt. We estimate two equations; one that looks at the use of bank debt and the other that looks at the use of non-bank debt. For the first equation, if the firm uses bank debt then the dependent

⁹⁰ But Kennedy (2003) argues that the choice between logit and probit is a matter of taste. Before the advent of more efficient software, most people used the logit model because it involved lower computational costs. But the advent of better software allows us to use either at minimal costs. Greene (2003) also argues that it is difficult to choose one over another on theoretical grounds.

⁹¹ In its simplest form the IIA property is a requirement that the decision to choose a given alternative must not be affected by the addition of an irrelevant alternative. For example one's decision when choosing between alternatives X and Y should not be influenced or affected by an additional decision Z, which is an irrelevant alternative to Z and Y.

variable takes a value of one. The variable takes a value equal to zero if the firm did not use any bank debt. For the second equation we look at the use of non-bank debt. The dependent variable in this case takes a value of one if non-bank debt is used and a value of zero if no non-bank debt is used.

4.6.1.1 Empirical Model Specification

Based on our objectives, theory and data availability, we specify the following model of debt choice:

$$Prob(choose\ bank\ debt) = f(firm\ characteristics) \quad (1)$$

$$Prob(choose\ non-bank\ debt) = f(firm\ characteristics) \quad (2)$$

Equations (1) and (2) show that a firm's choice of debt depends on firm characteristics. The firm characteristics are divided into two categories; orthodox and heterodox variables. The orthodox variables include asset tangibility, profitability, reputation, information availability concerning the firm and credit risk. Heterodox variables include education of senior manager or owner, firm location and ethnicity of firm owner⁹². See Table A4.5 for a description and definition of the independent variables used.

4.6.1.2 Statistical Models

The decision by the firm to use or not use bank debt is estimated using a probit model. In the model, an underlying response variable y^* is defined by the relationship:

$$y_i^* = \beta x_i + u_i \quad (3)$$

$$Prob(Y=1|X_i) = \int_{-\infty}^{x_i^*} \phi(t) dt = \Phi(x_i^* \beta) = F(x_i^* \beta) \quad (4)$$

$$Prob(Y=0|X_j) = 1 - F(x_j^* \beta) \quad (5)$$

Where $i \neq j$ and $\phi(t)$ and $\Phi(x^* \beta)$ are the standard normal density function and the corresponding cumulative distribution function, respectively. The functional form of $F(x^* \beta)$ depends on the assumptions made concerning u_i .

⁹² As stated earlier, such heterodox variables are more important in the case of African firms than in developed economies, hence their use in these model specifications.

In equations (4) and (5) we are looking at an instance where the firm either uses bank debt ($Y = 1$) or no bank debt ($Y = 0$). The decision to choose bank debt depends on firm characteristics gathered in $\mathbf{X}$. See Table A2.5 in the appendix for a list of the firm characteristics. The signs of parameters to be estimated show us whether changes in firm characteristics increase or reduce the probability of choosing a given debt source. The same specifications apply to the model with non-bank debt as the dependent variable; in which case the dependent variable would be a dummy taking a value of 1 if a firm has non-bank debt and a value of 0 if a firm does not have non-bank debt.

The probability model is the regression:

$$E(y/\mathbf{x}) = 0.[1 - F(\mathbf{x}'\boldsymbol{\beta})] + 1.F(\mathbf{x}'\boldsymbol{\beta}) = F(\mathbf{x}'\boldsymbol{\beta}) \quad (6)$$

Estimation is based on the method of maximum likelihood, which gives us the likelihood function:

$$\text{Prob}(Y_1 = y_1, Y_2 = y_2, \dots, Y_n = y_n | \mathbf{X}) = \prod_{y_i=0} [1 - F(\mathbf{x}'_i \boldsymbol{\beta})] \prod_{y_i=1} F(\mathbf{x}'_i \boldsymbol{\beta}) \quad (7)$$

For a sample of n -firms we get:

$$L = \prod_{i=1}^n (\Phi(\mathbf{x}'_i \boldsymbol{\beta}))^{y_i} (1 - \Phi(\mathbf{x}'_i \boldsymbol{\beta}))^{1-y_i} \quad (8)$$

Thus the log-likelihood is:

$$\ln L = \sum_{i=1}^n y_i \ln \Phi(\mathbf{x}'_i \boldsymbol{\beta}) + \sum_{i=1}^n (1 - y_i) \ln [1 - \Phi(\mathbf{x}'_i \boldsymbol{\beta})] \quad (9)$$

Differentiating the above equation, equating the result to zero, and solving for $\boldsymbol{\beta}$ yields the maximum likelihood estimator $\hat{\boldsymbol{\beta}}$. In the case of nonlinear models the parameters of the models are not necessarily the marginal effects (Greene, 2003). For the normal distribution as in our case the marginal effects can be computed as follows:

$$\frac{\partial E(y/\mathbf{x})}{\partial \mathbf{x}} = \phi(\mathbf{x}'\boldsymbol{\beta})\boldsymbol{\beta} \quad (10)$$

Where $\phi(\mathbf{x}'\boldsymbol{\beta})$ is a standard normal density function.

4.6.1.3 Determinants of amounts of bank debt or non-bank debt

Drawing on the methodology used by Ojah and Manrique (2005), we also look at the determinants of the amounts of bank debt and non-bank debt. The reasoning here is that once a firm has decided to use a specific type of debt do the same factors that forced it to choose that kind of debt determine the amount of debt that it uses to finance additional investment? In the probit model our concern was estimating the probability of choosing a certain type of debt as a function of firm characteristics. Having chosen a given type of debt, what then determines the amount of debt that the firm holds? In order to assess this, we use the Tobit model. Statistically the Tobit model can be expressed as follows (Gujarati, 2003, Maddala, 1999 and Gouriéroux, 2000)⁹³:

$$W_i = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + \sum_{l=1}^z \alpha_l Y_{il} + \varepsilon_i, \text{ if RHS} > 0 \quad \dots\dots\dots(11)$$

$$= 0 \quad \text{otherwise}$$

Where W_i is the amount of bank debt and the other variables are as defined in the probit estimation.

Firms that do not have any bank debt must not be dropped when estimating this equation as this tends to bias the results. To estimate the Tobit equation using the whole sample and not just the censored sample we shall employ the Heckman (1976, 1979) procedure. Stage one of the Heckman procedure involves what we did when estimating the decision to use bank debt. In stage two we estimate the above Tobit equation by adding to it the inverse-Mills ratio⁹⁴. The inverse Mills ratio is derived from the probit estimate. See Appendix C of this chapter for an explanation of the Heckman procedure.

⁹³ The Tobit model was first used in a regression context by Tobin (1958). Essentially the name Tobit came from his name (Tobin's probit) since he related his study to the probit literature (Maddala, 1999).

⁹⁴ The inverse Mills ratio (also called the selection hazard) is the ratio of the probability density function, evaluated at a certain point, over the corresponding cumulative density function, also evaluated at the same point as the probability density function. The ratio is used to correct for selection bias that may result from censoring some cases of the dependent variable. In our case it is possible that a number of firms may not have made any investment during the survey period, such firms will thus not have borrowed any funds. An ordinary least squares regression would drop such firms from the sample, resulting in biased parameters. Heckman (1976)'s two-stage procedure corrects for this. Stage one involves estimating the parameters of the debt choice equation and stage two involves using the parameters estimated from stage one to calculate the inverse Mills ratio. The inverse Mills ratio is then included in the OLS estimation as an additional explanatory variable. Also see Stolzenberg and Relles (1997) for more on the use of the inverse Mills ratio.

4.4 Characteristics of firms in South Africa, Kenya, Ghana and Nigeria

4.4.1 Introduction

In the earlier section theoretical and empirical debt choice models were reviewed. It was found that firms graduate from being bank loan borrowers to being issuers of public debt as they start to access arms-length debt from public debt markets. It was also found that relationship lending tend to be common in an environment characterized by information asymmetry, ill-defined property rights and irregular enforcement of rule of law, like is common in a number of African countries. It was further suggested that firms are heterogeneous and as such tend to choose different types of debt depending especially on the firm's risk, asset base, asset structure, reputation, ownership structure, profitability and size.

This section provides a general overview of the data to be used for the estimation of the debt choice equations. The study, which utilizes data from the World Bank's firm level surveys, covers; Ghana, Kenya, Nigeria and South Africa. Zimbabwe, which was covered in the debt-equity divide section, was dropped because it was not covered in the World Bank's Investment Climate Assessment surveys.

4.4.2 Data sources and the sample of firms

For this chapter the data used came from firm-level investment climate assessment surveys conducted in Ghana, Kenya, Nigeria and South Africa. The surveys were conducted as part of the World Bank's Regional Program on Enterprise Development (RPED). The advantage of the data is that the same kind of survey instrument was used in the countries involved. This is important for comparability and benchmarking purposes.

The Kenyan firm-level survey was started in 2002 and completed in 2003. Initially it covered 386 manufacturing firms, which accounted for 20% of all formal firms in Kenya (World Bank, 2004a). But due to survey fatigue a number of firms refused to be interviewed, reducing the sample size to 282 firms (World Bank, 2004a). The sample, which included firms from Nairobi, Mombasa, Eldoret, Kisumu and Nakuru, was stratified across location, sub-sectors and size (World Bank, 2004a). See Table 4.1 for the geographic distribution of the firms. When it comes to ownership of the firms about 75%

of the firms were owned by Asians, 10% by Africans and the remainder by individuals or families of European origin. Even though the majority of the firm owners were Kenyan nationals they were largely Kenyans of South Asian descent (World Bank, 2004a). About 52% of the firms exported some of their products while 48% catered just for the local market.

Table 4.1: Geographic distribution of firms

Country	City/Province	Percentage of firms located in each province or town
South Africa	Gauteng	63
	Western Cape	23
	Kwa-Zulu Natal	19
	Eastern Cape	5
	<i>Total</i>	<i>100</i>
Ghana	Accra	59
	Kumasi	31
	Takoradi	6
	Cape Coast	4
	<i>Total</i>	<i>100</i>
Kenya	Nairobi	63
	Mombasa	15
	Nakuru	12
	Eldoret	6
	Kisumu	4
	<i>Total</i>	<i>100</i>
Nigeria	Lagos	43
	Kano	14
	Kaduna	7
	Abia	6
	Anambra	6
	Ogun	4
	River	4
	Oyo	8
	Other	8
	<i>Total</i>	<i>100</i>

Source: Own Calculations from the World Bank's Investment Climate Assessment survey and RPED surveys on Ghana, Kenya, Nigeria and South Africa.

The South African survey was conducted in 2004. A total of 603 manufacturing firms were included in the survey (World Bank, 2005a). The sample included firms from South Africa's main provinces: Gauteng, Kwa-Zulu Natal, Western Cape and Eastern Cape. The proportion of the firms surveyed is as shown in Table 4.1. A majority of the firms were owned by other firms or by European/Caucasian individuals or families. Of the total number of firms surveyed about 81% were domestically owned and 19% were foreign owned (World Bank, 2005a). Only 5% of the firms were owned by African or coloured individuals (World Bank, 2005a).

The Ghanaian survey was conducted in 2002. It covered 233 manufacturing firms. The sample included firms from Ghana's main urban areas: Accra, Kumasi, Takoradi and Cape Coast (see Table 4.1).

The survey on Nigerian firms was conducted in 2001. It consisted of 232 formal manufacturing firms that were spread in the following sectors, chemicals and paints, food and beverages, metal, non-metal, paper-printing-publishing, pharmaceuticals, plastic, textiles, and wood. It must be noted that the manufacturing sector in Nigeria is relatively small. For example in 1999 it accounted for 5.9% of the country's GDP. When it comes to location of the firms the dominance of Lagos is clear. Firms located in Lagos accounted for 43% of the total firms (see Table 4.1).

Most firms were located in the capital cities of the sample countries. For example, 63% of the firms in Kenya were located in Nairobi while in Ghana 59% of the firms were located in Accra. In South Africa, 63% of the firms surveyed were located in the Gauteng province⁹⁵. In Nigeria 43% of the firm were located in Lagos.

4.4.3 Firms Characteristics

The objective of this sub-section is to analyze the different sources of funds used by firms in the sample countries to finance new investment as well as to look at firm characteristics in general⁹⁶. A better understanding of the variables to be used in the estimation is helpful and is fairly conventional. An immediate jump to hypothesis testing alone may not be enough. Loftus (1993: 250) argues that hypothesis testing is sometimes "overstated, overused as a means of illuminating what the data in some experiment is trying to tell us". Kennedy (2003: 72) corroborates this view by arguing that significance testing must not be viewed as some sanctification of a theory:

"Sanctification via significance testing should be replaced by searches for additional evidence, both corroborating evidence, and especially, disconfirming evidence".

⁹⁵ Gauteng is considered to be South Africa's economic hub while Nairobi and Accra are the capital cities of Kenya and Ghana respectively. Lagos, Nigeria's, former capital city, is now the country's commercial city.

⁹⁶ By new investment we mean investment in machinery and equipment, excluding working capital.

This is what we do here. We analyze the data with a view to gleaning some pertinent points that one would not get from a multivariate regression, for example.

The number of firms in the sample for Ghana, Kenya, Nigeria and South Africa are 282, 233, 232 and 603, respectively. For the final regression analysis some firms were eliminated during the data cleaning exercise either because they had too many missing figures or some variables for the firms were evidently incorrect. For example firms that had negative number of employees were dropped from the sample.

The first question to ask is how did the firms in the different countries finance additional investments? The major sources of funds used by the firms are internal funds, bank debt, trade credit, family, government or donor facility and informal finance. In separate calculations not shown in the tables we checked for the popularity of the different sources of finance. We found that the most popular source is internal funds. In South Africa, Kenya, Nigeria and Ghana about 48%, 45%, 52% and 75% of the firms prefer to use internal funds, respectively. The years 1999 to 2002 were recession years in Kenya and thus the operations for a number of firms may not have been profitable enough to ensure the reinvestment of retained earnings.

In Ghana and Kenya the second most popular source of funds are bank loans. Forty percent of the firms in Kenya used bank loans to finance additional investment. In South Africa, Nigeria and Ghana 20%, 52% and 14% of the surveyed firms used bank loans, respectively. Even though the financial system in South Africa is well developed to cater for the firms in that country the percentage of the firms that actually used bank loans to finance investment is lower than expected. It must be noted that this is so even when one considers the fact that less than 20% of the firms were concerned about access to and cost of financing, 25% of the South African firms surveyed reported that they have never applied for a loan. Also 75% of those firms that never applied for a loan actually reported that they do not need the loan. Even though most firms in South Africa, like firms in most economies, prefer to use internal funds to finance their new investments, access to credit is more difficult for African-owned firms as compared to firms owned by non-Africans.

Table 4.2: Sources of Investment Finance

	Kenya	Nigeria	South Africa	Ghana
All Firms				
Retained earnings	55.57	51.08	39.18	63.70
Bank Loan	29.65	23.73	36.78	31.94
Lease	0.01	0	13.05	0.00
Donor	0.06	0	0.55	0.00
Trade credit	9.38	1	0.07	1.39
Equity	0.01	0.43	-	0.00
Family	0.17	8.98	0.01	0.15
Informal	0.00	0.60	0.02	0.01
Other	5.16	14.18	10.35	2.80
Total	100.00	100.00	100.00	100.00
Small Firms				
Retained earnings	31.85	75.75	47.35	48.52
Bank Loan	59.55	22.32	7.90	47.97
Lease	0.00	0	26.45	0.00
Donor	1.17	0	0.82	0.00
Trade credit	1.73	0.91	0.53	0.84
Equity	0.09	0.1	0.00	0.00
Family	0.82	0.46	0.00	1.53
Informal	0.00	0	0.00	0.14
Other	4.78	0.46	16.95	1.00
Total	100.00	100.00	100.00	100.00
Large Firms				
Retained earnings	59.13	67.02	38.75	65.40
Bank Loan	25.15	29.29	38.32	30.15
Lease	0.01	0	12.33	0.00
Donor	0.00	0	0.53	0.00
Trade credit	10.19	1.41	0.04	1.45
Equity	0.00	0.62	0.00	0.00
Family	0.14	0.02	0.01	0.00
Informal	0.00	0.87	0.02	0.00
Other	5.38	0.77	10.00	3.00
Total	100.00	100.00	100.00	100.00

Source: Own Calculations from the World Bank's Investment Climate Assessment survey and RPED surveys on Ghana, Kenya, Nigeria and South Africa.

Non-bank debt includes loans from friends and family members, loans from informal money lenders, trade credit, loans from parent firms and lease arrangements.

Table 4.2 shows the proportion of the different sources of funds used for new investments by country. Looking at all the firms in each country we find that retained earnings dominate as the major source of funds for new investments. It accounts for about 64%, 56%, 51% and 39% in Ghana, Kenya, Nigeria and South Africa, respectively. This shows that firms in Ghana, Nigeria and Kenya use more retained earnings than firms in South Africa. This may be due to the fact that capital markets in these countries are not as developed as those in South Africa. Hence the firms in Ghana, Nigeria and Kenya have no choice but to depend on internal funds to fund additional investments. The other reason is that external sources of funds may be hard to come by in the other African countries because of the inefficiency of the legal systems. For example, in Nigeria very few firms are willing to rely on courts to enforce contracts (Marchat *et al.*, 2002). The

implication is that surplus units would be less willing to supply funds to deficit units if they have no confidence in the judiciary.

The next major source of funds used by the firms in the four countries is bank debt (see Table 4.2). It accounted for about 30%, 24%, 37% and 32% in Kenya, Nigeria, South Africa and Ghana, respectively. The reason why this figure is lowest in Nigeria may have to do with the lack of confidence in the legal system. The proportion of trade credit in the total funds used for investment is quite low. It accounted for 9%, 1%, 0.1% and 1% in Kenya, Nigeria, South Africa and Ghana, respectively. It must be noted that the reason why trade credit seems to account for a small proportion of investment is because most firms use bank loans for investment, and trade credit to finance working capital⁹⁷. The contribution of trade credit towards new investment is hence very low. For example if one ignores the ultimate use of the funds we found that about 91% of the firms surveyed in South Africa used trade credit for either working capital or for new investments or for both. For example, South African firms used trade credit to finance about 12% of their working capital needs (World Bank, 2005a).

We categorized the firms into small and large firms. Small firms are classified as those employing less than 100 employees and large firms as those employing 100 or more employees. The objective was to see if small and large firms behave differently when it comes to raising capital. That is, does size matter when it comes to raising capital for new investments? In Kenya, South Africa, Nigeria and Ghana, retained earnings used by large firms accounted for 59%, 39%, 67% and 65%, respectively (See Table 4.2). The small firms in Kenya, South Africa, Nigeria and Ghana used retained earnings in the following proportions: 32%, 47%, 76% and 49%, respectively. For Nigeria and South Africa small firms tend to use more retained earnings than large firms. The reverse is true for Kenyan and Ghanaian firms. Large firms in Kenya and Ghana tend to use more retained earnings than small firms. This belies the general belief that larger firms tend to have more access to external funds than smaller ones and hence make heavy use of external funds as compared to the smaller firms. It can also be argued that it is also possible for large firms

⁹⁷ A number of firms also tend to roll over bank overdraft and thus use it to finance new investments.

to generate more retained earnings as compared to the smaller ones, hence the observed pattern.

Bank loans used by large firms accounted for 25%, 29%, 38% and 30% for Kenya, Nigeria, South Africa and Ghana, respectively. While that used by small firms accounted for 60%, 22%, 8% and 48% in Kenya, Nigeria, South Africa and Ghana, respectively. This means that larger firms in South Africa and Nigeria use more bank debt than smaller ones. In Kenya and Ghana the reverse is true.

Small firms in South Africa tend to use more lease to fund additional investments as compared to larger ones. The lease accounted for 26% of the total funds used by small firms in South Africa while for the large South African firms it accounted for 12% of the total funds used.

When it comes to access to government loans or to funds availed by donors we found that these funds were mostly used by small firms. In Kenya the funds from a government facility or donor funds accounted for 1% of the total funds used by small firms. No large firm used the facility to finance additional investment in Kenya. In South Africa the funds from donors or government facility accounted for 0.82% and 0.53% for small and large firms, respectively. Overall, one can conclude that more small firms tend to access government loans or funds donated by non-governmental organizations as compared to larger ones. This is not surprising since in a number of countries in Africa there are a number of facilities that are aimed at funding small to medium enterprises. Some of these may be government-initiated or initiated by non-government organizations.

The use of trade credit among large and small firms in the different countries is as follows: in Kenya trade credit accounted for about 2% and 10% of the total funds used for additional investments by small and large firms, respectively. In South Africa trade credit accounted for 0.53% and 0.04% of the total funds used by the small and large firms, respectively. In Ghana it accounted for 0.84% and 1.45% for the small and large firms, respectively. In Nigeria it accounted for 1.41% and 0.91% for large and small

firms, respectively. Most firms did not raise the funds for additional investment by issuing shares or by borrowing from informal money lenders.

Looking at the debt-equity divide of the funds used in new investments one notices that, with the exception of South Africa, firms tend to use more equity than debt when raising funds for new investments. As shown in Table 4.3, in South Africa about 61% of the funds came from debt sources while 39% came from equity sources. In Ghana 36% of the funds used to finance new investment came from debt and the remaining 64% came from equity. In Kenya, debt and equity accounted for 44% and 56%, respectively. In Nigeria debt and equity accounted for 48% and 52%, respectively.

An understanding of proportions of debt and equity used in financing new investment is important. Critically important, especially for this particular study, is the proportions of bank debt and non-bank debt in the total debt used in financing new investment⁹⁸. An analysis of the debt component of the funds reveals that 88% of the total debt used in financing new investments in Ghana came from bank debt with non-bank debt accounting for 12%. For Kenya and South Africa bank debt accounted for 67% and 59%, respectively with non-bank debt accounting for 33% and 41%, respectively. In Nigeria, bank debt and non-bank debt accounted for 76% and 24%, respectively (See Table 4.4).

Table 4.3: Sources of funds for investment by debt and equity categories (%)

Country	Debt	Equity ⁹⁹
Ghana	36	64
Nigeria	48	52
Kenya	44	56
South Africa	61	39

Source: Own Calculations from the World Bank's Investment Climate Assessment survey and RPED surveys on Ghana, Kenya, Nigeria and South Africa.

Table 4.4: Sources of funds for investment by bank and non-bank debt categories

Country	Bank Debt	Non-bank Debt	Total
Ghana	88	12	100
Nigeria	76	24	100
Kenya	67	33	100
South Africa	59	41	100

Source: Own calculations from the World Bank's RPED surveys on Ghana, Kenya, Nigeria and South Africa.

⁹⁸ Non-bank debt is any debt that was sourced from other external sources other than banks.

⁹⁹ The amount that makes up the equity amount comes from retained earnings, savings by the firm and issue of new shares. Non-bank debt includes loans from friends and family members, loans from informal money lenders, trade credit, loans from parent firms and lease arrangements.

An analysis of firm size vis-à-vis debt sources reveals that there seems to be a monotonic relationship between use of debt and size (see Table 4.5). More specifically, it seems that larger firms tend to make heavy use of both bank debt and non-bank debt as compared to smaller ones. For example, in South Africa bank debt used by larger firms accounted for about 58% of the total funds used by both small and large firms. Bank debt used by smaller firms accounted for 1%. In the case of Ghana, the amount of bank debt used by larger firms accounted for 75% while the smaller firms' accounted for 13% of the total amount of debt used to finance new investment. In Kenya, bank debt accounted for 59% and 8% for large and small firms, respectively. For Nigeria, this pattern is maintained: bank debt accounted for 73% and 3% of the total debt used for new investments by large and small firms, respectively.

Table 4.5: Distribution of bank debt and non-bank debt by firm size

	Kenya	Nigeria	Ghana	South Africa
All Firms				
Bank debt	67	76	88	59
Non-bank debt	33	24	12	41
Total	100	100	100	100
Small Firms				
Bank debt	8	3	13	1
Non-bank debt	1	1	1	4
Large Firms				
Bank debt	59	73	75	58
Non-bank debt	32	23	11	37
Total	100	100	100	100

Source: Own calculations from the World Bank's RPED surveys on Ghana, Kenya, Nigeria and South Africa.

Table 4.6 shows the summary statistics of firms surveyed. The minimum number of people employed by South Africa is 2 and the maximum is 18 753. The mean size is 329 employees. The minimum sales growth rate is -1% and the maximum is 133%. The minimum, maximum and mean age of South African firms are 0, 110 and 24 years, respectively. The other variables are discontinuous variables taking values of 0 and 1. For the Kenyan firms the sales growth rate ranges from -1% to 105.7%. The mean sales growth rate for the Kenyan firms is about 6%. For the Ghanaian firms the minimum and maximum ages of the firms are 8 and 72, respectively. This is comparable to Nigerian firms whose age ranges from 1 to 78 years.

Table 4.6: Summary Statistics

Country	Variable	Mean	Std. Dev	Min	Max
Kenya	Bank debt	0.26	0.44	0	1
	Non-bank debt	0.14	0.35	0	1
	Age	26.37	19.96	0	108
	Size	227.97	456.63	4	5064
	Sales growth	6.05	75.62	-1	105.70
	Indebtedness	0.24	0.39	0	1
	Export	1.47	0.50	0	1
	Location	0.62	0.49	0	1
	Education	0.62	0.49	0	1
	Listed	0.06	0.23	0	1
	Asset tangibility	0.33	0.35	0	1
	Audited	0.97	0.16	0	1
Ghana	Bank debt	0.06	0.24	0	1
	Non-bank debt	0.02	0.32	0	1
	Age	24.14	11.75	8	72
	Size	69.33	156.03	2	1351
	Sales growth	1.32	5.37	-5.58	45.78
	Indebtedness	0.46	0.50	0	1
	Export	0.19	0.40	0	1
	Location	0.49	0.50	0	1
Nigeria	Bank debt	0.284	0.45	0	1
	Non-bank debt	0.043	0.20	0	1
	Age	20.086	13.89	1	78
	Size	316.08	687.12	5	6000
	Sales growth	16.97	2.19	-1	11.15
	Indebtedness	0.23	0.38	0	1
	Export	0.142	0.502	0	1
	Location	0.427	0.496	0	1
	Education	0.323	0.469	0	1
	Listed	0.155	0.363	0	1
	Asset tangibility	0.63	0.30	0	1
	Audited	0.879	0.326	0	1
South Africa	Bank debt	0.27	0.45	0	1
	Non-bank debt	0.31	0.46	0	1
	Age	24.47	22.86	0	110
	Size	329.33	1082.92	2	18753
	Sales growth	7.29	92.28	-1	133.23
	Indebtedness	0.31	0.42	0	1
	Export	0.58	0.50	0	1
	Location	0.62	0.49	0	1
	Education	0.69	0.46	0	1
	Listed	0.04	0.20	0	1
	Asset tangibility	0.43	0.26	0	1
	Audited	0.97	0.17	0	1

Source: Own calculations from the Investment Climate Assessment surveys on Ghana, Kenya, Nigeria and South Africa.

Size is equal to the number of employees, age is the number of year since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and zero if the firm is located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise.

The minimum and maximum numbers of employees for firms in Ghana are 2 and 1351. This is lower than the minimum and maximum sizes in Kenya which are 4 and 5064, respectively. The minimum and maximum sales growth rates for the Ghanaian firms are -5.58% and 45.78%, respectively. A few other pertinent summary statistics are provided

in Table 4.6, while relationships between them are shown in Tables A4.1 to A4.4 in the appendix of this chapter.

4.4.3.1 Difference-in-means across firm sizes and debt use

Table 4.7: Debt types difference-in-mean tests by country and firm size

Group	Leverage ¹⁰⁰			
	Nigeria	South Africa	Ghana	Kenya
Firms with bank debt	0.202	0.63	0.205	0.211
Firms with non bank debt	0.037	0.61	0.054	0.152
t-statistic	(6.15)***	(1.03)	(3.24)***	(1.26)
Large firms ¹⁰¹	0.322	0.294	0.251	0.275
Small firms	0.124	0.318	0.136	0.204
t-statistic	(5.43)***	(1.25)	(4.29)***	(1.87)*

* Significance level at 10%, ** significance level at 5%, *** significance level at 1%

We conducted mean-difference tests to assess differences in means among firms with bank debt and those without bank debt as well as the differences in means between small and large firms. Results of these analyses are presented in Table 4.7. Nigerian firms with bank debt had mean leverage of 0.202 while firms without bank debt had mean leverage of 0.037. The means of the two groups of firms differ significantly at 1% level of significance as evidenced by a t-statistic of 6.15. The mean leverage for firms with bank debt is five times higher than that of firms without bank debt. For South Africa, firms with bank debt and those without had mean leverages of 0.63 and 0.61, respectively. There is no statistical difference in the means between the two groups of firms. For Ghanaian firms, the means are 0.205 and 0.05 for firms with bank debt and those with non-bank debt, respectively. The means of the two groups of firms differ significantly at 1% level of significance as evidenced by a t-value of 3.24 and the fact that the mean leverage for firms with bank debt is more than 3 times that of firms with non-bank debt. For Kenyan firms, the means for firms with bank debt is 0.211 while that of firms without is 0.152. Generally, for all countries, firms with bank debt are highly leveraged as compared to those without bank debt. This is consistent with the notion that firms with bank debt have higher leverage because leverage-related costs resulting from information asymmetry are lower under bank contracts (Johnson, 1998).

¹⁰⁰ Leverage is equal to total new debt used in financing new investment divided by total new investment.

¹⁰¹ Large firms are firms that employ greater than 100 employees while small firms are firms that employ 100 or less employees.

When it comes to the mean difference of the overall leverage across firms of different sizes we found that the means of larger firms are generally higher than those of small firms, especially for Nigeria, Ghana and Kenya. This may be due to the fact that such firms can easily access debt than small firms.

4.4.4 Empirical Results for the Debt Choice Decision

4.4.4.1 Debt Choice Results on South Africa

Table 4.8a shows the debt choice results on South African firms. The table shows that age, sales growth, listed, location and ethnicity are negatively related to bank debt choice while size, exports, indebtedness, education and asset tangibility are positively related to bank debt choice. Asset tangibility has the expected sign in the bank debt choice model. Its coefficient is positive and is significantly different from zero at the 5% level. More specifically, as per the marginal effects table, a 1% increase in asset tangibility increases the probability that the firms will choose bank debt by 0.36%. This suggests that firms with more collateral tend to prefer bank debt as compared to those with less collateral. This result corroborates findings by Johnson (1997) who found a positive relationship between fixed assets ratio and bank debt choice. Given the important role of banks in funding firms, especially in economies where the public debt markets are not well developed, one would expect to see relationship lending dominating a number of debt contracts between banks and firms. In that case the use of assets as collateral would diminish. In our case this seems not to be the case. This result supports hypothesis 5 which states that asset tangibility is positively related to bank debt. In the non-bank debt model, the sign of the asset tangibility coefficient is negative and significant at the 1% level. This may imply that bank debt and non-bank debt are considered to be substitutes by the firms. That is, firms with high asset tangibility tend to prefer more bank debt and less non-bank debt.

Size matters. Size measures the firm's visibility in the market. The degree of information asymmetry is less severe for larger firms as compared to smaller firms. Thus size can be used as a proxy for information availability. Ideally, larger firms must have the luxury of choosing a favourable source of debt. According to Fama (1985), larger firms can cheaply produce information required to issue public debt. They thus tend to borrow from

arms-length debt markets than from banks. Recall, a number of theoretical models argue that public debt is cheaper than bank debt¹⁰². A bigger firm must be in a better position to offer collateral and can easily access loans both from banks as well as from public-debt markets. But in most African countries most firms cannot access public debt funds because the public debt markets are still in their embryonic stages of development. Hence the firms tend to rely on bank debt. Thus one would expect the sign of the size coefficient to be positive. In our results the size coefficient is positive in both the bank debt choice and non-bank debt choice models¹⁰³. This result confirms hypothesis 3, that firm size is positively related to bank debt. The size coefficient is significantly different from zero in the bank debt choice model but not significant in the non-bank debt model. This result supports findings by Alonso *et al.*, (2005) and Ojah and Manrique (2005) but contradicts findings by Denise and Mihov (2003), Houston and James (1996) and Johnson (1997), who found a negative relationship between bank debt and size. As shown in the marginal effects table, an increase in size by 1% increases the probability of the firm choosing bank debt by 0.15% and that of choosing non-bank debt by 0.036%.

Recall that age can also be used as a proxy for reputation. As a firm grows older it gradually acquires reputation which it can use to access loans from either the private debt sources or from the public debt sources. According to Diamond (1989, 1991), as a firm garners sufficient reputation its preference for bank loans may start to decline. So the relationship between bank debt choice and reputation is not monotonic. This is especially so in developed economies where public debt markets are well developed. In less developed economies, public debt markets are either non-existent or in their embryonic stages of development. As a result firms in less developed countries tend to prefer to use more bank debt as they acquire more reputation. The coefficient of the age variable in

¹⁰² Even though public debt is cheaper than bank debt, firms still use bank debt even when public debt is available to them. One of the reasons is that such firms may value renegotiability which comes with bank debt but difficult with public debt, since bank debt can be easily rolled over. They may also require monitoring, which can be efficiently done by banks. Monitoring may be necessary during the growth stages of the life cycle of the firm as it accumulates the requisite reputation which it may then use to enter the public debt markets. It must also be noted that firms may decide not use bank debt even when it is available if the benefits that come with renegotiability and monitoring are outweighed by the cost of inflexibility or hold-up problem associated with bank debt.

¹⁰³ Large firms have more bargaining power than smaller ones. They can use it to their advantage in their relationships with banks, such that as they grow, they may actually prefer bank debt even when they are in a position to access public debt.

both models is negative but not significant, implying that age per se may not be the best proxy for reputation. Indeed, size can play an important reputational role. This may be so in the case of firms in Africa. The negative sign of the age coefficient is however supported by the finding by Johnson (1997). Alternatively, one can view age to proxy ability to raise more internal funds and thus less need for external funds. Not only is the internal funds proxy in this model – sales growth – of the correct sign, but the capital structure analysis in Chapter 3 of this study also confirms that most SSA countries' firms follow the pecking order theory.

The sales growth variable was used to proxy profitability. One would expect that a firm with high sales growth would, *ceteris paribus*, increase its profits and thus retained earnings. Given that a number of firms tend to use internal funds before resorting to external sources one would expect a negative relationship between sales growth and bank debt choice. As shown in Table 4.8a the sign of the sales growth coefficient is negative and significant at 1% level of significance in both models of debt choice, thus confirming hypothesis 1. This result is consistent with the pecking order theory which states that firms prefer internal to external funds (Meyers and Majluf, 1984). In the marginal effects table we can see that an increase in the growth rate of sales reduces the probability of choosing bank debt and non-bank debt by 0.21% and 0.001%, respectively.

One of the major contributions of this study is the inclusion of some factors that are germane to African firms and countries. The heterodox variables that we included are exports, education of owner or senior manager and ethnicity of principal owners. There are no theoretical predictions on these factors. We however expected a positive relationship between exports and bank debt choice. This is because we use the exports variable as a dummy for diversification. Basically, we hypothesize that a firm that exports is more diversified than a firm that does not. A firm that exports can easily withstand internal shocks as compared to that which caters for the local market only. As a result such a firm can easily access bank debt since banks consider the firm to be less risky. The export variable is positively related to bank debt choice but negatively related

to non-bank debt choice. The export coefficient is however not significant at conventional levels in both debt choice models.

Ethnicity dummies were also included. The ethnicity dummy was constructed such that it takes a value of one if the majority owner of the firm is African and zero otherwise. Ethnicity is negatively related to bank debt choice but positively related to non-bank debt choice. This implies that African-owned firms are likely to choose non-bank debt and not bank debt when they raise debt funds for investment. The coefficient is however insignificant in both models. The implication is that, according to the data and the way we measured ethnicity, ethnicity does not seem to play a role in debt choice.

The next issue to be addressed is whether location matters in the preference for debt sources. The coefficient of the location variable is negative in the bank debt model but positive in the non-bank debt model. This implies that firms located in Gauteng prefer less bank debt than those located in other provinces. The results also show that firms located in Gauteng prefer more non-bank debt than those in other provinces. In both models (the bank and non-bank debt models) the coefficient is significant at 10% and 1% levels of significance, respectively. The other heterodox variable used is education. It is positively related to both bank debt and non-bank debt choice even though it is insignificant in both models.

We also tested whether the extent to which the firm is indebted plays a role in debt choice. We found that indeed it does. We found that more indebted firms tend to prefer more bank debt and non-bank debt. The variable is significant at 1% level of significance for both models. This supports the findings by Johnson (1998) and Hooks (2003). It appears that earning a seal of approval of the delegated monitoring expertise of a bank, earns a firm a relative carte-blanc to access almost all other debt sources.

Table 4.8a: Regressions of determinants of South African firms' preference for bank and non-bank debt

Explanatory variable	Bank debt	Non-bank debt
Intercept	-1.529 (-2.96)***	-0.248 (-0.37)
Size	0.422 (2.11)**	0.110 (0.45)
Age	-0.273 (-1.29)	-0.170 (-0.78)
Export	0.214 (1.12)	-0.285 (-1.43)
Salesgrowth	-0.569 (-2.92)***	-0.002 (-3.98)***
Indebtedness	1.021 (4.90)***	1.831 (7.83)***
Location	-0.324 (-1.73)*	0.680 (3.00)***
Listed	-0.793 (-1.19)	-0.237 (-0.350)
Education	0.180 (0.94)	0.020 (0.10)
Ethnicity	-0.146 (-0.39)	0.548 (1.15)
Asset tangibility	0.994 (2.54)**	-0.951 (-2.15)**
Number of observations	258	254
Percentage correctly predicted	67.44	79.53
R-squared	0.12	0.27
Prob>chi2	0.0003	0.000
Log-Likelihood	-148.06	-116.11
Wald chi2(10)	34.95	115.33

t-statistics are in parentheses; *, **, *** show the levels of significance at 10%, 5% and 1%, respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise.

Table 4.8b: Marginal effects for South African firms

Variable	Model of determinants of bank debt choice	Model of determinants of non-bank debt choice
Size	0.154**	0.036
Age	-0.010	-0.056
Export	0.362	-0.095
Salesgrowth	-0.207***	-0.001***
Indebtedness	0.372***	0.605***
Location	-0.124*	0.210***
Listed	-0.223	-0.072
Education	0.063	0.007
Ethnicity	-0.051	0.202
Asset tangibility	0.362**	-0.314**

t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1%, respectively.

The two models passed the chi-squared test (see Table 4.8a) . The R-squared for the bank debt model is 12% while that for the non-bank debt model is 27%. Another important measure of goodness of fit that is important for discrete response models is the percent

correctly predicted (Wooldridge, 2002). In the bank debt choice equation, for each firm i we computed the predicted probability that the firm had bank debt (*let us call this $w_i = 1$*), given the other variables. If the predicted probability is above 0.5 we predict w_i to be unity. If the predicted probability is less than 0.5 we predict w_i to be zero. The percentage of times that the predicted w_i matches the actual w_i is the percent correctly predicted. In terms of this measure the models do quite well. For the bank debt and non-bank debt choice models the percent correctly predicted are 67% and 80%, respectively.

4.4.4.2 Determinants of bank debt and non-bank debt amounts: Results for South Africa

In the above section we looked at firms' debt preferences. In this section we investigate whether the firms manage to get the type of debt they prefer. We therefore look at the determinants of the amounts of bank debt and non-bank debt used in financing new investments. Table 4.9 shows the estimated results for the determinants of the amounts of both bank debt and non-bank debt. The results show that size matters when it comes to accessing bank and non-bank loans. The sign of the coefficient of the size variable is positive and significant at the 1% level of significance for the bank debt amount model, supporting the findings by Ojah and Manrique (2005) and Hooks (2003). In the non-bank debt model the coefficient of size is also positive and significant at 10% level of significance. This implies that bigger firms manage to get both forms of debt as compared to smaller ones. This seems to confirm the hypothesis that bank debt and non-bank debt may not necessarily be substitutes. Firms may actually use them as complements rather than as substitutes, the hold-up problem and rent extraction by banks notwithstanding.

From the debt choice section we argued that sales growth may imply an increase in retained earnings hence we expected that there would be a negative relationship between debt and sales growth as firms would be utilizing internal funds to finance their investments. Sales growth can also proxy for firm growth. In this case a growing firm may actually need more external funds, and lenders will view this profitability trend as an indication of ability to service its debt and thus provide the credit. Sales growth and both forms of debt are positively related, implying that fast growing firms may require and

access more debt as compared to slow-growing ones. The sales growth coefficient is however insignificant in both models. Age, education and listed were found to be positively, but insignificantly, related to both bank and non-bank debt amounts. This implies listed firms that are older and are managed by a manager with a university degree are highly leveraged as compared to those that are unlisted, younger and managed by someone without a university degree.

The results also show that firms that are highly indebted in the new investments tend to secure more bank debt. The coefficient of the indebtedness variable is significantly different from zero at 5% level. Looking at the determinants of bank debt choice and the amount of bank debt we can conclude that for South Africa, bigger firms that prefer bank debt manage to get the debt that they prefer. Those larger firms that prefer non-bank debt also manage to get that kind of debt. Basically, size seems to matter when it comes to choice and access to finance.

Table 4.9: Regressions of determinants of debt amounts for South African firms

Explanatory variable	Bank debt amount	Non-bank debt amount¹⁰⁴
Intercept	0.744 (0.45)	6.023 (7.28)***
Size	0.833 (3.78)***	0.538 (1.91)*
Age	0.473 (1.44)	0.100 (0.31)
Export	-0.233 (-0.70)	0.213 (0.65)
Salesgrowth	0.381 (1.12)	0.165 (0.65)
Indebtedness	1.894 (2.38)**	-0.771 (-1.57)
Location	0.479 (0.93)	-0.368 (-1.24)
Listed	0.827 (1.41)	0.579 (0.61)
Education	0.348 (1.59)	0.274 (0.98)
Ethnicity	-1.011 (-1.96)**	0.439 (0.89)
Asset tangibility	0.560 (1.29)	0.504 (0.78)
Number of observations	307	480
Prob>chi2	0.000	0.37
Log-likelihood	-185.26	-192.42

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

¹⁰⁴ Heckman procedure is used to estimate this equation.

4.4.4.3 Debt Choice Results on Kenya

Table 4.10a: Regressions of determinants of Kenyan firms' preference for bank debt and non-bank debt

Explanatory variable	Bank debt	Non-bank debt
Intercept	-1.225 (-1.77)*	0.724 (0.55)
Size	0.474 (2.61)***	0.341 (1.49)
Age	0.210 (0.74)	-0.014 (-0.05)
Export	-0.277 (-1.30)	-0.629 (-2.36)**
Salesgrowth	-0.003 (-2.05)**	-0.003 (-1.18)
Indebtedness	-0.128 (-0.52)	-0.065 (-0.23)
Location	0.216 (1.01)	-0.309 (-1.28)
Listed	-0.283 (-0.59)	0.176 (0.36)
Education	-0.392 (-1.84)*	-0.446 (-1.76)*
Ethnicity	-0.208 (-0.63)	-0.584 (-1.18)
Number of observations	191	191
Percentage correctly predicted	71.20	84.29
R-squared	0.10	0.10
Prob>chi2	0.02	0.05
Log-Likelihood	-106.70	-71.66
Wald chi2(18)	19.30	19.81

Table 4.10b: Marginal effects for Kenyan firms

Variable	Model of determinants of bank debt choice	Model of determinants of non-bank debt choice
Size	0.156***	0.068
Age	0.069	-0.003
Export	-0.091	-0.125**
Salesgrowth	-0.001**	-0.001
Indebtedness	-0.042	-0.013
Location	0.070	-0.064
Listed	-0.085	0.038
Education	-0.132*	-0.095*
Ethnicity	-0.065	-0.088

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

Table 4.10a shows debt choice results on Kenya. The main determinants of debt preference in Kenya are size, exports, profitability and education. Ethnicity, age, indebtedness, location and listed were insignificant in both models.

Size is positively related to bank debt preference. This means that an increase in size increases the preference for bank debt. More specifically, a 1% increase in size increases the probability of choosing bank debt by about 0.16% (see Table 4.10b). The coefficient of the size variable is significant at the 1% level of significance in the bank debt model. This result confirms our hypothesis that bank debt preference and size are positively related. The coefficient is equally positive, but insignificant, in the non-bank debt model.

As explained earlier, the export variable is used as a proxy for diversification. There is a negative relationship between exports and both bank debt and non-bank debt. The results suggest that firms that export tend to prefer less bank debt than those that do not export. The export coefficient is significant at the 5% level in the non-bank debt model but insignificant in the bank debt model.

In our earlier discussion, it was suggested that sales growth can be seen as proxying growth or profitability of the firm. In the case where it proxies firm growth, one can argue that fast growing firms are likely to require more external funds as compared to slow growing ones. In the case where it proxies profitability one can argue that a more profitable firm's appetite for external funds would be lower than that of less profitable ones, as per the pecking order theory. This would imply that a more profitable firm would be less likely to use external funds. Since in the context of African countries, bank debt is the major source of external funds, one would expect more profitable firms to prefer less debt as compared to less profitable ones. Alternatively, if one is using sales growth as a proxy for growth, then one would expect firms to prefer more debt. In the case of Kenya, we find a negative relationship between sales growth and both bank debt and non-bank debt. That is, an increase in profitability reduces the likelihood of the firm choosing bank debt.

Education is negatively related to both bank debt and non-bank debt. This implies that a firm whose manager has a higher level of education (a university degree or better) prefers less bank debt as compared to ones managed by less educated individuals. The education coefficient is significant at the 10% level in both models.

4.4.4.4 Determinants of bank debt and non-bank debt amounts: Results for Kenya

Given the debt source preferences as indicated in the preceding section, we now look at the firm characteristics that determine the amount of debt that the firms get after having selected a given debt source. The amount of bank debt used by firms in Kenya to finance new investments seems to be determined mainly by size, age, education, indebtedness and ethnicity (see Table 4.11). Size is positively related to both bank debt and non-bank debt amounts used to finance new investments. The coefficient of the size variable is significant at the 1% level of significance in both models, implying that larger Kenyan firms can easily access both forms of debt as compared to smaller ones. This corroborates the findings of a World Bank (2004a) report on Kenya which found that size is an important factor in accessing loans. The report further states that whatever problem faced by firms in any of the African countries the problem is likely to be severe for smaller firms.

Reputation plays an important role in African contracts where trust among economic agents is of paramount importance. For Kenyan firms, age is negatively related to both forms of debt, implying that older firms may be on the favourable end of Diamond's reputational spectrum such that they tend to access other cheaper sources of debt that do not require close monitoring that bank loans entail. The firm may also be avoiding the hold-up and rent extraction problems associated with bank loans. The coefficient of age is significant in both models. According to the results, highly indebted firms seem to be using more non-bank debt and less bank debt. The indebtedness coefficient is however significant in the non-bank debt model only.

Recall that we included in our models some African-specific heterodox variables: education of manager, location, whether the firm is listed or not and ethnicity. Location and listed were not significant in both models, suggesting that when it comes to access to debt these factors are probably not as important. Education is positively related to both bank and non-bank debt amounts, suggesting that firms managed by more educated managers tend to get more bank debt than those managed by less educated managers. The education coefficient is significant in both models; at the 10% level in the bank debt

model and at the 1% level in the non-bank debt model. We found ethnicity to be more important in the non-bank debt model, where its coefficient is positive and is significant at the 10% level. This implies that firms whose majority owner is an African tended to easily access non-bank debt than bank debt. Ethnicity is not important when it comes to the determination of bank debt amount, according to the results.

When it comes to whether the sectors in which the firms operate do affect the amounts of bank debt and non-bank debt, we found that the firms in the chemicals sector have more bank debt than those in agriculture. We used agriculture as the benchmark sector. In the non-bank debt model we found that firms in the bakery, printing, chemicals and garments sectors tend to use less non-bank debt as compared to those in the agricultural sector. (See Table B4.0 in the appendix for these results).

Table 4.11: Regressions of determinants of debt amounts for Kenyan firms

Explanatory variable	Bank debt	Non-bank debt
Intercept	9.923 (2.95)***	7.712 (2.12)**
Size	3.016 (6.20)***	2.536 (3.73)***
Age	-2.007 (-2.81)***	-2.094 (-1.77)*
Export	0.334 (0.76)	-0.118 (-0.12)
Salesgrowth	-0.041 (0.34)	-0.283 (-1.36)
Indebtedness	-0.100 (-0.17)	4.636 (1.83)*
Location	-0.135 (-0.32)	0.410 (0.53)
Listed	1.028 (1.22)	-0.310 (-0.24)
Education	1.012 (1.89)*	2.156 (2.98)***
Ethnicity	-0.158 (-0.19)	3.341 (1.92)*
Number of observations	194	194
Prob>chi2	0.000	0.0001
Wald chi2	53.17	35.78
Log-likelihood	-213.05	-115.11

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

4.4.4.5 Debt choice results for Ghana

Table 4.12a: Regressions of determinants of Ghanaian firms' preference for bank debt and non-bank debt

Explanatory variable	Bank debt	Non-bank debt
Intercept	-5.540 (-2.22)**	-2.89 (-1.75)
Size	0.357 (1.20)	0.061 (0.29)
Age	0.334 (0.50)	0.205 (0.40)
Export	2.050 (1.64)*	1.066 (2.00)**
Salesgrowth	-0.026 (-0.45)	-0.032 (-0.51)
Indebtedness	0.032 (1.96)*	
Location	0.077 (0.11)	0.136 (0.29)
Number of observations	116	113
Percentage correctly predicted	94.83	94.69
Wald chi2(5)		13.48
Wald chi2(6)	21.66	
R-squared	0.46	0.16
Log-likelihood	-12.79	-19.78
Prob>chi2	0.0014	0.019

Table 4.12b: Marginal effects for Ghanaian firms

Variable	Model of determinants of bank debt choice	Model of determinants of non-bank debt choice
Size	0.002	0.005
Age	0.002	0.015
Export	0.105*	0.145
Salesgrowth	-0.0001	-0.002
Indebtedness	0.0002*	-
Location	0.0004	0.010

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively. Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

For Ghanaian firms we find that size is positively related to both bank debt and non-bank debt preferences, suggesting that bigger firms tend to view the two sources as complements such that they prefer to use both to finance additional investment (see Table 4.12a). The coefficients of the size variable are however insignificant in both models. Sales growth's coefficients also had the correct signs in both equations but they were insignificant in both models. Similarly, age is positively related to both bank debt and non-bank debt choice but both coefficients are also not significant. Firms that were

located in the capital city Accra tended to prefer more debt as compared to those located in other cities.

In our earlier discussion it was argued that firms that export can withstand localized shocks as compared to those that do not export. Such firms are therefore more likely to be able to honour their debt obligations when it falls due as compared to firms that cater just for the local market. That is, firms that export have lower risk profiles as compared to those that do not export. The export coefficients in the two models were positive and significant. Another important factor in the determination of debt choice in Ghana is the extent to which a firm is indebted. The indebtedness coefficient is positively related to bank debt choice, implying that highly indebted firms tend to prefer more bank debt as compared to those that are less indebted. The indebtedness variable was dropped in the non-bank debt equation because it was highly collinear with the other independent variables.

Firms that are more profitable have internal resources at their disposal, which they can use to finance additional investment. Recall that we used sales as a proxy for profitability. In the case of Ghana we find that more profitable firms tend to prefer less debt as compared to less profitable ones. The coefficients of the profitability variable in both models are however insignificant.

Table 4.12b shows the marginal effects. It shows that a 1% increase in size of the firm increases the probability that the firm will choose bank and non-bank debt by 0.002% and 0.005%, respectively. A 1% increase in age increases the probability that a firm will choose bank and non-bank debt by 0.002 and 0.015%, respectively. Increasing profitability by 1% reduces the probability of choosing bank debt and non-bank debt by 0.0001% and 0.002%, respectively.

4.4.4.6 Determinants of bank and non-bank debt the amounts for Ghana

First, note that the OLS regression was used to estimate the models for Ghana because the likelihood function using the Heckman procedure was not concave. The results in Table 4.13 must therefore be interpreted with caution as the estimated parameters may be

biased because of the many observations that were censored because the firms concerned either did not invest or if they did they did not use any debt at all. The variables whose coefficients are significantly different from zero are size and sales growth. Size is positively related to both bank debt and non-bank implying that larger firms have access to more bank debt and non-bank debt as compared to smaller ones. The reason why larger firms can easily access more debt as compared to the smaller ones is that larger firms are more visible in debt markets such that potential lenders have more information concerning them. That is, information asymmetry appears to be relatively lower for larger firms. The other reason is that larger firms tend to have more assets to pledge as collateral such that lenders can easily lend to them. The fact that the severity of debt access problems are higher for smaller firms than for larger firms also corroborates the findings by the World Bank (2004a) who found the same result for South Africa and Kenya.

Table 4.13: Regressions of determinants of debt amounts for Ghanaian firms

Explanatory variable	Bank debt amount	Non-bank debt amount
Intercept	-0.062 (-1.09)	-15.973 (-0.9)
Size	0.002 (8.39)***	0.711 (12.5)**
Age	-0.001 (-0.45)	-0.646 (-0.99)
Export	0.059 (0.88)	-33.585 (-1.61)
Salesgrowth	-0.016 (-3.19)***	-7.061 (-4.5)***
Indebtedness	-0.0001 (-0.01)	0.022 (0.04)
Location	0.067 (1.37)	17.002 (1.11)
Number of observations	116	116
R-squared	0.43	0.59
Prob>F	0.0000	0.0002
F(6, 109)	15.72	28.96

t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

Sales growth has the expected sign. It is negatively related to both bank debt and non-bank debt. This implies that more profitable firms tend to use internal funds rather than debt when financing new investments. Recall that the same results were found for Kenyan firms.

4.4.4.5 Debt choice results for Nigeria

Table 4.14a: Regressions of determinants of Nigerian firms' preference for bank and non-bank debt

Explanatory variable	Bank debt	Non-bank debt
Intercept	-5.277 (-2.17)**	-1.608 (-0.52)
Size	0.436 (1.36)	0.244 (1.06)
Age	0.507 (1.77)*	-0.631 (-2.71)***
Export	0.020 (0.09)	
Salesgrowth	-0.094 (-0.63)	0.019 (0.11)
Listed	-0.910 (-1.54)	0.752 (1.11)
Ethnicity	0.895 (1.84)*	-0.578 (-1.35)
Indebtedness	5.730 (6.47)***	1.790 (3.90)***
Location	-0.058 (-0.15)	-0.187 (-0.30)
Education	-0.446 (-0.97)	1.077 (1.61)
Assettangibility	1.256 (1.85)*	-1.850 (-2.37)**
Number of observations	141	125
Wald chi2(10)	58.01***	23.23**
R-squared	0.71	0.38
Percentage correctly predicted	94.33	94.40
Log-likelihood	-30.62	-16.63

Table 4.14b: Marginal effects for Nigeria

Variable	Model of determinants of bank debt choice	Model of determinants of non-bank debt choice
Age	0.131*	-0.009***
Size	0.112	0.004
Salesgrowth	-0.024	0.002
Location	-0.015	-0.003
Listed	-0.168	0.025
Education	-0.106	0.033
Ethnicity	0.202*	-0.011
Indebtedness	1.484***	0.026***
Export	0.005	
Assettangibility	0.325**	-0.027**

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

Table 4.14a shows the results on Nigerian firms' debt choice. In Nigeria, age is positively related to bank debt choice but negatively related to non-bank debt. Specifically, a 1% increase in age increases the probability of choosing bank debt by 0.13% and reduces the probability of choosing non-bank debt by 0.009% (see Tables 4.14a and 4.14b). The coefficient of age is significant at the 10% level in the bank debt model, implying that an increase in age increases the probability that a firm will choose bank debt. The reverse is true for the non-bank debt model, where an increase in age reduces the preference for non-bank debt. In Nigeria, it may be that large firms have acquired enough reputation to borrow from banks, which are the major, if not the only formal lenders there.

When it comes to the role of ethnicity in Nigeria, we found that African-owned firms tend to prefer more bank debt as compared to firms owned by non-Africans. The ethnicity parameter is significantly different from zero at the 10% level of significance. Indebtedness is positively related to the preference of both bank debt and non-bank debt. The parameters are significant at the 1% level which implies that highly indebted firms tend to prefer more debt than the less indebted ones. More specifically, a 1% increase in indebtedness increases the probability of choosing bank and non-bank debt by 1.5% and 0.03%, respectively. This confirms the results found for South African, Ghanaian and Kenyan firms (for the non-bank debt equation).

Asset tangibility is positively related to bank debt choice but negatively related to non-bank debt preference. The parameter in the bank debt choice model is significant at 10% level of significance while that in the non-bank debt is significant at the 5% level. This result implies that firms with higher fixed assets tend to prefer more bank debt because such firms know that if the lenders require collateral they can pledge the fixed assets. From the marginal effects table, we see that a 1% increase in asset tangibility increases the probability of choosing bank debt by 0.352%. The asset tangibility coefficient in the non-bank debt model is however negative and significant at 10% level. This implies that firms with high fixed assets tend to prefer less non-bank debt. More specifically a 1% increase in asset tangibility reduces the probability of choosing non-bank debt by 0.027%. This suggests that the firms consider bank debt and non-bank debt as substitutes.

As can be seen from Table 4.14a, the models are quite significant. The R-squared for bank debt choice models is 71% while that for the non-bank model is 38%. The percentage correctly predicted is about 94% for both models. Both models were significant at 1% level of significance.

4.4.4.6 Determinants of bank debt and non-bank debt amounts for Nigeria

Table 4.15: Regressions of determinants of debt amounts for Nigerian firms

Explanatory variable	Bank debt (amount)	Non Bank debt (amount)
Intercept	4.760 (1.74)*	1.199 (0.40)
Size	0.004 (1.57)	0.002 (0.61)
Age	-0.006 (-0.35)	-0.031 (-1.26)
Salesgrowth	0.638 (4.74)***	0.018 (0.11)
Export	-0.069 (-0.14)	-0.766 (-1.37)
Education	-0.403 (-0.89)	0.279 (0.43)
Location	0.298 (0.69)	0.088 (-0.13)
Listed	-0.259 (-0.43)	1.002 (1.05)
Ethnicity	-0.146 (-0.32)	-0.485 (-0.70)
Indebtedness	0.747 (0.97)	2.538 (3.04)***
Assettangibility	0.262 (0.41)	-0.983 (-1.09)
Number of observations	186	143
Prob > chi2	0.0000	0.06
Log-likelihood	-276.58	-373.26
Wald chi2(11)	40.47	17.95

t-statistics are in parentheses and *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

The only variables that are significant in the debt amounts equations are sales growth and indebtedness. The other variables such as size, age, ethnicity and asset tangibility have the correct signs but they are statistically insignificant. Sales growth is positively related to bank debt amount. This belies the expected negative relationship between bank debt and profitability, as per the pecking order theory. This result is however consistent with the capital structure result in Chapter 3, where Nigerian firms were shown not to follow

the pecking-order theory. We then conjectured that it appears Nigerian firms need additional external funds via debt contracts even when they are profitable. Their earnings are likely distributed to equity holders, who provide the major part of their total funding.

Indebtedness is positively and significantly related to non-bank debt implying that highly indebted firms tend to prefer non-bank debt. The other variables like size, age, location and asset tangibility have the correct signs but they are not significant. The size coefficient is positive and marginally significant in the bank debt model.

4.7 Conclusion

Debt choice in an African environment, an environment characterized by information asymmetry, shallow and illiquid debt markets (where they exist), is investigated. Given that African debt markets are essentially bereft of public debt markets we suspected heavy use of bank debt. This turned out to be true since, on average, about 70% of the total incremental debt used by the firms in the countries looked at came from banks as loans. This confirms one of our hypotheses that bank debt dominates other sources of debt. The use of bank debt is also increasing with size: we found that larger firms tend to use more bank debt as compared to smaller ones. This confirms Hooks (2003) and Diamond's (1991) argument that very small firms are at the wrong side of the reputation spectrum and thus fail to get bank loans. Larger firms that prefer bank debt also tend to get it as compared to smaller ones. This confirms the hypothesis that larger firms have acquired the requisite reputation which would have given them access to cheaper arms-length debt if public debt markets were optimally functioning. But since the public debt markets are either absent or illiquid and shallow, most large firms that need to raise debt resorted to the use of bank debt.

Using discrete choice analysis we find that size does matter when it comes to debt choice and use. The coefficient of size is positive in both models for all countries looked at. That is, an increase in size increases the probability of choosing both bank debt and non-bank debt. On whether size is important in determining the amount of debt, we find that it is

important in all countries except for Nigeria where its coefficient is insignificant but still positive.

Age is positively related to bank debt preference in Kenya, Nigeria and Ghana, but negatively related to bank debt preference in South Africa. In the non-bank debt model age is negatively related to non-bank debt in Kenya, South Africa and Nigeria. The age coefficient is however only significantly related to non-bank debt in the Nigerian model. With the exception of Nigeria we find a negative relationship between sales growth and both forms of debt. In the case of Nigeria the sales growth coefficients are not significant. The sales growth coefficients are significant in Kenya and South Africa confirming the hypothesis that more profitable firms prefer to use less debt. Exports are positively and significantly related to both forms of debt in Ghana. It is negatively related to bank debt in the Kenyan model.

On whether highly indebted firms tend to prefer more bank debt than the less indebted ones we find that highly indebted firms in Nigeria and South Africa tend to prefer more debt. Surprisingly, and contrary to the results on Nigeria and South Africa, we find that highly indebted firms in Ghana tend to prefer less bank debt. We find location to be an important factor in the case of South Africa only, where it is positively related to non-bank debt but negatively related to bank debt. When it comes to listing we did not find any evidence on whether listing on stock exchanges affect debt choice. This is probably because not many firms are listed on the stock exchanges in Africa and, more importantly, most of those firms that are listed do not really issue public debt. Thus whether a firm is listed or not does not seem to affect its debt choice.

Effect of ethnicity on firms' debt choice is only significant in Nigeria, where African-owned firms prefer more bank debt than non-African owned firms. We find that asset tangibility is positively related to bank debt in South Africa and Nigeria, and it is negatively related to non-bank debt in the two countries as well. We also find the education of a manager not to be important in all countries with the exception of Kenya where it is, surprisingly, negatively related to both forms of debt.

On whether the factors that affect the choice of debt do play a similar role when it comes to the amount of debt, we find this to be satisfied somewhat. For example, in South Africa, Kenya and Ghana we find that it was positively and significantly related to both forms of debt (bank debt and non-bank debt) as well as to the amounts of bank debt and non-bank debt used. This suggests that larger firms that preferred to use bank debt or non-bank debt managed to get such debt. Conversely, it suggests that small firms face severe problems when it comes to accessing debt than larger firms.

Profitability is positively related to both bank debt preference and its amount for the case of Nigeria, implying that profitable firms that prefer debt (especially non-bank debt) manage to get it. Surprisingly for South Africa there is a negative relationship between debt preference and profitability but a positive relationship between debt amounts and profitability. Also worthy noting is the confirmation of the pecking order theory predictions. Even though the data set we used in this particular section is different from that used in the debt-equity divide study we still managed to confirm that firms prefer internal to external funds.

There were mixed results when it comes to the impact of age on the amounts of debt among the sample countries. Age is negatively related to both forms of debt amounts in Kenya, Ghana and Nigeria, but it is positively related to both forms of debt in South Africa. Asset tangibility is positively related to bank debt preference as well as to bank debt amounts in the case of South African firms, implying that firms with high asset tangibility that prefer bank debt tend to get it. For Nigerian firms, a negative relationship between non-bank debt preference and asset tangibility and between the amount of non-bank debt and asset tangibility is found.

For the indebtedness variable we find that highly indebted firms in Ghana actually preferred less bank debt while in Nigeria highly indebted firms that preferred debt tended to use more of it.

On the question of whether heterodox variables like ethnicity, education, and location play an important role when it comes to debt preference we did not find ample evidence on this. Location does not seem to be critically important in determining debt use. We find that education of managers seems to play an important role in determining the amount of bank debt and non-bank debt in Kenya as it is positively related to both amounts of debt. It is however insignificant in models for the other countries. The coefficients of the variable *listed* are insignificant in both the debt choice and debt amounts models. Ethnicity seems to be important for South African firms, where African owned firms actually failed to access bank debt as compared to non-African owned firms.

When it comes to the comparability of our results with those from other empirical studies in developed economies we note that Denis and Mihov (2003) and Ojah and Manrique (2005) also found a positive relationship between debt choice and firms size. They also found a positive relationship between age and debt choice. Alonso *et al.* (2005) also found a positive relationship between the proportion of bank debt held and firm size. As in our overall result, Ojah and Manrique also found a positive relationship between the amount of bank debt held by firms and both size and age.

4.8 Policy Implications

A number of policy implications emanate from the study. Firstly, there is a need to develop the capital markets in African, especially the public debt markets. Not only will this facilitate the efficient flow of funds from surplus to deficit units in the financial markets but this will also improve the number of debt sources at the disposal of the firms. The second implication is that since size seems to be very important in accessing funds, with small firms facing severe problems, governments should continue to assist such firms so as to stimulate their growth. Thirdly, given the pivotal role of banks in supplying funds to firms there can be a deliberate policy to encourage banks to become part-owners of firms. This may facilitate the growth of firms, akin to the kind of production facilitation role that banks plays in the successful economies like Germany and Japan.

Chapter 4 Appendix

Correlation Matrices for Ghana, Kenya and South Africa and variable definitions

A4.1: Correlation matrix for South Africa

	Age	Salesgrowth	Asset Tangibility	Property Rights	Audited	Indebtedness	Location	Ethnicity	Listed	Education	Size	Export
Age	1.00											
Salesgrowth	-0.042	1.00										
Asset Tangibility	(-0.122)***	(0.24)***	1.00									
Property Rights	-0.01	-0.03	0.05	1.00								
Audited	(0.085)*	-0.02	(-0.08)*	(0.13)***	1.00							
Indebtedness	(-0.07)*	-0.05	-0.07	-0.06	0.03	1.00						
Location	0.08	-0.06	0.05	(0.07)*	(0.10)**	-0.05	1.00					
Ethnicity	-0.04	-0.02	0.06	0.06	-0.08	(-0.10)*	0.04	1.00				
Listed	(0.13)***	-0.016	0.02	-0.02	-0.02	-0.06	(-0.07)*	0.05	1.00			
Education	(0.134)***	-0.07	-0.04	(0.09)**	(0.09)**	(-0.14)***	0.06	0.06	0.10	1.00		
Size	(0.257)***	(-0.09)*	-0.04	0.4	0.04	-0.005	-0.04	-0.02	(0.23)***	0.14***	1.00	
Export	0.18	-0.02	(-0.12)***	0.02	0.02	(-0.08)**	(0.15)***	0.02	0.06	(0.26)***	(0.11)***	1.00

A4.2: Correlation matrix for Ghana

	Bankdebt	Non-bankdebt	Size	Age	Exports	Location	Indebtedness	Salesgrowth	Tradecredit
Bank debt	1.00								
Non-Bankdebt	0.200**	1.00							
Size	0.339***	0.237***	1.00						
Age	0.142	0.008	0.21**	1.00					
Exports	0.362***	0.281***	0.405***	0.153*	1.00				
Location	0.03	0.01	0.08	0.13	-0.09	1.00			
Indebtedness	0.34***	-0.05	0.004	0.08	0.04	-0.02	1.00		
Salesgrowth	0.096	0.038	0.500***	0.134	0.157*	0.17*	0.03	1.00	
Tradecredit	0.248	0.117	0.534***	0.208	0.479***	0.10	0.12	0.471***	1.00

A4.3: Correlation matrix for Kenya

	Bankdebt	Non-bankdebt	Age	Size	Salesgrowth	Location	Listed	Education	Audited	Export
Bankdebt	1.00									
Nonbankdebt	0.06	1.00								
Age	0.08	-0.07	1.00							
Size	0.18***	0.06	0.07	1.00						
Salesgrowth	0.12*	-0.03	0.09	0.71***	1.00					
Location	0.09	-0.01	0.02	0.03	0.15**	1.00				
Listed	-0.02	0.01	0.14	0.19**	0.38***	0.11*	1.00			
Education	0.01	-0.04	0.10	0.32***	0.37***	0.09	0.22***	1.00		
Audited	-0.01	-0.01	0.18***	0.06	0.04	-0.02	0.04	-0.08	1.00	
Export	-0.12*	-0.11*	-0.08	-0.35***	-0.35***	-0.07	-0.12*	-0.24***	-0.12*	1.00

A4.4: Correlation matrix for Nigeria

	Age	Salesgrowth h	Asset Tangibility	Audited	Indebtedness	Location	Ethnicity	Listed	Education	Size	Export
Age	1.00										
Salesgrowth	-0.03	1.00									
Asset Tangibility	-0.13*	-0.12	1.00								
Audited	0.18*	-0.06	0.09	1.00							
Indebtedness	0.03	-0.11	0.06	0.21**	1.00						
Location	0.37***	-0.11	-0.11	0.03	0.04	1.00					
Ethnicity	-0.19***	0.05	0.04	-0.08	-0.26	-0.24**	1.00				
Listed	0.336***	-0.17**	-0.11	0.05	0.04	0.16**	-0.14**	1.00			
Education	-0.11	-0.03	0.03	-0.11	-0.023	0.02	0.18*	-0.17	1.00		
Size	0.21*	-0.05	-0.10	0.09	0.12	0.07	-0.26	0.36**	-0.14	1.00	
Export	0.01	0.10	0.07	0.28	0.15	-0.07	-0.001	0.09	0.01	0.28***	1.00

*, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of years since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

Table A4.5: Definition of variables

Explanatory variable	Proxy for the explanatory variable
Profitability	Growth in sales ($\text{sales}_t - \text{sales}_{t-1}$)/ sales_{t-1}
Asset tangibility/collateral	Total fixed assets divided by total assets
Reputation	Age as measured by the number of years since the inception or incorporation of the firm.
Size	Number of employees
Growth opportunities	Research and development or investment/sales or assets
Education	Dummy =1 if manager or head of the firm has university degree or higher level of education and zero otherwise
Export	Dummy =1 if firm exports and zero otherwise
Audit	Dummy =1 if firm is audited and zero otherwise
Information availability	0,1 for firms that pay dividend
Ethnicity dummy	0,1 for firms owned by people of different ethnic origins
Indebtedness	Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.
Location	0,1 for firms located in different cities or provinces.
Sectoral dummies	0,1 for firms in different sectors/industries.

Appendix B

Table B4.0: Amount determinants for Kenya (for Appendix) Heckman

Explanatory variable	Bank debt	Non-bank debt
Intercept	12.307 (2.83)***	11.931 (6.61)***
Size	2.818 (7.13)***	1.617 (3.02)***
Age	-2.293 (-3.40)***	0.236 (-0.31)
Export	0.318 (0.78)	-1.647 (-1.80)*
Salesgrowth	0.013 (0.11)	-0.233 (-1.48)
Indebtedness	-0.492 (-0.82)	3.156 (1.83)
Location	-0.496 (-1.28)	
Listed	0.967 (1.25)	1.349 (1.42)
Education	0.951 (2.31)**	1.03 (1.83)*
Ethnicity	0.093 (0.15)	5.967 (4.19)***
Bakery	-0.867 (-1.40)	-2.84 (-3.24)***
Chemicals	1.614 (2.47)**	-4.606 (-5.84)***
Construction	-0.436 (-0.34)	
Furniture	-0.911 (-0.96)	
Metals	-0.576 (-0.82)	-1.360 (-1.38)
Printing	0.477 (0.79)	-1.924 (-2.53)**
Plastic	-0.105 (-0.20)	-1.00 (-1.02)
Leather		-1.932 (-1.47)
Textile	-0.687 (-1.05)	-4.842 (-5.35)
Garments	-1.239 (-1.82)	-4.477 (-3.80)***
Number of observations	194	194
Prob>chi2	0.000	0.000
Wald chi2	135.71	226.31
Log-likelihood		-92.07

t-statistics are in parentheses. *, **, *** show the levels of significance at 10%, 5% and 1% respectively.

Size is equal to the number of employees, age is the number of year since the incorporation of the firm, exports is a dummy equal to 1 if the firm exports its products and zero otherwise, location is a dummy equal to 1 if the firm is located in the capital city/province and is equal to zero if the firm located elsewhere. Sales growth is equal to sales in current year less sales in previous year divided by sales in previous year. Bank debt is a dummy equal to 1 if the firm used any bank debt in its new investment and is zero otherwise. Non-bank debt is a dummy equal to 1 if the firm used any non-bank debt and is zero otherwise. Indebtedness is equal to the amount of debt used in the new investment divided by the total amount invested.

Appendix C: The Heckman Procedure

This presentation follows Heckman (1976, 1979) and Stolzenberg and Relles (1997). Suppose equation (1) is the equation of interest we wish to estimate and that equation (2) is the selection equation corresponding to equation (1). Independent variables in (2) can be similar to those in (1) but they need not be.

$$Y_1 = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n + \varepsilon \sigma \dots\dots\dots (1)$$

$$Y_2 = \alpha_1 Z_1 + \dots + \alpha_q Z_q + \delta \dots\dots\dots (2)$$

Where ε and δ are normally distributed and σ is a scalar.

Let T be a selection threshold such that if $Y_2 > T$ then some data cases which satisfy the threshold are selected and those that do not are censored. Such censored cases are unobservable and are dropped from the sample when the equation is estimated. According to Heckman (1976, 1979) and Stolzenberg and Relles (1997), estimation results based on the selected cases only are biased. This need to be corrected by the inclusion of the inverse Mills Ratio as explained below. Firstly, we need to compute the conditional expectation of Y_1 given that Y_2 is greater than the threshold to get:

$$E(Y_1 / Y_2 > T) = \beta_0 + \beta_1 X_1 + \dots + \beta_n X_n + \sigma \rho_{\varepsilon\delta} \lambda(T - \alpha_1 Z_1 - \dots - \alpha_q Z_q) \dots\dots\dots (3)$$

Where: $\rho_{\varepsilon\delta}$ is the correlation between ε and δ

$$\lambda(T - \alpha_1 Z_1 - \dots - \alpha_q Z_q) = \frac{\phi(T - \alpha_1 Z_1 - \dots - \alpha_q Z_q)}{1 - \Phi(T - \alpha_1 Z_1 - \dots - \alpha_q Z_q)} = \text{Inverse Mills ratio.}$$

$\phi(t)$ is the normal density function evaluated at t and $\Phi(t)$ is the corresponding cumulative density function evaluated at t as well.

Basically, to produce unbiased results, equation (1) must, in addition to the stated variables, also include the inverse Mills ratio as stated above.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

Modigliani and Miller's (1958, 1963) seminal work on capital structure saw an exponential growth of both theoretical and empirical work on capital structure. The investigations on the determinants of capital structure have however concentrated on developed economies, especially the USA economy. As a result there is a dearth of literature on how firms in Africa raise capital. The thesis attempted to fill this gap in the literature.

This thesis looked at how firms in Africa finance their investment activities. We looked at three related issues that are important when it comes to raising capital. The first issue looks at financial development and the institutional environment in which firms operate. A look at the institutional environment and the supply side of finance is important as it helps us explore the pace of financial development and institutional reforms in Africa. This enables us to better understand the different obstacles which firms face as they devise strategies to raise capital.

The second issue looks at capital structure determinants. There are a number of capital structure theories in the extant literature. The thesis tested a number of the theories on five African countries: Ghana, Kenya, Nigeria, South Africa and Zimbabwe. The third related issue is on debt choice. Most theories and empirical studies on capital structure dwell on the debt-equity divide (i.e., how firms raise capital using debt or equity). There is a separate, but related, strand of literature that focuses on corporate debt. Theoretical and empirical studies on this look at the determinants of corporate debt structure (i.e., what kind of debt do firms prefer and how much of such types of debt do they hold?). These two issues are basically demand-side issues, since they look at the demand for finance by firms.

The aim of this conclusion is to highlight the three issues addressed in this thesis and explain the different factors that affect the way firms raise capital and how the

environment in which they operate can affect such behaviour. We bring the insights from the analyses of these study areas together and proffer possible policy advice.

5.2 Financial Markets

Firms in Africa find themselves in a difficult situation when it comes to raising external capital. The capital markets are underdeveloped. The stock markets in Africa are a potential source of external funds but at the moment the stock exchanges are very small, illiquid, dominated by institutional investors that buy securities to hold and the majority of firms do not use them to raise capital as most firms in Africa are unlisted. The corporate debt markets are in nascent stages of development and are dominated by government. The environment in which they operate is characterized by information asymmetry, corruption, contract enforcement inefficiency, macroeconomic instability and policy uncertainty. All such factors reinforce each other, creating an environment in which surplus-saving economic units are less willing to relinquish the control of their excess funds to firms that need them; and in cases where they extend credit they are less willing to offer them long-term finance. Consequently, most firms depend largely on internal funds for new investments and when they acquire external funds they tend to use short-term debt. Given the potential role that the private sector can play in driving economic growth in Africa, internal funds alone are hardly enough for sustainable growth.

5.3 Capital Structure Determinants

Many of the empirical studies on capital structure are based on developed economies. In this thesis, eclectic models were used to test the different capital structure theories using firms from five African countries: Ghana, Kenya, Nigeria, South Africa and Zimbabwe. The main determinants of capital structure whose impact we investigated are: profitability, taxation, age, risk, size, bankruptcy and asset tangibility. The analysis was done using both cross-sectional and panel data. The analysis educated us on a number of issues. The first issue concerns the extent to which firms in the sample countries are leveraged. The data shows that in terms of leverage (as measured by the total debt ratio), the firms in Africa are roughly levered to the same extent as those in other developing economies such as Mexico, Thailand, Brazil, South Korea, Malaysia, Jordan and Turkey.

However, when one further looks at the maturity structure of debt, one finds that the proportion of short-term debt to total debt is higher for African firms and lower for firms in developed economies. When it comes to the use of long-term debt the ratio of long-term debt to total debt is higher for firms in developed economies and lower for firms in Africa. This result confirms hypothesis 5 in chapter 3 which states that firms in Africa use more short-term debt than long-term debt as compared to those in developed economies.

The second important lesson is that profitability is, by and large, negatively related to leverage. The result confirms hypothesis 1 in chapter 3 which states that more profitable firms borrow less as compared to less profitable ones. This is consistent with the findings by Rajan and Zingales (1995), Booth *et al.* (2001), Chen (2004) and Huang and Song (2006). The result implies that profitable firms in Africa tend to use retained earnings to finance assets before considering borrowing. Whilst this may be in support of the pecking order theory there may be more than just pecking order theory at play here. Factors such as debt covenants, property rights issues, governance and enforceability of contracts may actually force firms to rely on retained earnings instead of debt in general.

The third lesson is that asset tangibility, whilst expected to be positively related to leverage (in the collateral role), is actually negatively related to debt in most countries in the sample. The reason proffered in the literature as to why leverage and asset tangibility may be positively related is that a company with a strong asset base can use those assets as collateral to secure loans. The important question then becomes: why are African firms not using their assets to secure loans? Is it because banks are not accepting the assets as effective collateral? Maybe they cannot put a true market value on the assets-in-place because the secondary markets for these assets are poor in Africa (Collier and Gunning, 1999). Or is it because of problems with the enforceability of contracts? The other possible reason could simply be due to the ineffectiveness of credit markets in developing economies (Demirguc-Kunt and Maksimovic, 1994).

The third reason, and probably the most plausible one in our case, is that debt financing of African firms is largely of short-term nature as compared to long-term. Long-term debt rather than short-term debt is usually secured via the use of physical assets as collateral. Short-term debt dominates the debt used by firms in Africa and it does not usually require collateral. All the above reasons are plausible. Further research would go a long way in verifying the findings documented here.

The fourth lesson is that country-specific factors seem to play a role in determining leverage. The countries looked at seem to have lower debt ratios as compared to South Africa, which has more sophisticated and more complete national capital markets than the other sample countries. Generally most firms seem to be taking advantage of tax deductibility such that in most regressions the tax rate tends to be positively related to leverage. This is consistent with the findings by Green and Mutenheri (2002). The result confirms hypothesis 2 in chapter 3 which states that high corporate taxation encourages firms to use more debt to finance their activities.

The results showed that firm size does matter. From the cross sectional regressions we found a positive relationship between leverage and size for all the countries. This supports hypothesis 4 in chapter 3 which states that firm size and leverage are positively related. Since size can be used as an inverse proxy for probability of bankruptcy, this finding also confirms the hypothesis that larger firms are less likely to fail and are thus more likely to get more debt funds than smaller firms whose probability of failure is higher.

Whilst age may be important as a determinant of leverage, in most regressions for the sample African countries this does not seem to be the case. It seems that the age variable is not an important variable in the determination of leverage. Risk is important for firms in some countries while unimportant in others.

Table 3.23, in chapter 3, compares our results with the theoretical expectations as well as with the findings from other studies conducted in developing and developed economies.

As can be seen from that table, our results are consistent with a number of findings from other studies. For example, our finding that profitability is negatively related to leverage is also supported by Rajan and Zingales (1995), Booth *et al.* (2001), Huang and Song (2006) and Chen (2004). Our finding that leverage (as measured by total debt ratio) was in a majority of cases positively related to size is a confirmation of the findings by Wiwattanakantang (1999), Chen (2004) and Huang and Song (2006). Our finding that asset tangibility and leverage are positively related also confirms the findings by Rajan and Zingales (1995), and Wiwattanakantang (1999). We were somewhat surprised by the result that showed that risk and leverage are positively related. In their study of Thai and Zimbabwean firms, Wiwattanakantang (1999) and Mutenheri and Green (2002), respectively, also found the same result. Corporate tax and leverage were, by and large, positively related in our study, which is consistent with the findings by Mutenheri and Green (2002).

5.4 Corporate Debt Structure

Debt choice in African countries is investigated in chapter 4. Using an incremental credit demand approach adopted from Denis and Mihov (2003), we investigated the determinants of corporate debt choice in Ghana, Kenya, Nigeria and South Africa.

Given that African debt markets are essentially bereft of public debt markets, we suspected heavy use of bank debt. This turned out to be true since, on average, about 70% of the total incremental debt used by the firms in the countries looked at came from banks as loans. This confirms hypothesis 6 in chapter 4 which states that bank debt dominates other sources of debt. The use of bank debt is also increasing with size: we found that larger firms tend to use more bank debt as compared to smaller ones, confirming hypothesis 2, in chapter 4. This also confirms Hooks (2003) and Diamond's (1991) argument that very small firms are at the wrong side of the reputation spectrum and thus fail to get bank loans.

Larger firms that prefer bank debt tend to get it as compared to smaller ones. This confirms the hypothesis that larger firms have acquired the requisite reputation which would have given them access to cheaper arms-length debt if public debt markets were

operational. But since the public debt markets in most African countries are still in their early stages of development, most large firms that need to raise debt tend to resort to the use of bank debt.

Using discrete choice analysis, we found that size does matter when it comes to debt choice and use. The coefficient of size is positive in both the bank debt and non-bank debt choice models for all sample countries. That is, an increase in size increases the probability of choosing both bank debt and non-bank debt in all the countries. On whether size is important in determining the amount of debt firms use, we found that it is important in all countries except for Nigeria where its coefficient is insignificant but still positive.

Age is positively related to bank debt preference in Kenya, Nigeria and Ghana, but negatively related to bank debt preference in South Africa. In the non-bank debt model age is negatively related to non-bank debt in Kenya, South Africa and Nigeria. The age coefficient is however only significantly related to non-bank debt in the Nigerian model.

With the exception of Nigeria there was a negative relationship between profitability and both forms of debt, confirming the hypothesis that more profitable firms prefer to use less debt. Exports are positively and significantly related to both forms of debt in Ghana. It is negatively related to bank debt in the Kenyan model.

We also found that highly indebted firms in Nigeria and South Africa tend to prefer more debt. Surprisingly, and contrary to the results on Nigeria and South Africa, we found that highly indebted firms in Ghana tend to prefer less bank debt. We found location to be an important factor in the case of South Africa, where it was positively related to non-bank debt but negatively related to bank debt. When it comes to listing, we did not find any evidence on whether listing on stock exchanges affect debt choice. This is probably because not many firms are listed on African stock exchanges and, more importantly, most of those that are listed do not really issue public debt. Thus whether a firm is listed or not does not seem to affect its debt choice.

The effect of ethnicity on firms' debt choice was only significant in Nigeria, where African owned firms prefer more bank debt than non-African owned firms. We found that asset tangibility is positively related to bank debt in South Africa and Nigeria, and it is negatively related to non-bank debt in the two countries as well. The education of a manager was found not to be important in all countries with the exception of Kenya where it was surprisingly found to be negatively related to both forms of debt.

On whether the factors that affect debt choice do play a similar role when it comes to the amount of debt used, we found this to be satisfied somewhat. For example in South Africa, Kenya and Ghana we found that size was positively and significantly related to both forms of debt (bank debt and non-bank debt) as well as to the amounts of bank debt and non-bank debt used. This suggests that larger firms that preferred to use bank debt or non-bank debt managed to get such debt. Conversely, it suggests that small firms face severe problems when it comes to accessing debt than larger firms.

Profitability is positively related to both bank debt preference and its amount for the case of Nigeria, implying that profitable firms that prefer debt (especially non-bank debt) manage to get it. Surprisingly, for South Africa there is a negative relationship between debt preference and profitability but a positive relationship between debt amounts and profitability. Worthy noting is the tendency for firms to prefer internal to external funds. This is in line with the pecking order theory predictions that were confirmed in chapter 3 which looked at the debt-equity divide.

There were mixed results when it comes to the impact of age on the amounts of debt held among the sample countries. Age is negatively related to both forms of debt amounts in Kenya, Ghana and Nigeria, but it is positively related to both forms of debt in South Africa. Asset tangibility was positively related to bank debt preference as well as to bank debt amounts in the case of South African firms, implying that firms with high asset tangibility that prefer bank debt tend to get it. For Nigerian firms, a negative relationship between non-bank debt preference and asset tangibility and between the amount of non-bank debt and asset tangibility was found, implying that firms that did not prefer bank

debt actually used less of it. For the indebtedness variable, we found that highly indebted firms in Ghana actually preferred less bank debt while in Nigeria highly indebted firms that preferred debt tended to use more of it.

On the question of whether heterodox variables like ethnicity, education, and location play a significant role when it comes to debt preference we did not find ample evidence on this. Location was not found to be critically important in determining debt use. We found that education of managers seems to play an important role in determining the amount of bank debt and non-bank debt in Kenya as it was positively related to both amounts of debt. It was however insignificant in models for the other countries. Listing or not listing does not seem to matter when it comes to debt choice. This is not surprising given that arms-length debt markets in Africa are still underdeveloped and most firms do not issue corporate debt. Ethnicity seemed to be important for South African firms, where African-owned firms actually failed to access bank debt as compared to non-African owned firms.

When it comes to the comparability of our results with those from other studies in developed economies we note that Denis and Mihov (2003) and Ojah and Manrique (2005) also found a positive relationship between debt choice and firms size. They also found a positive relationship between age and debt choice. Alonso *et al.* (2005) found a positive relationship between the proportion of bank debt held and firm size. As in our overall result, Ojah and Manrique found a positive relationship between the amount of bank debt held by firms and both size and age.

It must however be noted that our results are based on a survey dataset. Most studies of this nature have used financial statements. Panel data would also have improved our understanding of the behaviour of the firms when it comes to debt choice and use.

5.5 Policy Implications

A number of policy implications emanate from the study. Firstly, there is a need to develop the capital markets in Africa, especially the public debt markets. Not only will this facilitate the efficient flow of funds from surplus to deficit units in the financial

markets but this will also improve the number of debt sources at the disposal of the firms. Well developed markets can also facilitate the financing of investment activities using long-term rather than short-term debt. The benefits emanating from stock markets increase with the size of stock markets (Adjasi and Biekpe, 2006; N'zue, 2006). In Kenny and Moss (2001) the negative effects of stock markets are acknowledged but such effects are much smaller than the concomitant benefits.

The second implication is that since size seems to be very important in accessing funds, with small firms facing severe problems, governments should continue to assist such firms so as to stimulate their growth. Thirdly, given the pivotal role of banks in supplying funds to the firms there can be a deliberate policy to encourage banks to become part-owners of firms. This may facilitate the growth of firms, akin to the kind of production facilitation role that banks play in successful economies such as Germany and Japan.

One important finding from the capital structure study is that firms in Africa tend to make heavy use of short-term debt as compared to long-term debt. It is important for governments to establish policies that facilitate the development of public debt markets where corporate bonds and other long-term debt instruments are traded. More importantly, governments need to create an enabling environment that can see the active participation of the private sector in the bond markets, whereby more financial institutions create financial intermediation vehicles that permit firms to borrow funds for longer periods. Other factors that may force firms to use short-term debt include high inflation levels and macroeconomic instability. High inflation and macroeconomic instability result in uncertainty forcing firms to rely heavily on short-term debt. The governments must therefore ensure stable macroeconomic environments.

African firms seem to follow pecking order theory postulations when it comes to raising capital. Given that the pecking order theory is based on information asymmetry it seems that models based on information asymmetry may be more suitable for the African environments in which the degree of information asymmetry is very high. The implication is that African governments must make some concerted efforts to reduce the

degree of information asymmetry. Akerlof (1970) argues that the degree of information asymmetry, if it is very high, can result in a market failing to exist. The degree of information asymmetry may be reduced by establishing credit bureaus and information registries as well as encouraging more and more firms to list on stock exchanges. The stock exchanges themselves may then stipulate information disclosure requirements that are in line with best practice.

5.6 Questions for further research

The debate on capital structure is yet to be concluded. At this juncture most theories that have been tested are only conditional theories and no general theories have been established (Myers, 2003). The debate on capital structure needs to be “exported” to the developing economies, especially to Africa, where the capital structure theories developed for USA listed firms should be tested. As more and more Africa countries establish stock exchanges, the capital structure investigations must include more and more African countries. The aim being not only to compare the results from African firms with those on firms from developed economies, but also to compare the results among Africa countries. This is especially important given the diversity of financial markets in Africa.

There are a number of research issues not addressed in this thesis that need further investigation. These include the following:

1. The first issue is on the pecking order theory. From our investigations it would seem that listed firms in Africa tend to follow pecking order theory postulations. What was not thoroughly investigated however is why they tend to use retained earnings as they do?¹⁰⁵ The reason for them to choose retained earnings may be different from the reasons proffered by firms in developed markets that also follow the pecking order theory. For African firms, factors like contract enforceability, justice system efficiency and property rights issues may be more important. To do justice to such an issue, instead of using secondary data on listed

¹⁰⁵ Is there, for example, an “Africa Pecking Order” that is unique to African environments akin to what Chen (2004) found in China?

firms as done in this particular study one can establish a survey instrument that specifically asks why firms use retained earnings as they do.

2. An important known fact concerning African stock exchanges is that there are few listed firms. This is puzzling given that one of the critical constraints raised by firms in most African countries is that of access to finance. To our knowledge no research has been done to understand why African stock exchanges tend to have few firms. What exactly are the factors that affect the decision to list on stock exchanges in Africa? What can be done to make it easier for more firms to list on stock exchanges?
3. In the African context, what is the relationship between firm performance and its capital structure? Do highly leveraged firms perform better than lowly leveraged firms? This is important given the acknowledged potential role of the private sector in stimulating growth and reducing poverty.
4. Should African countries be bank-based or market-based? That is, can banks “rev the engine of growth” better than stock markets in Africa?
5. The pecking order theory is based on information asymmetry. The degree of information asymmetry is acute in most African countries. However, because of technological changes, more and more information about listed firms is becoming available to the generality of the population in Africa. Thus the degree of information asymmetry is improving overtime. Has this affected the extent to which firms rely on internal funds?

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