

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

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**Capital and Debt Maturity Structures of a Firm:
Evidence from Selected African Countries**

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Extended Abstract

Recent decades witnessed extensive theoretical and empirical efforts that have been directed at understanding the dynamics surrounding the financing decisions of firms although there has not been either a universal theory or an empirical consensus. Based on a critical assessment and analysis of the literature, the thesis argued not only that there is a substantial dynamic component in the financing decisions of firms but also that those decisions are a function of firm, industry, institutional and macroeconomic factors. Although the literature, lately, has taken a fast leap to assess the nexus between industrial, institutional and macroeconomic factors, on the one hand, and financing decisions of a firm, on the other, we are yet to witness similar endeavours within the African setting. Conducting a study of this nature is important because there are profound differences between the institutional and macroeconomic milieu of African countries and those of the advanced economies where such a research is abundant. And, these institutional and macroeconomic differences have important policy implications.

Using comprehensive model specifications consisting of firm, industrial, macroeconomic and institutional variables and both static and dynamic econometric procedures, the thesis examines the relationship between “conventional” firm, industrial, institutional and macroeconomic factors, on the one hand, and financing decisions of a firm, on the other. Financial statement data over a period of 10-years (1999-2008), extracted from OSIRIS database, pertaining to 986 non-financial firms drawn from nine African countries - Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia - were analysed. The financial statement data were used to capture “conventional” firm-specific characteristics that were known to effect on financing decisions of a firm. The sample firms were classified into 10 industries using the US SIC (4-digits) following Song and Philippatos (2004). Institutional and macroeconomic data necessary for the analyses were

obtained from secondary sources such as the World Development Indicators, Financial Structure Database of the World Bank, the personal website of Andrei Shleifer (a Harvard Economics Professor), Kaufmann, Kraay and Mastruzzi (2009) and Berkowitz, Pistor and Richard (2003).

Consistent with theory and empirical literature, a battery of estimation procedures point out that basic capital structure of sample a firm is significantly associated with a set of “conventional” firm-specific factors including firm size, profitability, dividend payout, tangibility and non-debt-related tax shield. This suggests that costs of agency, transaction and financial distress, information asymmetry and adverse selection and tax issues are important consideration in basic capital structure decisions of sample firms. The evidence also shows that short-term and total leverage of firms in the Wholesale and Retail and Chemical and Construction industries are significantly higher than those of firms in the Manufacturing industry while long-term leverage of firms in Regulated industries tends to be higher than is the case for firms in the Manufacturing industries. Furthermore, the thesis documents that leverage is affected not only by firm-specific factors but also by a host of institutional (i.e., shareholder rights protection, creditor rights protection, rule of law, size of banking sector and development of stock market) and macroeconomic (i.e., GDP per capita, Growth rate of real GDP per capita, inflation) factors in a statistically significant manner. In addition to the direct influences, macroeconomic conditions exert indirect influences on basic capital structure by enhancing or mitigating the effect of firm-specific factors on leverage.

In an effort to further extend the debate on capital structure in the African setting, the thesis developed a dynamic partial adjustment model (DPAM) which made the joint estimation of adjustment speed of basic capital structure and its determinants possible. The results from system-GMM dynamic panel data estimation procedure showed that firms in Africa not only adjust their basic capital structure to a target but also face varying degrees of

adjustment costs and/or benefits in doing so. Furthermore, the evidence indicates that the extent of costs and/or benefits that firms in Africa face in adjusting their basic capital structure is determined, *inter alia*, by firm-specific factors such as firm profitability, size, growth opportunities, and the gap between observed and target capital structure. This evidence signifies the role that transaction costs, financial flexibility and access to external finance play in adjustment speed decisions of firms in our sample. Also, the research found that firms in riskier industries adjust their basic capital structure faster than those in less risky ones implying that probability of bankruptcy has important place in determining adjustment costs and/or benefits of firms in our sample. The findings also showed that institutional (i.e., legal origin, shareholder and creditor rights protection, rule of law, size of banking sector and stock market development) and macroeconomic (i.e., GDP per capita, marginal corporate tax rate and inflation) factors are significantly associated with the costs and/or benefits of adjustment suggesting that agency costs, access to external finance and tax issues may well play a role in the optimal financing choices of firms in our sample.

The thesis also extends the debate on debt maturity structure front by examining its determinants within the context of firms in Africa. Although Gwatidzo (2009:149-222) dealt with debt structure, his focus was on the mix of the sources of debt. This thesis, on the other hand, focuses on debt maturity structure and to that extent it is new in the African setting. Based on a range of econometric procedures, our evidence confirms that debt maturity structure of firms in the sample is influenced by “conventional” firm-specific characteristics such as earnings volatility, asset maturity, profitability and dividend payout ratio. The thesis also indicates that firms in Oil and Gas, Regulated and Service industries incline to have longer debt maturities while those in Durables, Chemical and Construction, Business equipment, Wholesale and Retail and Health industries incline to have shorter debt maturities. The study also documents that macroeconomic variables (i.e., income groups of a

country, GDP per capita, growth rate of real GDP per capita and marginal corporate tax rate) effect on debt maturity structure of firms in our sample. Also, the evidence establishes that there is a nexus between institutional variables (i.e., stock market development, size of banking sector, shareholder and creditor rights protection) and debt maturity structure of sample firms. In addition to the direct effects, the findings show that broadly defined macroeconomic and institutional variables had indirect effects on debt maturity structure by either mitigating or enhancing the influence of firm-specific factors. The fact that some commonality between the determinants of basic capital structure and debt maturity was observed reinforces the view that the two financing decisions are highly intertwined and, perhaps, jointly determined.

Despite the close attention that determinants of adjustment speed of basic capital structure have received in the extant literature, we are yet to see similar studies on the adjustment speed of debt maturity structure both in the developed and developing world. To this extent, the evidence documented in this thesis is new. System-GMM estimation results indicate clear evidence that there is a substantial dynamic component in the debt maturity structure of our sample firms and also that the dynamism is dependent on firm, industry and country level factors. Specifically, the study shows that the extent of adjustment costs and/or benefits of firms in our sample are inversely related to firm size, growth opportunities and the distance between observed and target debt maturity structure. This suggests that agency, transaction and financial distress costs are important determinants of the costs and/or benefits of straying away from the equilibrium debt maturity structure. Also, the thesis documents that firms in the Service industry move towards their target debt maturity structure relatively rapidly than is the case in other industries. In contrast, firms within the Durables and Oil and Gas industries adjust their debt maturity structure relatively slowly towards their optimum. The implication of this particular finding is that cost of debt, cost of agency and liquidity

pressure have a role to play in the determination of the adjustment speed of debt maturity structure of firms in our sample. Finally, the thesis proffers evidence that institutional (i.e., legal origin, shareholder and creditor rights and rule of law) and macroeconomic (i.e., GDP per capita and growth rate of real GDP per capita) factors have a statistically significant influence on the costs and/or benefits of adjustment to a target debt maturity structure.

Overall, the evidence documented in this study signify the prevalence of problems related to agency and enforceability of contracts, investor protection, information asymmetry, adverse selection and moral hazard, access to finance and financial flexibility, transaction costs and tax regimes in the sample countries. The current study proposes policy interventions that governments and policymakers of developing/emerging economies in general and the sample countries in particular may find useful.

This study contributes to the capital and debt maturity structure literature in several ways. First, it extends the work of Gwatidzo and Ojah (2009) by directly examining the influence of industrial, institutional and macroeconomic variables, in addition to the “conventional” firm-specific factors, on basic capital structure decisions of firms within the African context. It also introduced new variables (at firm, industry and country levels) and used bigger samples (both in terms of number of firms and countries) and better econometric procedures. The current study is a first attempt to directly examine the nexus between a host of industrial, institutional and macroeconomic variables on basic capital structure decisions of a firm within the African milieu.

Second, despite existence of extensive theoretical and empirical efforts on the subject of capital structure choice, much less is known about debt maturity structure of firms. This paucity is even worse when we consider the literature within the African context. The only exception to this phenomenon is Chapter 4 of the unpublished doctoral work of Gwatidzo (2009). Unlike the work of Gwatidzo which focused on the mix of debt sources, the current

study focuses on the debt maturity structure of firms (i.e., the long-term vs. short-term mix). There is no published work yet along the lines of the determinants of debt maturity structure in Africa. This thesis attempts to fill this gap.

Third, at the core of the debate on basic capital and debt maturity structure has been whether a firm exhibits target behaviour. Although the literature has taken a new leap by considering dynamic specifications that allow for target adjustment of capital and debt maturity structures, there is no empirical work which looks at the manner in which firms in Africa adjust their financial structure over time. Again, this study is a first attempt to investigate determinants of the adjustment speed of financial structure using data pertaining to firms in selected African countries.

Fourth, there is a long tradition of examining industry effects on financing decisions of firms. However, neither single-country nor cross-country studies carried out in the African setting addressed this important dimension in the capital and debt maturity structure debate. In the present study, the research includes industry variables to examine the role of industry characteristics on firm's financing decisions.

Declaration

I, Tesfaye Taddese Lemma, do hereby certify that this thesis which is submitted to the University of the Witwatersrand, Johannesburg is my own work and all sources that I have used or quoted have been indicated and acknowledged by means of complete reference.

Signature of candidate

February 2012

Date

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CHAPTER 1

INTRODUCTION

1.1 Background to the Study

There is a large body of literature that studies the link between finance and economic growth, however, the debate on the direction of causality remains unsettled (e.g., King and Levine 1993; Beck, Levine and Loayza 2000). Corporate financing decisions¹ have important bearings on policy matters at macro- and micro-levels. At macro-level, they have bearings on a country's overall competitiveness, financial development and interest rates and securities price determination and regulation. They also affect micro-level issues such as capital structure, debt maturity structure, dividend policy, corporate governance and corporate development (e.g., Singh and Hamid 1992; Browne 1994; Green, Murinde and Suppakitjarak 2003). Although corporate financing decisions have such far reaching consequences, how firms in developing countries [in general and in Africa in particular] finance their investments and what combination of factors determine their financing dynamics remains an unsettled academic and policy question (e.g., Prasad, Green and Murinde 2001).

Since the late 1950s, there has been a preponderance of empirical and theoretical debates on the relevance [or irrelevance] of corporate financing decisions to firm value. The path-breaking work of Modigliani and Miller (1958, MM hereafter) provided a much sought direction for exploring and explaining firm's financing decisions. According to MM (1958), under certain conditions, neither the decisions on basic capital structure (i.e., debt-equity mix) nor those on debt maturity structure (i.e., long term-short term mix) should impact firm value. Several subsequent researches, however, have endeavoured to relax some of the conditions

¹ Although the phrase "financing decisions" may refer to a range of decisions related to sources of finance, capital structure, debt maturity, dividend policy, etc made by an "agent", in the context of this thesis, it refers to capital structure decisions of a firm where the debt-equity composition and its dynamics are determined or the debt maturity structure decision of a firm where the maturity composition and its dynamics are determined.

imposed in MM (1958), and forwarded theoretical and empirical arguments favouring the “relevance” of financing decisions in the determination of firm value. Despite the bounteous research efforts, there hasn’t been one universal theory that explains the financing decisions of a firm (e.g., Myers 2001). The extant literature identifies a range of conditional theories.

As in the theoretical literature, empirical endeavours are far from consensus even on some of the most basic issues conclude Elsas and Florysiak (2008). In a presidential address to the American Finance Association, Stewart Myer (1984) famously asked “how do firms choose their capital structure?” Expectedly, his answer was “we don’t know.” Fifty years after MM’s (1958) seminal paper, Stewart Myer’s (1984) answer is still valid. Nonetheless, we have gained significant insights into both capital and debt maturity structure “puzzle.” Broadly speaking, two important “stylized facts” emerged from past endeavours to empirically differentiate between competing theories. First, there is a substantial dynamic component in the determination of both basic capital structure and debt maturity structure of firms (e.g., Antoniou, Guney and Paudyal 2006; Flannery and Rangan 2006; Antoniou, Guney and Paudyal 2008; Dang 2011; Deesomsak, Paudyal and Pescetto 2009; Terra 2011). Second, firms’ financing decisions are a function of not only firm-specific factors but also of industry, macroeconomic and institutional factors (e.g., Rajan and Zingales 1995; Demirguc-Kunt and Maksimovic 1996; De Jong, Kabir and Nguyen 2008).

Notwithstanding the headway that has been made, the extant literature on the subject of financing decisions has several shortcomings. Most previous empirical work is limited to single-country studies (e.g., De Jong et al. 2008; Terra 2011). It is especially so with regard to debt maturity decisions. Of course, single-country studies would advance our understanding of firm’s financing decisions by helping us identify firm-specific variables that determine its financing decisions. Such studies, by design, won’t provide explanations for cross-country variations in financing decisions, nonetheless. Lately, mindful of this

shortcoming of single-country studies, the literature witnessed a proliferation of cross-country studies (e.g., Rajan and Zingales 1995; Demirgüç-Kunt and Maksimovic 1999; Antoniou et al. 2006; 2008; Deesomsak et al. 2009; Terra 2011). These cross-country studies predominantly focus either on advanced economies or, at most, non-African economies, however².

We, however, know that cross-country differences in macroeconomic and institutional characteristics do explain part of the variation in financing decisions (e.g., Rajan and Zingales 1995; Demirguc-Kunt and Maksimovic 1996; Booth, Dermirguc-Kunt and Makismovic 2001). We also know that developing/emerging economies in general and African economies in particular are epitomized by: (i) relatively inefficient and incomplete capital markets; (ii) noticeably higher information asymmetry; and (iii) somehow different financing arrangements compared to advanced economies (e.g., Eldomiaty 2007). Thus, studies carried out in the context of developed economies could be of limited applicability for decision making in the context of African economies.

The notable exception to this disturbing dearth of cross-country studies in the African context is the recent work by Gwatidzo and Ojah (2009) on capital structure and Gwatidzo (2009:149-222) on debt [source] choice. Looking at a sample of firms from five selected African countries - Ghana, Kenya, Nigeria, South Africa, and Zimbabwe – the authors report presence of cross-country variations in both basic capital structure as well as debt [source] choice. Chapter 2 of this thesis extends the work of Gwatidzo and Ojah (2009) in several ways. Firstly, by including civil code countries in the sample, it explicitly investigates the role of legal institutions on capital structure decisions of a firm. Secondly, by including macroeconomic characteristics of sample countries into the models, it directly examines the role of macroeconomic variables on capital structure decisions of a firm. Thirdly, by

² Although the works of Sing and Hamid (1992), Singh (1995), Booth et al. (2001), Prasad et al. (2001), and Terra (2011) focused on developing/emerging economies, they were on non-African economies.

including industry indicator variables, it improves model specifications, and hence, assesses the inter-industry variation in capital structure decision of sample firms. Fourthly, by using better econometric procedures (i.e., system GMM and SUR), it addresses endogeneity problem that usually plagues capital structure research.

Myers (1984) insightfully suggests that the main empirical implication of hypotheses that fall under trade-off theories is that firms should adjust their capital structure to some optimal level if shocks to actual leverage occur. Heeding to this suggestion, recently, the literature witnessed what could arguably be called a very fruitful and important approach in designing empirical tests that could discriminate between trade-off theories and other competing theories (Elsas and Florysiak 2008). There has been a proliferation of empirical literature that supports not only that there is a substantial dynamic component in a firm's financing decisions but also that the dynamism depends on firm, industry, macroeconomic and institutional factors (e.g., Drobetz and Wanzenried 2006; Drobetz, Pensa and Wanzenried 2007; Flannery and Hankins 2007; Deesomsak et al. 2009; Terra 2011). In the context of Africa, there is no published work that investigates the dynamic partial adjustment of a firm's basic capital structure and debt maturity.

Using data collected from nine African countries, the current study examines the influence of firm, industry, macroeconomic and institutional factors in the determination of both basic capital structure and debt maturity structure of a firm. It also investigates whether firms in the sample countries adjust their capital and debt maturity structures to a target, and if so, what factors determine the pace at which firms adjust their capital and debt maturity structures to a target. Carrying out such a study in the context of African countries is very important for, at least, two reasons. First, the popular view holds that the highly imperfect legal and market institutions in African economies hinder access to finance by firms which in turn is an impediment for investment and growth. Findings of this study will enhance African

governments' and policymakers' understanding on how they may use policies and legislations to reduce firms' financial constraints to boost investment and growth. Second, it will provide an opportunity for examining the salient features of financing decisions in African countries, and hence, will serve as an "out-of-sample" test for financial theories developed in the heavily studied Western economies. The following subsections provide background information regarding the institutional and macroeconomic setup of sample countries; the problem statement; the specific research questions and objectives; the research paradigm, approach, and design; the contribution and significance of the study; and the outline of the study.

1.2 Institutional and Macroeconomic Environment as a Background to the Study

Consistent with institutional theory which explains how a firm's behaviour and practices are moulded through changes induced by contextual pressures³, recent literature on firm finance suggests that financial decisions of a firm could hardly be understood in isolation from the institutional – legal and financial - and macroeconomic environment that characterizes the country in which it operates (e.g., Booth et al. 2001; Deesomsak et al. 2004; 2009; Antoniou et al. 2006; 2008; Fan, Titman and Twite 2008; Lopez-Iturriaga and Rodriguez-Sanz 2008). This is partly because institutional and macroeconomic environment of a country vitally determines the supply of capital by surplus units and demand for capital by deficit units for financing investments (Faulkender and Petersen 2006). This section presents some contextual information regarding the institutional and macroeconomic environment in Africa, with particular emphasis on the sample countries. We especially look at the evolution of legal and financial institutions and select country-characteristics that define macroeconomic conditions.

³ DiMaggio and Powell (1983) in their seminal work entitled 'The iron cage revisited: institutional isomorphism and collective rationality in organizational fields' published in the American Sociological Review present an elaborate discussion on institutional theory.

1.2.1 Legal institutions

The role of institutional context in examining the dynamics in firm finance was recognized as early as Rajan and Zingales (1995). Although they do not directly investigate the effect of institutional differences on capital structure, Rajan and Zingales (1995) remark that the differences that they found in capital structure determination among G-7 countries could partly be due to differences in the tax code, bankruptcy laws, the state of development of bond markets and patterns of ownership, suggesting that future research should focus on analyzing the relation between institutional characteristics and capital structure determination.

The earlier literature had suggested that the role of law on corporate finance, in comparison to competitive capital, product and labour markets, is at best of secondary importance or even trivial (e.g., Easterbrook and Fischel, 1991; Black, 1990). In a serious rebuttal to this view, La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998) show that legal institutions are rather “front-bench-sitters” when it comes to the determination of financing decisions of a firm. They examine the influence of laws governing investor protection, the quality of enforcement of those laws and ownership concentration on the demand for external finance and its availability. According to these authors, legal structures with little investor protection exacerbate information asymmetries and contracting costs. Hence, firms in such countries tend to have lesser access to capital and thus investment and economic growth are likely to be lower (e.g., Demircuc-Kunt and Maksimovic 1998; Jappelli, Pagano and Bianco 2005; Laeven and Majnoni 2005).

One common regularity that La Porta et al. (1997; 1998) point out is that common law countries tend to protect both shareholders and creditors the most; in contrast, French civil law countries tend to protect shareholders and creditors the least. They further highlight that

those countries which afford the strongest protection to investors are also characterized by well-developed financial markets which in turn affect the financing patterns of firms. This view was also corroborated by more recent studies including Djankov, La Porta, Lopez-de-Silanes and Shleifer (2008) and Fan et al. (2008) who remark that the law and its enforcement influences financing decisions as they are used to mitigate agency problems that exists between corporate insiders and outsiders, and thus, influence outsiders' confidence in the markets and consequently their development.

In terms of basic capital structure, La Porta et al. put forward that firms in common law countries would have greater debt than those in civil law countries as the severity of agency problem tends to be stronger in the former than the latter. Extending this notion, Demircug-Kunt and Maksimovic (1998) proffer evidence that firms in countries with stronger protection to investors and superior law enforcement tend to use long-term external finance. Furthermore, the dynamic adjustment literature suggests that adjustment costs should be lower and/or adjustment benefits higher in common law originated countries, leading to faster adjustment (e.g., Öztekin and Flannery 2008). In light of this backdrop, we note that five of the nine countries in our sample drew their legal systems from the English common law tradition whereas the other drew from the French civil law implying that the protection afforded to investors and the quality of their enforcement are likely to vary across our sample countries (see Table 1.1).

(Insert table 1.1 about here)

The literature alludes to the fact that the utility of contracts as vehicles to mitigate agency problems between insiders and outsiders to a firm is a function of not only the laws written in the books but also on the quality of their enforcement (e.g., Levine and Zervos 1998; Pistor, Raiser, Gelfer and Square 2000; Fabbri 2001; De Jong et al. 2008; Fan et al. 2008). However, in practice, there are varying degrees of disparity between the laws in the

books (*de jure*) and laws in action (*de facto*) and this is more pronounced when it comes to Africa as all African countries have adopted (or “transplanted”) their laws from some Western origins (Berkowitz et al. 2003). Thus, I find it imperative to investigate the influence of investor protections granted in the laws as well as the quality of their enforcement on financing decisions of firms in Africa. In the ensuing paragraphs, I explore creditor rights protection, shareholder rights protection, and quality of law enforcement in Africa with special emphasis on the sample countries⁴.

The important role that creditor rights protection plays in mitigation of the agency problem that exists between insiders and outsiders was recognized in La Porta et al. and other subsequent works. These authors devised an index to measure the degree of creditor rights protection in a country by considering such factors as restrictions on debtors, automatic stay on debtor’s assets, priority rights upon liquidation of a bankrupt firm and retention of administration by management of a firm to be restructured. Through its effect on the risk that lenders and borrowers face and agency costs, creditor rights protection has a bearing on basic capital structure as well as debt maturity structure (e.g., La Porta et al. 1998; Deesomsak et al. 2004, 2009; Cheng and Shiu 2007; Fan et al. 2008). In terms of capital structure adjustment speed, the literature suggests that firms in countries with stronger creditor rights protection tend to adjust their capital structure more quickly than those in countries with weaker creditor rights protection (e.g., Wanzenried 2006; Clark, Francis and Hasan 2009).

We note that the empirical literature proffers mixed evidence on the association between creditor rights protection and capital structure (e.g., Deesomsak et al. 2004; Cheng and Shiu 2007; De Jong et al. 2008). In terms of debt maturity structure, Deesomsak et al. (2009) show that firms in countries with superior creditor rights use relatively more short-term debt. In a related study, Qian and Strahan (2007) examine the influence of differences in

⁴ The exact definitions of creditor rights protection, shareholder rights protection, and quality of law enforcement and how the corresponding indices were calculated is indicated in notes to the tables presented at the end of the chapter.

legal systems on the terms of bank loans and find that higher creditors' rights indices are associated with lower interest rates and longer maturities. Using dynamic adjustment models, Öztekin and Flannery (2008) document that adjustment is faster in countries with stronger creditor rights protection. Although we note that the average creditor rights index for our sample countries was not varying over the 10-year period considered in the study, we observe that it varies from a low of zero (0) in Tunisia to a high of four (4) in Kenya and Nigeria (Table 1.1) suggesting a potential for cross-country variation in financing decisions of firms in sample countries stemming from differences in creditor rights protection.

Creditors aren't the only providers of capital to the firm. Shareholders are also important contributors to external funds and the extant literature alludes to the fact that firm financing is also a function of the quality of shareholder rights protection. It suggests that stronger shareholder rights protection reduces severity of agency costs between shareholders and other stakeholders, and hence encourages development of equity markets and utilization of long-term debt by firms (e.g., La Porta et al. 1998; Cheng and Shiu 2007; Fan et al. 2008; Deesomsak et al. 2009). This literature also develops an index to measure the degree of shareholder rights protection by considering such important factors as restrictions on mailing proxy votes, restrictions on whether shareholders have to deposit their shares prior to a general shareholders meeting, restriction on representation of minorities on the board of directors, mechanisms to handle oppressed minorities, requirements for calling an extraordinary shareholders' meetings and pre-emptive rights.

Shareholder rights protection, through its influence on agency costs and access to capital, does matter in the basic capital and debt maturity structure decisions of a firm. The empirical evidence is inconclusive though (e.g., Chen, Lee and Kao 2000; De Jong et al. 2008; Deesomsak et al. 2009). Although we note that the shareholder rights protection index was stable for our sample countries over the 10-year period considered (Table 1.2), it varies

from a low of two (2) in Kenya and Morocco to a high of five (5) in Ghana and South Africa (Table 1.1). This suggests that there could be variations in financing decisions of sample firms arising from differences in shareholder rights protection across sample countries.

Better law enforcement is likely to dis-incentivize engagement in risky behaviour by insiders, and hence, reduce the possibility of firms going into financial distress (e.g., Gul 2001; De Jong et al. 2008). Efficient law enforcement also enhances the creditor's ability to recoup money it lent to debtors, and hence, enhances the development of debt markets. Hence, firms that operate in a country where there is stronger law enforcement tend to have higher leverage (e.g., De Jong et al. 2008). However, Fan et al. (2008) argues that quality of law enforcement and the probability of debtholders to be expropriated by insiders are inversely related as there won't be willing lender if the quality of law enforcement is poor. Thus, firms in such environment tend to use more equity than debt and hence, less leverage. With regard to debt maturity structure, one could argue that since short-term debt is more difficult to expropriate, firms in countries with poor law enforcement are likely to issue more short-term debt than long-term debt (e.g., Fan et al. 2008; Deesomsak et al. 2009). In terms of dynamic capital and debt maturity structures, the literature suggests that firms located in countries with stronger law enforcement adjust their capital and debt maturity structures relatively quickly to the optimum.

Empirical evidences by De Jong et al. (2008) and Antoniou et al. (2008) show a negative association between the quality of a country's legal enforcement and firm leverage while those by Demirgüç-Kunt and Maksimovic (1999), Fan et al. (2008) and Deesomsak et al. (2009) report a positive association between debt maturity and quality of law enforcement. Berkowitz et al. (2003) developed a time varying index of the quality of law enforcement in a given country called "legality index" using a weighted average of legality variables introduced by La Porta et al. (1997; 1998; 2000). Nonetheless, our study covers periods

outside the period for which this index is calculated and some of the countries in our sample don't have their legality indices computed. Hence, this study uses a more or less similar index called "rule of law" computed by Kaufmann et al. (2009) as a time varying measure of quality of law enforcement. We note that the rule of law index for our sample countries varies not only over time (from a low of -0.125 to a high of -0.030) but also across countries (from a low of -1.31 in Nigeria to a high of 0.85 in Mauritius). These cross-country and temporal variations in the rule of law variable might have partly caused the variations in financing decisions of firms in our sample.

1.2.2 Financial institutions

Prior to the advent of the "law-and-finance" literature, a more conventional comparison of corporate governance systems focused on the institutions that provide capital to firms than the legal protections to investors. This prior literature which sometimes is referred to as the "financial-orientation" literature bifurcates corporate governance systems into "bank-centred" and "stock market-centred" corporate governance systems (e.g., La Porta et al. 1999; Song and Philippos 2004). The "financial-orientation" literature contends that financing patterns "fit" the governance system in the sense that those to whom the governance system gives most power to influence the policies of corporations would also be the main providers of funds (e.g., Hackethal and Schmidt 2004; Antoniou et al. 2008; Lopez-Iturriaga and Rodriguez-Sanz 2008).⁵ In this sub-section, the thesis explores the degree of financial deepening in African countries with particular emphasis on sample countries.

The relatively better access to equity funds and reduction in earnings volatility due to ample diversification opportunities enjoyed by firms in countries with developed stock markets may entice such firms into using more equity than debt. In the contrary, the reduced

⁵ Although Mayer (1988, 1990) suggests that there is no correspondence between a firm's financing pattern and corporate governance system, this view is a considered anomalous and Mayor's work was criticized on methodological and conceptual grounds.

information asymmetry and agency problems that epitomize developed stock markets may result in increased borrowing opportunities to deficit units leading to more leverage. The reduction in these problems may as well make lending to publicly held firms less risky and hence firms in such countries may tend to use more long-term debt (e.g., Demirgüç-Kunt and Maksimovic 1999; Wanzenried 2006; Cheng and Shiu 2007; Deesomsak et al. 2009). Furthermore, the likely smaller transaction costs and reduced agency costs associated with developed stock markets would mean that firms find it easier to adjust their capital and debt maturity structures to a target (e.g., Grossman and Stiglitz 1980; Demirgüç-Kunt and Maksimovic 1999; Wanzenried 2006; Clark et al. 2009). Also, the better financial flexibility and lesser financial constraint that firms operating in countries with developed stock markets are likely to experience should make it easier for them to adjust their capital and debt maturity structures toward the target (Flannery and Hankins 2007).

The empirical literature on the relationship between stock market development and basic capital structure is inconclusive. While Cheng and Shiu (2007) report, *albeit* definitionally sensitive, a significantly positive association between the two variables, Song and Philippatos (2004) find a significantly negative association. Similarly, Demirguc-Kunt and Maksimovic (1999) and Deesomsak et al. (2009) report that the nexus between stock market development and debt maturity structure is sensitive to the level of development of the country in which a firm operates.

In Africa, the financial landscape has changed with the growth of stock markets and the banking sector. The continent now has over 20 stock exchanges with varying stages of development as measured by liquidity (turnover), value traded, market capitalization, and number of listed firms⁶. Table 1.2 presents a descriptive summary of the various measures of stock market development by country and by period. We note that sample countries' stock

⁶ While the definition of each measure of stock market development is presented in the notes to the tables, a fairly detailed discussion on the profile of African stock exchanges can be found in Gwatidzo (2009).

exchanges are at different stages of development. For example, the market capitalization of South Africa was almost 17 times that of Tunisia, roughly twelve times that of Ghana and Nigeria, seven times that of Botswana and Kenya, five times that of Mauritius and Morocco, and four times that of Egypt. On the other hand, whereas the number of listed domestic companies showed a generally declining trend, turnover and total value of stocks traded ratios had increased over the sample period. This cross-country and temporal variation in stock market development suggests a possibility for potential variation in financing decisions of sample firms stemming from variations in stock market development of sample countries.

(Insert Table 1.2 here)

Banks have the advantage of economies of scale in screening, monitoring, and controlling borrowers, and hence, reduce costs related with information asymmetry, agency, and bankruptcy. The literature suggests that firms in countries where the weight of the banking sector is heavier than the stock exchanges are likely to have more debt in general and longer-term debt in particular (e.g., Demirgüç-Kunt and Maksimovic 1999; Chui, Lloyd and Kwok 2002; Wanzenried 2006; Cheng and Shiu 2007; Deesomsak et al. 2009). As in developed stock markets, developed banking sector is expected to reduce transaction and agency costs, reduce financial constraints and enhance financial flexibility of firms, and hence, increase adjustment speed of firm's financial structure to a target (Flannery and Hankins 2007).

The figures in Table 1.2 indicate that the banking sectors of sample countries were not only at different stages of development but also had been evolving during the 10 years period⁷. For example, the ratio of domestic credit to the private sector to GDP of South Africa, on average, was 10 times that of Ghana and Nigeria, eight times that of Botswana,

⁷ While the definition of each measure of banking sector development is presented in the notes to the tables, Fry (1995) has a detailed discussion on the advantages and disadvantages of the various measures of banking sector development. Also, Gwatidzo (2009) presents an elaborate discussion on the profile of the banking sector of five of the nine countries in our sample.

five times that of Kenya, and almost twice that of Mauritius suggesting that higher income countries tend to have deeper financial systems. We also note that domestic credit to the private sector to GDP and liquid liabilities to GDP – both measures of banking sector development – have increased significantly over the sample period. In summary, these variations in the banking sector development might have bearings on the financing decisions of our sample firms.

1.2.3 Macroeconomic conditions

The literature also has long recognized the macroeconomic context in which a firm operates as an important factor in the determination of firm's financing decisions. Studies by Singh and Hamid (1992) and Singh (1995), although criticized on methodological and empirical grounds (e.g., Cobham and Subramaniam 1998), suggest that firms in developing countries are less levered than their counterparts in the developed world. In terms of debt maturity structure, Fan et al. (2008) and Deesomsak et al. (2009) suggest that firms in less developed countries tend to use far less long-term debt than firms in more developed countries.

On the other hand, the extant literature also points out that there is a correlation between the growth rates of individual firms and the growth rate of the economy as the latter is seen as a proxy for the investment opportunity set faced by firms (e.g., Smith Jr and Watts 1992; Demircuc-Kunt and Maksimovic 1998; 1999; Beck, Demircuc-Kunt and Maksimovic 2002). And hence, economic growth is usually taken as an indicator of the financing needs of firms (e.g., Wanzenried 2006). I also expect that the potential for increased financial flexibility and reduced financing constraints likely to be experienced by firms at times of economic growth should make it easier for firms to adjust their financial structure to a target.

Taxation has been recognized as another macroeconomic variable that affects financing decision of firms ever since the birth of capital and debt maturity structure research (e.g., Borio 1990; Fan, Titman et al. 2008). Many authors suggest that firms which operate in countries that assign a higher tax advantage to debt financing will tend to have higher debt in order to maximize the tax benefits of debt (e.g., Coates and Wooley 1975; Rajan and Zingales 1995; Booth, Dermirguc-Kunt et al. 2001; Cheng and Shiu 2007). On the other hand, Kane et al. (1985) argue that debt maturity is negatively associated with tax advantage of debt.

Inflation rate is usually considered as a proxy for a government's ability to manage the economy and it provides information about the stability of the currency in long-term contracting (Demirgüç-Kunt and Maksimovic 1999; Wanzenried 2006). On the one hand, higher inflation is expected to result in higher firm leverage because firms may switch to issuance of debt: (i) since the real value of debt declines under inflationary situations, and (ii) inflation enhances the real tax advantage of debt for firms (e.g., Taggart 1985; Frank and Goyal 2007a). On the contrary, higher inflation may well lead to lower firm leverage probably because equity, relative to debt, provides better protection against inflation for investors (e.g., Coates and Wooley 1975; Beck, Demirgüç-Kunt et al. 2002). In terms of debt maturity, as debt contracts are generally nominal contracts and high inflation, which is generally associated with high uncertainty about future inflation, may tilt lenders away from long-term debt (Fan, Titman et al. 2008; Deesomsak, Paudyal et al. 2009).

The macroeconomic conditions of our sample countries vary widely in terms of the size of economy, economic growth rates, highest corporate marginal tax rate, and inflation. Table 1.3 presents a descriptive summary of these variables with particular emphasis on the sample countries. We note that average marginal corporate tax rates in sample countries spanned from a low of 15.0 per cent (Botswana) to a high of 36.0 per cent (Egypt) while

average inflation rates spanned from a low of circa 1.7 per cent (Morocco) to a high of circa 17.9 per cent (Ghana) over the sample period (Table 1.3).

(Insert Table 1.3 here)

These variations in marginal corporate tax rates and inflation rates could be reflections of differences in the way governments manage the economy and the ability of local currencies to provide a stable measure of value to be used in long-term contracting. We also observe that income level of sample countries is diverse. It ranges from upper-middle-income countries (Botswana, Mauritius and South Africa) to lower-middle-income (Egypt, Morocco, and Tunisia) to low-income countries (Ghana, Kenya and Nigeria). Table 1.3 also indicates that gross domestic product and its growth rates vary considerably across sample countries confirming the existence of disparity in the wealth of sample countries.

1.3 Problem Statement

It is widely accepted that industrial, institutional and macroeconomic factors are important in determining basic capital and debt maturity structure decisions of firms. Although we know that African economies are characterized by relatively inefficient and incomplete capital markets, noticeably higher information asymmetry, more severe agency problems and somehow different financing arrangements compared to advanced economies (e.g., Eldomiaty 2007; Ncube 2007); we are yet to witness a research that directly examines the role of financial and legal institutions on capital and debt maturity structure decisions in the context of African firms⁸. Understanding the role of financial and legal institutions on basic capital and debt maturity structure decisions of a firm is important because access to

⁸ Of course, Gwatidzo and Ojah (2009) did investigate the determinants of corporate capital structure of firms in five selected countries in Sub-Saharan Africa; however, this research does not venture into directly examining the role of institutional, macroeconomic, and industrial factors on capital structure decisions of a firm.

finance is partly a function of these institutions and access to finance in turn is expected to promote investment and growth.

The literature also points to the importance of industry factors such as operating characteristic, industry financing norms, nature of assets and technology, and industry risks in the determination of a firm's financial decisions (e.g., MacKay and Phillips 2005; Antoniou et al. 2008). However, to our knowledge, there is virtually no empirical work that focuses on inter-industry variation in the financing decisions of firms within the context of Africa. As in other developing countries, African governments sometimes institute policy interventions to foster investment in certain sectors/industries by way of subsidies and directed credit. Comprehending the place of industry factors on financing decisions of a firm is crucial for the purpose of crafting appropriate policy interventions.

Lately, research on basic capital structure has rather taken what could arguably be called a very fruitful leap in discriminating between two major theories of capital structure – trade-off theory and information asymmetry theory. The most salient outcome of these research effort is evidence that there is a substantial dynamic component in a firm's financing decisions and that the dynamism depends on firm, industry, macroeconomic and institutional factors (e.g., Drobetz and Wanzenried 2006; Drobetz et al. 2007; Flannery and Hankins 2007; Deesomsak et al. 2009; Terra 2011). However, there is no published work that investigates the dynamic adjustment of a firm's basic capital and debt maturity structures. Carrying out a similar research within the context of African economies will serve as an “out-of-sample” test for financial theories developed in the heavily studied Western economies. The purpose of this study is to fill these gaps in the literature by examining the role of firm, industrial, institutional and macroeconomic factors in financing decisions of a firm within the African setting.

1.4 Research Questions (RQs) and Objectives (ROs)

This study seeks to obtain answers to the following research questions:

- RQ1: Can the stylized relations between basic capital structure and several firm, industry, institutional and macroeconomic variables obtained from the literature be generalized to firms in African economies?

Chapter 2 attempts to track down empirical answers to RQ1 by extending the work of Gwatidzo and Ojah (2009) through inclusion of additional variables into the models (i.e., industry, institutional and macroeconomic variables) and civil law countries into the sample and use of better econometric procedures (i.e., the present study, in addition to the basic estimation procedures for panel data regression, uses system-GMM and Seemingly Unrelated Regression procedures which handle data endogeneity problems for the purpose of robustness check).

- RQ2: Can the stylized relations between debt maturity structure and several firm, industry, institutional and macroeconomic variables obtained from the literature be generalized to firms in African economies?

The work in chapter 4 is a first attempt to provide an empirical response to RQ2. By identifying important firm, industry, institutional and macroeconomic antecedents of debt maturity structure, the chapter presents insights for governments, policymakers and other stakeholders for crafting policy and legislative intervention that promote access to long-term finance.

- RQ 3 Does the basic capital structure of firms in African economies adjust toward a target level? If so, what firm, industry, institutional and macroeconomic

variables determine the adjustment speed?

Lately, the extant literature witnessed proliferation of both theoretical and empirical effort addressing RQ3 within the context of advanced economies. However, it remained behind the curve when one considers the African setting. Chapter 3 is a first attempt to lift the debate on basic capital structure in Africa up-to-par with similar debates elsewhere and as such it challenges African governments, policymakers and other stakeholders to enact policies that enhance benefits and/or reduce costs of adjusting capital structure of a firm toward the optimum.

- RQ 4 Does the debt maturity structure of firms in African economies adjust toward a target level? If so, what firm, industry, institutional and macroeconomic variables determine the adjustment speed?

Although both theoretical and empirical literature on adjustment speed of basic capital structure has taken a significant step forward, we haven't seen similar leaps in relation to debt maturity structure; virtually none to my knowledge. By drawing lessons from the literature on basic capital structure and applying dynamic specification with robust estimation procedures on data drawn from nine African countries, the work in chapter 5 attempts to proffer empirical answers to RQ4 and also presents policy recommendations.

To proffer answers to the foregoing questions, the thesis is set out to attain the following main research objectives:

- RO 1: Examine the influence of firm, industry, institutional and macroeconomic-factors on a firm's basic capital structure decision within the context of nine African countries.

- RO 2 Investigate the effect of firm, industry, institutional and macroeconomic factors on a firm's debt maturity structure decisions within the context of nine African countries.
- RO 3 Assess the role of institutional, macroeconomic, industry and firm characteristics on the adjustment speed of basic capital structure within the context of nine African countries.
- RO 4 Examine the role of institutional, macroeconomic, industry and firm characteristics on the adjustment speed of corporate debt maturity structure within the context of nine African countries.

It is not uncommon to find a list of hypotheses in empirical, especially quantitative, studies of this nature. Given that the study dealt with relatively large number of variables, presenting a roll coaster of hypotheses would have made reading the thesis an unpleasant engagement. However, all of the hypotheses are directly and clearly implied in the econometric models presented in the 'Empirical Framework' sections of each chapter. Thus, with a view to enhance readability, we opted not to have the hypotheses listed separately.

1.5 The Research Paradigm, Approach and Design

1.5.1 The Research Paradigm

We seldom find explicit discussions of the philosophical issues of worldviews or paradigms in the financial economics literature (e.g., Schmidt 1982; McGoun 1992; Ryan, Scapens and Theobald 2002:7-116)⁹. Nonetheless, Guba and Lincoln (1998:201) note that inquiry paradigms define the researcher's legitimate limits of inquiry and are derived from

⁹ The only exceptions to this are Friend (1973); McGroun (1992); Bettner et al. (1994); Frankfurter (1994, 2002); and Ardalan (2003a, b, and c).

the answers to ontological, epistemological and methodological questions. These authors remark that if a researcher doesn't have a specific paradigm, his/her research lacks orientation and criteria of choice, and hence, all problems, all methods, and all techniques are equally legitimate. By contrast, a paradigm provides a researcher not only with a map but also with some of the directions essential for mapmaking. In learning a paradigm, a researcher acquires theory, methods and standards together, usually in an inextricable combination (Corbetta 2003:10). Thus, just for the purpose of pointing out the paradigmatic footing of the present study, I find it important that the paradigm that underpins this research is explored.

The literature on social theory and organizational analysis identifies four different paradigms based on synthesis of the nature of social science research and the nature of society¹⁰: functionalist view, interpretivist view, radical humanist view and radical structuralist view (Burrell and Morgan 1979 cited in Ardalan 2003a, 2003b, 2003c; Hassard 1991). For the purpose of better understanding the particular paradigm which underpins this study, in what follows, I present a very brief discussion of Burrell and Morgan's (BM's, henceforth) four classes of paradigms and their corresponding assumptions below¹¹:

1. The functionalist paradigm is based on the assumption that: society is real and concrete; it is aimed at consensus and compromise; social science is objective and value free; the researcher is independent of the object of research; the goal of the researcher is to find the orders that prevail within the phenomenon being studied. Functionalists assume that properties of aggregates are determined by properties of its units.

¹⁰ Different authors in the social theory and methodology literature follow slightly different ways of classifying paradigms. This thesis follows Ardalan (2003a) and uses the word "paradigm" as a synonym for "worldview".

¹¹ The discussion on research paradigms was intentionally kept to the minimum as its purpose was just to proffer the paradigmatic footing of the present study. More elaborate discussions on the subject could be found in the philosophy of science literature including, but not limited to, the works of Imre Lakatos (1970), Thomas Khun (1962), Karl Popper (1959;1972), Martin Heidegger (1962).

2. The interpretivist paradigm is based on the assumption that: social reality doesn't exist outside the 'individual's constructions'; however, it is aimed at consensus and compromise; the phenomenon being studied and the researcher are not necessarily independent; the goal of the interpretive researchers is to find how the subjective orders that prevail within the phenomenon under consideration are created, sustained, and altered. Interpretivists assume that properties of individual units can be obtained through an understanding of the properties of the whole.
3. The radical humanists paradigm is based on the assumption that: reality is socially created and sustained; it is aimed at contention and domination; the phenomenon being studied and the researcher are not necessarily independent; the perception of human beings is dominated by the ideological superstructures of the social system; the goal of the radical humanist researcher is to find the way ideological dominance of the social system occurs and finding ways in which human beings can release themselves.
4. The radical structuralist worldview is based on the assumption that: reality is objective and concrete; it is aimed at contention and domination; the researcher is independent of the object of research. Radical structuralism assumes that totality shapes and is present in all its constituent parts.

Needless to say, there are also so many other authors who wrote on the issue of paradigms including Guba and Lincoln (1998:201-208); Corbetta (2003:10); and Neuman (2005:60) but the thesis limits itself to BM's four classification of paradigms for these are the ones which attracted the most attention in financial economics research (Bettner, Robinson and McGoun 1994).

Bettner et al. (1994) note that present day finance research is based on a worldview that assumes: there is a cause and effect mechanism underlying all financial behaviour (ontology); society has certain unassailable rules that researchers can discover (epistemology); the rules are set by voluntary consensus (human nature); and knowledge about finance is quantifiable and stable and can be acquired through observation and measurement (methodology). Hence, Bettner et al. write that present day academic finance research is based on functionalist paradigm which is embedded in the tradition of positivism. This view, indeed, is shared by other authors including McGoun (1992); Frankfurter and McGoun (1999); Ardalan (2002); and Ardalan (2003a, 2003b, 2003c).

This thesis adopts the dominant paradigm - the functionalist paradigm - which treats the world of finance as a place of concrete reality where the individual's behaviour is determined by the external environment (e.g., McGoun 1992; Frankfurter and McGoun 1999; Ardalan 2003a, 2003b). This choice is made because the current study aims at examining whether the "conventional" factors identified in the literature also influence financing decisions of African firms. Thus, it is conceived on the basis of a worldview that there are universally valid patterns, governing principles and rules, and explanations for financing decisions of firms. By contrast, the interpretive paradigm assumes that there are no universally valid rules of finance and financial management. As a result, this study is a misfit for an interpretive paradigm. Researches based on radical humanist and radical structural paradigms are just non-existent (Bettner et al. 1994; Ardalan 2003b).

1.5.2 The Research Approach

The choice of a suitable research approach¹² is not something to be made in the abstract. It should be aligned with the researcher's assumptions about the nature of the phenomenon being studied, the nature of knowledge, and methods through which knowledge can be obtained (e.g., Ardalan 2003c). Contingent upon these assumptions, a researcher may adopt either a quantitative or a qualitative approach to the study problem at hand. Bettner et al. (1994); Guba and Lincoln (1998:208); and Gliner and Morgan (2000:8) write that the quantitative approach is based on positivism and, hence, is based on a belief that all phenomena can be reduced to empirically observable truth; there is only one truth, an objective reality that exists independent of human perception; the investigator and investigated are independent entities. Denzin and Lincoln (1998:10-11) add that the goal of quantitative approach to research is to measure and analyze causal relationships between variables within a value-free framework. This view is indeed shared by many others (e.g., Firestone 1987; Sarantakos 1994:41-42; Creswell 2003:19; Leedy and Ormrod 2005:232; Shields and Tajalli 2006; Neuman 2007:85) who observe that quantitative approach is suitable in situations where the researcher is interested in theory verification through testing of hypotheses.

In contrast, the qualitative approach to research relies upon interpretivism (Neuman 2007:85), and hence, is based on a worldview that there are multiple realities or multiple truths based on one's construction of reality; reality is socially constructed and sustained; there is no access to reality independent of our minds, no external referent by which to compare claims of truth; the researcher and the object of study are interactively linked so that findings are mutually created within the context of the situation which shapes the inquiry

12 The social research literature is not uniform in the use of the phrase 'research approach.' This thesis follows Sarantakos (1998), Creswell (2003), Neuman (2007), and Leedy and Ormrod (2005) and uses the phrase 'research approach' to mean 'research methodology' which is determined by the principles entailed in 'research paradigm.'

(e.g., Denzin and Lincoln 1994:10-11; Guba and Lincoln 1998:208). Denzin and Lincoln (1998:10) further add that the emphasis of qualitative research is on process and meanings.

Bettner et al. concedes that quantitative research dominates present day finance research. The present study uses the quantitative approach since its prime purpose is verifying whether capital and debt maturity structure theories developed in Western settings apply equally to financing decisions of African firms.

1.5.3 The Research Design

The thesis investigates the influence of institutional, macroeconomic, industry, and firm-specific factors on financing choices of African firms during the 10 years between 1999 and 2008. The inquiry was carried out with the intention of verifying relationships between variables to see whether mainstream capital and debt maturity structure theories are relevant to African firms. The study was ‘passive’ in that it didn’t involve manipulation of either the independent or the dependent variables; nor did it involve random assignment of units of analysis (i.e., firms, industries, countries, etc). Hence, it could appropriately be labelled as an *ex post facto* non-experimental design (e.g., Pedhazur and Schmelkin 1991:304; Creswell 2003; Leedy and Ormrod 2005:232; Welman, Kauger and Mitchell 2005:88).

Furthermore, for at least two reasons, it could be said that the principal object of this study was explanatory. First, in many respects, the theoretical framework in finance has reached a very high degree of sophistication, although the linkages between theory and empirical results have not always been well structured (Ryan et al. 2002:50). Thus, the research questions [and hypotheses] can be investigated under a well-developed structure that results from a long history of research with evolving theories (Kuhn 1962). As such, an explanatory or analytical design suits the topic. Second, the subject of financing decisions of firms has attracted quite enormous attention since the seminal work of MM (1958). Thus,

typical factors explaining firms' financing decisions are known and this study partly aims to examine the relevance of these explanations to the African setting.

1.6 Contributions of the Study

The scientific contributions of this study are fivefold. First, it directly investigates the influence of institutional and macroeconomic context on basic capital structure decisions of firms within the context of nine (9) selected African countries¹³. To our knowledge, this study presents a first attempt to directly examine the influence of a host of institutional and macroeconomic variables on capital structure decision of firms within the context of Africa¹⁴. Second, despite the proliferation of both empirical and theoretical works on the subject of capital structure choice, much less is known about debt maturity structure of firms (e.g., Stohs and Mauer 1996; Schiantarelli and Sembenelli 1997; Antoniou et al. 2006). This paucity is even worse when one considers the African literature. There is no published work within the context of the African continent on this subject and chapter 4 of this thesis provides an empirical insight into debt maturity decisions of firms in Africa in this regard.

Third, the literature has taken a new leap by considering a dynamic specification that allows for adjustment of basic capital structure (e.g., Antoniou et al. 2008). Apparently, there is no empirical work which looks at how institutional and macroeconomic contexts in Africa affect the way in which firms adjust their financial structure over time. Again, this study is a first attempt to investigate determinants of the adjustment speed of capital structure by using data from the African continent. Fourth, although the recent years have witnessed empirical work documenting that debt maturity structure of firms has a dynamic component (e.g.,

¹³ The selection of countries in the sample was essentially made based on: (i) existence of functioning stock markets; (ii) number of firms actively traded in the respective stock exchanges; and (iii) availability of complete data.

¹⁴ Chapter 2 of this thesis extends the work of Gwatidzo and Ojah (2009) by including additional variables (i.e., industry, institutional and macroeconomic variables) into the models, civil code countries into the sample, and employing better estimation procedures.

Antoniou et al. 2006); we haven't seen any published work that investigates the determinants of adjustment speed of debt maturity structure yet. The work in Chapter 5 is a first attempt to identify the determinants of adjustment speed of debt maturity structure. Fifth, despite the fact that there is a long tradition of examining industry effects on financing decisions of firms (e.g., MacKay and Phillips 2005; Antoniou et al. 2008); the African literature on the subject apparently disregarded this important variable¹⁵. The present study includes industry variables into its model specifications, and hence, provides additional insights into firm finance research.

1.7 Significance of the Study

The significance of the present study is twofold. First, it is a first attempt to proffer evidence on the influence of institutional, macroeconomic and industry variables on the dynamics surrounding basic capital and debt maturity structure of a firm within the context of Africa; it adds additional insight into corporate finance theory and practice. In fact, the Chapter that deals with the adjustment speed of debt maturity structure is arguably new even in the international literature. Second, the findings of this research are very crucial to better understand the institutional and macroeconomic policies that would create an enabling environment for investment and growth. Governments in African economies have high propensities to intervene in the functions of financial and legal institutions especially through directed lending where they identify so-called strategic sectors and allocate to them cheap funds for investment (Gwatidzo 2009: 202-234). In this regards, we envisage interest by people in governments and other policy making spheres in the findings of this research.

¹⁵ A pilot study co-authored by the writer (Lemma and Negash 2011) within the context of South Africa shows that industry effect is, in fact, the strongest determinant of capital structure decisions among South African firms.

1.8 Organization of the Thesis

This thesis is made up of six chapters. By way of introduction, the first chapter proffers a background to the study; overview of the institutional and macroeconomic environment that characterizes the sample countries; problem statement, questions and objectives of the research; the paradigm, approach, and design of the research; and, finally, contributions and significance of the study. The introductory chapter is followed by four standalone but highly related chapters based on four academic papers submitted for publication in peer-reviewed journals. The papers are being scrutinized by reviewers of the journals. Given that the study was purposely designed to produce standalone empirical papers in Chapters 2, 3, 4 and 5, it was found necessary to include brief reference to the relevant background literature in each of the chapters, thereby inevitably leading to some limited amount of duplication. However, the repetition has been kept to the strictest minimum.

In chapter 2, the thesis looks into the determinants of basic capital structure decisions of a firm. It, specifically, examines the role of “conventional” firm, industry, institutional and macroeconomic factors on basic capital structure decisions of a firm within the context of nine (9) African economies. Using a range of econometric procedures, the chapter documents evidence that corroborates mainstream capital structure theory and other interesting patterns. An article based on this chapter is being reviewed for possible publication in a peer-reviewed journal.

Chapter 3 extends the debate on basic capital structure to the next level by considering a dynamic adjustment model. It, particularly, investigates the data if firms adjust their capital structure toward a target, and if so, what firm, industry, institutional and macroeconomic factors influence the pace with which firms adjust their capital structure within the context of the Nine (9) African countries. An academic paper based on this chapter is being reviewed for possible publication in a peer-reviewed journal of international standing.

In chapter 4 we examine the role that “conventional” firm, industry, institutional, and macroeconomic factors play in the determination of debt maturity structure. After subjecting the data to a range model specifications and battery of estimation procedures for robustness check, we chronicle the influence of “conventional” factors on debt maturity structure decisions of a firm within the context of African economies. An article based on this chapter is accepted for publication in the Journal of Business and Policy Research.

Although the recent literature enjoyed a massive leap in terms of investigating the adjustment speed of basic capital structure of a firm toward a target, we are yet to witness similar research with regard to debt maturity structure. In chapter 5, we extend the debate on debt maturity structure by considering a dynamic adjustment modelling. We specifically examine if firms adjust their debt maturity structure, and if so, what firm, industry, institutional, and macroeconomic factors influence the pace with which a firm adjusts its debt maturity structure within the context of the nine African countries included in the sample. A paper based on this chapter is being considered for publication in a peer-reviewed journal. Chapter 6 proffers the main insights and conclusions drawn from the entire work and also highlights potential areas for future research.

Table 1.1 Summary of legal institutions and their evolution**Panel A: Descriptive Summary of Legal Institutions**

Country	Creditor Rights	Shareholder Rights	Rule of Law	Origin
Botswana	3.00	3.50	0.62	1.00
Egypt	2.00	3.00	-0.04	0.00
Ghana	1.00	5.00	-0.10	1.00
Kenya	4.00	2.00	-0.95	1.00
Mauritius	2.25	3.50	0.85	0.00
Morocco	1.00	2.00	-0.03	0.00
Nigeria	4.00	4.00	-1.31	1.00
South Africa	3.00	5.00	0.12	1.00
Tunisia	0.00	3.00	0.20	0.00

Notes: All the figures, except those for the origin variable, are averages for the 10 year period considered in the study. The values for the origin variable are fairly stable and a value of 1 is assigned to countries whose laws were adapted from English common law and 0 is assigned to those whose laws were adapted from the French civil law.

Panel B: Evolution of the Legal Institutions in Sample Countries**

Year	Creditor Rights	Shareholder Rights	Rule of Law
1999	2.384	3.550	.
2000	2.384	3.550	-0.077
2001	2.384	3.550	.
2002	2.384	3.550	-0.102
2003	2.384	3.550	-0.125
2004	2.384	3.550	-0.036
2005	2.384	3.550	-0.030
2006	2.384	3.550	-0.099
2007	2.384	3.550	-0.119
2008	2.384	3.550	-0.100
Overall	2.384	3.550	-0.086

****** All figures are averages of all countries in the sample.

Notes: "Creditor rights" refers to an index aggregating creditor rights following La Porta et al. (1998). A score of one is assigned when each of the following rights of secured lenders is defined in laws and regulations: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. Second, secured creditors are able to seize their collateral after the reorganization petition is approved, i.e. there is no "automatic stay" or "asset freeze." Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Finally, if management does not retain administration of its property pending the resolution of the reorganization. The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights) and is constructed as at January for every year from 1978 to 2003. "Shareholder rights" refers to an index of anti-director rights following La Porta et al. (1998) computed by adding one when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders= Meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders= Meeting is less than or equal to ten per cent (the sample median); or (6) when shareholders have pre-emptive rights that can only be waived by a shareholders meeting. The range for the index is from zero to six. "Rule of law" refers to an index measuring the extent to which agents have confidence in and abide by the rules of society. It includes several indicators such as perceptions of the incidence of crime, the effectiveness, and predictability of the judiciary, and the enforceability of contracts. "Origin" refers to a dummy variable that identifies the legal origin of the Company law or Commercial Code of each country. Dummy variable equal to one if common law and equal to zero otherwise. The data for these variables were obtained from World Bank Development Indicators.

Table 1.2 Summary of financial institutions and their evolution**Panel A: Descriptive Summary of Financial Institutions***

Country	Domestic Credit	Liquid Liabilities	Number of Listed Companies	Market Capitalization	Total Value Traded	Turnover Ratio
Botswana	17.32	30.11	17.50	27.01	0.78	3.21
Egypt	58.48	95.73	828.10	53.74	16.91	32.97
Ghana	13.59	29.38	27.30	16.56	0.45	3.07
Kenya	26.60	39.91	52.80	25.79	2.11	7.35
Mauritius	70.35	98.75	45.60	42.15	2.30	6.65
Morocco	52.99	84.04	59.50	44.57	8.91	18.76
Nigeria	14.83	21.51	202.60	17.88	2.25	14.05
South Africa	137.96	47.14	474.10	201.47	81.65	48.02
Tunisia	65.92	59.92	46.40	12.00	1.61	14.87

* All the figures are averages for the 10 year period considered in the study.

Panel B: Evolution of the Financial Institutions in Sample Countries**

Year	Domestic Credit	Liquid Liabilities	Number of Listed Companies	Market Capitalization	Total Value Traded	Turnover Ratio
1999	46.07	50.48	260.63	44.53	9.36	11.93
2000	46.59	50.89	259.38	35.94	9.50	12.50
2001	47.76	51.96	254.50	30.09	8.81	11.59
2002	44.43	53.17	248.38	38.53	9.86	17.39
2003	46.90	55.38	222.63	42.93	9.15	12.26
2004	48.86	55.50	198.63	54.92	11.54	13.21
2005	50.33	62.66	192.38	62.43	15.75	16.19
2006	53.35	59.71	176.63	78.92	24.71	22.00
2007	63.02	67.40	166.75	94.54	31.09	24.45
2008	-	-	154.50	-	-	26.10

** All figures are averages of all countries in the sample.

Domestic credit refers to the ratio of private credit to GDP. Liquid liabilities refers to the ratio of liquid liabilities of financial intermediaries to GDP. Number of listed companies refers to the total number of domestic companies listed in stock exchanges of a country. Market capitalization refers to the number of listed shares times their price as a percentage of GDP. The total value traded refers to the total value of shares traded divided by GDP. Turnover ratio refers to the ratio of value of shares traded divided by the market capitalization.

Table 1.3 Summary of macroeconomic conditions and their evaluation**Panel A: Descriptive Summary of Macroeconomic Variables***

Country	Taxation	Inflation	Size of overall Economy	Growth rate of Real GDP	Income Group
Botswana	15.00	8.26	3.60	4.40	UMI
Egypt	36.00	5.38	3.20	2.91	LMI
Ghana	29.90	17.93	2.43	2.82	LI
Kenya	30.30	8.82	2.62	1.15	LI
Mauritius	23.00	6.03	3.62	3.36	UMI
Morocco	35.00	1.66	3.17	2.93	LMI
Nigeria	25.00	11.76	2.61	2.92	LI
Tunisia	31.34	2.92	3.35	3.93	LMI
South Africa	29.50	5.31	3.51	2.53	UMI
	21.06	6.38	2.38	2.39	NA

* All the figures, except for the income group variable, are averages for the 10 year period considered in the study.

Panel B: Evolution of the Macroeconomic Conditions in Sample Countries**

Year	Taxation	Inflation	Size of Economy	Growth of Economy
1999	35.108	4.098	3.188	2.332
2000	34.985	4.213	3.199	2.621
2001	34.985	4.821	3.206	1.677
2002	34.985	5.363	3.210	1.034
2003	34.863	5.797	3.220	2.206
2004	34.863	8.252	3.233	3.202
2005	34.863	5.530	3.246	2.980
2006	34.531	7.001	3.266	4.609
2007	23.404	8.021	3.285	4.592
2008	23.404	NA	NA	NA
Overall	32.599	5.899	3.228	2.806

** All figures are averages of all countries in the sample.

Notes: “Taxation” refers to the average of the highest marginal corporate tax rate (%) between 1999 and 2008. “Inflation” is the average of consumer price adjusted inflation rates. “Size of economy” denotes the average of the natural logarithm of gross domestic product per capita (constant 2000 US\$). “Growth economy” is the average of the annual percentage of GDP per capita growth between 1999 and 2008. “Income group” refers to World Bank’s grouping of countries based on GDP per capita where UMI refers to upper-middle-income countries, LMI refers to lower-middle-income countries, and LI refers to low-income countries.

CHAPTER 2

DETERMINANTS OF CAPITAL STRUCTURE OF A FIRM

2.1 Introduction

Capital structure research, arguably, is at the core of modern corporate finance. Cross-country studies show that capital structure decisions hinge not only on firm-specific characteristics but also on the country's legal and market environment and macroeconomic conditions (e.g., Rajan and Zingales 1995; Beck et al. 2002; Antoniou et al. 2008; De Jong et al. 2008; Lopez-Iturriaga and Rodriguez-Sanz 2008). As previously hinted, understanding the role of these country contexts in capital structure decisions of firms is important both at macro- as well as micro-level (e.g., Singh and Hamid 1992; Prasad et al. 2001; Green et al. 2003).

The hitherto literature on the nexus between country milieu and capital structure decisions certainly advanced our understanding of firm's financing behaviour. Until recently, most empirical works were mainly skewed to advanced economies or, at best, non-African economies. There are profound institutional and macroeconomic differences between advanced and developing economies, however (e.g., Booth et al. 2001). Cognizant of this limitation, recent literature experienced small but growing strand of studies dealing with the subject of capital structure within the context of African economies¹⁶. Nevertheless, as most of these studies are single-country studies we could not know the influence of institutional and macroeconomic factors on the capital structure decisions of African firms. To our knowledge, empirical work that directly investigates the influence of institutional and

¹⁶ Mutenheri, E. and C. J. Green (2003) examine the impact of the economic reform programme on the financing choices of Zimbabwean listed companies. Yartey, C. A. (2009) investigates the effect of stock market development on the importance of debt relative to external equity in the balance sheet of Ghanaian firms. Abor, J. (2006) and Abor and Biekpe (2008) investigate the impact of firm characteristics on capital structure decisions within the context of Ghana. Negash, M. (2001, 2002) examine the association between taxes, debt, and capital structure. Toby, A..J., (2005) investigates the role of Nigerian banks in funding the short-term and long-term financing requirements of Nigerian quoted manufacturing enterprises.

macroeconomic contexts on capital structure decisions of African firms is virtually non-existent. Gwatidzo and Ojah's (2009) work apparently is the first cross-country study investigating capital structure decisions of a firm within the African setting. Although these authors report differences in capital structure of firms in their sample countries, they did not venture into directly examining how institutional and macroeconomic variables impact capital structure decisions of firms in their sample countries.

In this chapter, we attempt to examine the nexus between firm, industrial, institutional and macroeconomic factors, on the one hand, and basic capital structure, on the other, within the context of selected African countries. Such a study contributes to the existing literature in several ways. Firstly, to our knowledge, it is a first attempt to directly test the influence of institutional and macroeconomic variables on capital structure decisions of African firms. Secondly, as all of the sample countries in Gwatidzo and Ojah's (2009) study are common law countries, by including civil law countries, this chapter investigates fully the role of legal institutions in explaining the variations in basic capital structure of African firms.

Thirdly, although there is ample evidence that industry characteristics do matter in capital structure decisions of firms, we are yet to witness a study that examines inter-industry variations in capital structure decisions of African firms. This study, apparently, is a first attempt to document inter-industry variations in capital structure decisions of African firms. Fourthly, despite the fact that firm heterogeneity, firm and time effects, and endogeneity problems are typical issues that entangle finance research (e.g., Parsons and Titman 2007; Getzmann, Lang and Spremann 2010), empirical research on capital structure decisions of African firms choose to ignore these problems. This study, in addition to the usual methods, uses Generalized Method of Moments (GMM) and Seemingly Unrelated Regression (SUR) methods which are robust to these problems.

The empirical analysis focused on 10 years (1999 – 2008) data pertaining to a sample of 986 non-financial firms drawn from nine (9) African countries which have functioning stock exchanges. With a view to identify which set of factors are important determinants of basic capital structure, the chapter analyses the data using five sequentially ordered models. Firstly, it examines results for a baseline model (Model 1) which specifies basic capital structure as a function of firm characteristics. Secondly, it further examines if the results in Model 1 persist after controlling for industry effects (Model 2). Thirdly, it considers cross-country variations in capital structure by further including country dummies (Model 3). Fourthly, it introduces some broad measures of cross country differences (i.e., legal family and level of development) that are known to effect on capital structure (Model 4). Finally, it injects more specific and direct measures of institutional and macroeconomic conditions to see if such variables affect capital structure decisions of African firms (Model 5).

The chapter documents that firm size has a positive influence on leverage while firm profitability has an inverse influence on leverage. However, the nexus between asset tangibility, non-debt-related tax shield and dividend payout and leverage is dependent on how the latter is defined. The results also confirm the view that differences in industry characteristics lead to inter-industry variation in capital structure. Also, the chapter proffers evidence that income level of countries moderates the influence of firm-specific factors on capital structure decisions. Finally, the findings indicate that: (i) macroeconomic conditions (i.e., overall size of the economy, growth rate of real GDP per capita, inflation); (ii) legal institutions (i.e., shareholder and creditor rights protection and rule of law); and (iii) financial institutions (i.e., relative size of banking sector and stock market development) do matter in capital structure decisions of African firms.

The remainder of the chapter proceeds as follows: section 2 presents a brief review of the literature on capital structure. Section 3 develops the empirical setup for analyses. Section 4 presents the results and discussions and section 5 concludes.

2.2 Literature Review

2.2.1 Theories of capital structure

Ever since the ground breaking work of MM (1958), capital structure decisions of a firm became a subject of intense research. Nonetheless, there has been no one universal theory that explains the capital structure decisions of a firm. Rather, there are only conditional theories (e.g., Myers 2001). For the purpose of understanding the many and disperse theoretical contributions to explain the capital structure “puzzle,” we classify capital structure theories into two major groups: trade-off theory and information asymmetry theory. Of course such simplification in classifying capital structure theories is open to criticism, but our classification is ample enough to encompass theoretical work done so far, yet discriminating enough to point out the fundamental differences between each classification.

Arguments for the trade-off theory are based on the proposition that basic capital structure is determined by a trade-off between benefits and costs of debt. Two major theories may conveniently be clustered under trade-off theories - tax/bankruptcy trade-off and agency theories. The tax/bankruptcy trade-off theory views (e.g., Modigliani and Miller 1963; Kraus and Litzenberger 1973; Miller 1977; Kim 1978) the firm as setting (and moving towards) a target capital structure which involves a trade-off between benefits of debt (i.e., the advantage of tax deductibility of interest paid on debt or other non-debt-related tax-shields) and its costs (the costs of financial distress and personal tax expense debtholders incur) to arrive at a value maximizing capital structure (e.g., Graham and Harvey 2001). The works of DeAngelo and Masulis (1980); Bradley et al. (1984); Titman and Wessels (1988) and more recently in

Barclay and Smith (1999) and Fama and French (2002) were based on the tax/bankruptcy theory. The theory of agency, on the other hand, points to the potential conflict of interest between firm's stakeholders and conjectures that capital structure of a firm is the result of its financial manager trying to balance agency costs of debt against benefits of debt (e.g., Jensen and Meckling 1976; Harris and Raviv 1991; Myers 2001).

Another whole family of theories derives from the asymmetric information problems that exist between insiders and outsiders to a firm. The first of these is the pecking order theory, which suggests that a firm goes through a specific hierarchy of securities (i.e., first internal sources of funding, then debt financing and finally equity) in financing its investments. This pecking order explanation of capital structure is based on the argument that there are information asymmetries and transactional costs that a firm faces in raising capital (e.g., Myers 1984; Myers and Majluf 1984; Myers 2001)¹⁷. The works of Krasker (1986), Narayanan (1988), Heinkel and Zechner (1990), and Brennan and Kraus (1987) were broadly based on pecking order argument.

Also within the asymmetric information mind set, capital structure can be regarded as a tool used by a firm to credibly signal the superiority of its projects to the market (e.g., Ross 1977; Harris and Raviv 1991; Barclay and Smith 1999; Graham and Harvey 2001). The works of Leland and Pyle (1977), Bhattacharaya (1979; 1980), Heinkel (1982), and Glazer and Israel (1990) also extend this argument. Finally, market timing theory suggests that firms look at the current conditions in the securities market and time the raising of funds in accordance with the conditions in these markets. Thus, according to this theory, firms tend to raise funds from markets that currently look more favourable (e.g., Baker and Wurgler 2002). Advocates of this theory contend that capital structure is a cumulative outcome of past

¹⁷ In addition to information asymmetry and transaction costs, the potential dilution of 'voting control' is also presented as a justification for the pecking order theory, especially in the case of closed (or 'privately held') corporations.

attempts to time the equity market, thus, it is strongly related to historical market values of the firms' own securities.

Based on these theories, the literature identifies a number of firm-, industry-, and country-level factors that determine basic capital structure of a firm. However, neither theoretical predictions nor empirical results are uniform. Table 2.1 presents a summary of the theoretical predictions and empirical results.

(Insert table 2.1 about here)

2.2.2 Measuring basic capital structure

Similar to the competing theories, there is no universally accepted definition of capital structure in the literature. Researchers agree that measures of capital structure should vary depending on the purpose of analysis (e.g., Rajan and Zingales 1995; Bevan and Danbolt 2002). In addition, empirical studies show that different measures of capital structure produce different results, hence, can affect interpretation of results (e.g., Harris and Raviv 1991). Further, the competing theories have different implications for capital structure depending on how it is defined (e.g., Titman and Wessels 1988; Bhaduri 2002a, 2002b; Frank and Goyal 2007a). Accordingly, the literature emphasizes the importance of considering: (i) both short-term and long-term and (ii) market-based and book-based measures of capital structure.

Ostensibly, most studies do not use market based measures of capital structure since: (i) most theoretical predictions apply to book values (e.g., Fama and French 2002); (ii) book-based measures may better reflect management's target capital structure since market values of equity depend on a number of factors that often cannot be controlled by the firm; and (iii) market values of debt are often not available (e.g., Thies and Klock 1992). Many researchers report that the use of book value delivers similar results to market value as the two, as

Bowman (1980) demonstrates, are highly correlated. Further, information obtained from financial statements is more credible.

On the other hand, Welsh (2010) shows how the common use of financial-debt-to-asset (FD/A) ratio as a measure of leverage is fundamentally flawed. Mindful of all these, this and the next chapter employ three book-based measures of capital structure: short-term leverage (STL); long-term leverage (LTL); and total leverage (TL). In what follows, the thesis assesses the literature on the nexus between firm, industry, institutional and macroeconomic factors, on the one hand, and basic capital structure, on the other.

2.2.3 Firm characteristics and basic capital structure

The capital structure literature considers firm-specific factors as proxies for tax advantages, agency costs, bankruptcy costs, and information asymmetries and analyses their role in the determination of firm leverage (e.g., Antoniou et al. 2008). Consistent with the literature, this study includes a set of firm level variables that capture factors that are known to effect on capital structure. These variables include earnings volatility, firm size, profitability, growth opportunities, asset tangibility, dividend payout and tax-shield.

The literature suggests that earnings volatility impacts capital structure of a firm since it represents a firm's probability of financial distress and also Myers and Majluf's (1984) underinvestment problem (e.g., Deesomsak et al. 2004; Frank and Goyal 2007a). Likewise, firm size and asset tangibility are additional firm level factors that the literature usually identifies as determinants of firm's capital structure since they are usually considered as inverse proxies for probability of bankruptcy, information asymmetry and agency and transaction cost (e.g., Jensen and Meckling 1976; Titman and Wessels 1988; Rajan and Zingales 1995; Frank and Goyal 2007a). In a similar vein, firm's past profitability and future growth opportunities are considered to be important determinants of capital structure and are

taken as proxies for probability of bankruptcy, agency costs, tax advantage and need for additional fund (e.g., Myers and Majluf 1984; Jensen 1986; Titman and Wessels 1988; Barclay and Smith 1999; Mazur 2007). Following the correction work of MM (1963), the literature routinely examines the nexus between taxes and corporate debt. A few studies see firm's dividend policy as proxy for additional fund needed, and information asymmetry and a tool for managing agency problems, and hence, consider it as a determinant of capital structure (e.g., Martin and Scott 1974; Miller and Rock 1985; Frank and Goyal 2007a; Mazur 2007). See Table 2.1 (Panel B) presented at the end of the chapter for a summary of theoretical predictions and empirical findings regarding the relationship between firm-specific characteristics and leverage.

2.2.4 Industry classification and basic capital structure

Prior literature proffers ample evidence on inter-industry variation in basic capital structure. For instance, in a response to Remmers, Stonehill, Wright and Beekhuisen (1974) who questioned the assertion of a nexus between industry classicisation and financial structure, Scott and Martin (1975), using Kruskal-Wallis one-way analysis of variance, present evidence that financial structures of firms vary across a wide array of industries. Later, Harris and Raviv (1991) remark that capital structures of firms within an industry are more similar than those in different industries. This pattern could be due to: (i) inter-industry differences in the operating characteristics; (ii) managers benchmarking industry's capital structure when they decide on their own firm; and (iii) a set of some correlated, but otherwise omitted, factors which influence capital structure at industry level (e.g., Frank and Goyal 2007a). There is no prior empirical research within the African setting has examined inter-industry heterogeneity in basic capital structure.

2.2.5 Institutions and basic capital structure

Consistent with institutional theory, recent literature highlights the importance of legal and financial institutions in the financial decisions of firms (e.g., Booth et al. 2001; Cheng and Shiu 2007; Antoniou et al. 2008; Lopez-Iturriaga and Rodriguez-Sanz 2008). In Table 2.1 (Panel A), the thesis presents a summary of the theoretical predictions and empirical evidence pertaining to the nexus between institutional variables and leverage. In what follows, the impact of legal and financial institutions on firm's capital structure decisions is explored.

2.2.5.1 Legal institutions

The literature accentuates the critical role of legal institutions in understanding patterns of corporate finance in different countries (e.g., La Porta, et al. 1998). Theory suggests that a major factor in a firm's choice of capital structure is the existence of agency costs. And, the legal environment in which contracting takes place affects the extent of agency problem that exists between corporate insiders and outsiders, and thus, influences outsiders' confidence in the markets and consequently their development (e.g., Djankov et al. 2008; Fan et al. 2008). Prior empirical work indicates that there are varying degrees of disparities between the laws in the books and laws in action. This phenomenon is particularly conspicuous when one considers the African continent as all African countries had adopted (or "transplanted") laws from Western origin (e.g., Berkowitz et al. 2003). This study considers the legal tradition on which a country's legal system is based to investigate cross-country disparities in capital structures. It further considers variables that are known to more

specifically define the legal institutions in a country: shareholder rights protection; creditor rights protection; and quality of law enforcement¹⁸.

2.2.5.2 Financial institutions

The extant literature considers the level of development of suppliers of capital - financial institutions - as one of the key factors in capital structure decisions of a firm. At the core of this argument is that financing patterns “fit” the governance system in the sense that those to whom the governance system gives most power to influence the policies of corporations would also be the main providers of funds (e.g., Hackethal and Schmidt 2004; Antoniou et al. 2008; Lopez-Iturriaga and Rodriguez-Sanz 2008). This chapter examines the influence of stock market and banking sector development on capital structure decisions of a firm. It uses two of the most commonly used measures of stock market development, namely, stock market size and stock market liquidity to capture stock market development. Furthermore, it uses the size of banking sector relative to GDP to measure banking sector development.¹⁹

2.2.6 Macroeconomic variables

The literature also alludes to the important role that the macroeconomic context in which a firm operates plays in the determination of its capital structure. The macroeconomic literature chronicles the vast debate on how to succinctly define and measure macroeconomic condition of a country and yet remains unsettled. In what follows, the chapter explores how macroeconomic conditions impact on firm’s basic capital structure decisions by invoking a

¹⁸ Although there are some critiques of the “law and finance” theory (e.g. Graff 2008; Spamann 2008, 2010) pioneered by La Porta et al., it remains the dominant view that explains differences in protections afforded to different classes of investors.

¹⁹ Demircug-Kunt and Levine (1996) present a detailed discussion regarding the various measures of size and efficiency of financial intermediaries.

host of macroeconomic variables. The variable selection was largely based the literature on capital structure and data availability.²⁰

2.2.6.1 Economic development and its growth rate

The notion that economic development of a given country is associated with the financing pattern of firms in that country is not new (e.g., Rajan and Zingales 1995; Booth et al. 2001). At the core of the argument that the level of economic development influences firm leverage is that it reflects the wealth disparity between countries and hence access to finance. Also, the literature conjectures that a firm's capital structure decisions might be impacted by the rate at which a country's economy grows as the latter is believed to be correlated with firm growth which is a proxy for a firm's investment opportunity set and its financing needs (Demirguc-Kunt and Maksimovic, 1998, 1999; Smith and Watts, 1992; Beck et al., 2002; Wanzenried 2006).

However, the fact that economic growth could be taken as a proxy for a multitude of factors partly explains the lack of consensus noted in both theoretical and empirical literature. For instance, one line of argument puts forwards economic growth as a possible driver for decline in expected bankruptcy cost, increase in the collateral values of assets, increase in stock prices and increase in free cash flow. Alternatively, another line of argument presents economic growth as an inverse proxy for agency conflicts between insiders and outsiders (e.g., De Haas and Peeters 2006; Frank and Goyal 2007b; Korajczyk 2003; Wanzenried 2006; Booth et al., 2001).

As indicated previously, zeroing on a succinct measure of economic development and its growth has been difficult and, expectedly, all of the indicators have limitations (e.g., Mahmud, Herani, Rajar and Farooqi 2009). The chapter first explores the potential

²⁰ Although some of the macroeconomic variables may have endogeneity problems, the system-GMM and SUR estimation procedures used in the chapter are robust to endogeneity issues.

relationship between economic development and leverage by trifurcating sample countries into income groups (Model 4) and then introduces more specific measures of the overall size of the economy (i.e., GDP per capita) and its growth rate (growth rate of real GDP per capita) as barometers to gauge the economic context within which a firm operates (Model 5).

2.2.6.2 Taxation

Taxation has long been recognized as a factor that effects on capital structure decisions of a firm (e.g., Borio 1990; Fan et al. 2008) as debt is expected to have tax advantage over equity. Notwithstanding the attention that taxation and tax institutions have received in capital structure research, there has not been one easy way of measuring them. One common approach considers effective (or marginal) tax rates computed from the financial statements to account for tax code differences between countries (e.g., Coates and Wooley 1975; Cheng and Shiu 2007). Such an approach fails to measure differences in tax institutions, at least, for two reasons. Firstly, it measures not only differences in statutory corporate tax rates in different countries but also differences in effective (marginal) tax rate due to firm specific characteristics. Secondly, it suffers from the disadvantage that effective tax rate also serves as a proxy for profitability because less profitable firms pay lower taxes than more profitable firms, or even pay no taxes (e.g., Cheng and Shiu 2007).

Another approach (e.g., Pattenden 2006; Fan et al. 2008) consider categorizing time periods and countries based on tax regimes. Although this approach mitigates the limitations of the previous approach to measuring tax effects, it wrongly assumes that tax expense of firms within the same tax regime is the same. Hence, it loses information related to differences in firm tax expense within a given tax regime. A third approach to measuring tax effects is the one employed by Rajan and Zingales (1995), Booth et al. (2001), etc. This approach uses a 'tax-advantage-index' called Miller's Tax Advantage (Miller 1977).

Although this approach solves many of the limitations linked with the previous two, it comes with a caveat that has to do with complications in computing the personal tax component of the index and tax code details that may not be easily captured by the formula (e.g., Booth et al. 2001). In this chapter, the highest marginal corporate tax rate is used as a proxy to measure differences in taxation systems across countries.

2.2.6.3 Inflation

The argument that inflationary situations affect the financing pattern of firms is, arguably, as old as capital structure research itself. Inflation rate is usually considered as a proxy for a government's ability to manage the economy and it provides information about the stability of the currency in long-term contracting (e.g., Demirgüç-Kunt and Maksimovic 1999). Following the extant literature, we use the log difference of consumer price index to proxy inflation.

2.3 The Empirical Framework

2.3.1 The sample and data

The study focused on firms in nine (9) selected countries in Africa including Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia. The choice of the sample countries was motivated by several factors. Firstly, they are all in Africa where the literature on the role of firm, industry, institutional and macroeconomic factors on a firm's capital structure is sparse. Secondly, these countries have different institutional setups, such as financial markets, legal traditions and level of economic development. In particular, Botswana, Ghana, Kenya, Nigeria and South Africa have legal systems based on the British common law, and thus, have some common attributes in corporate governance and control whereas Egypt, Mauritius, Morocco and Tunisia have legal

systems based on the French civil law. In addition, while the stock exchanges in Botswana, Ghana, Kenya, Nigeria, Mauritius, Morocco and Tunisia are young those in South Africa and Egypt are more established. Further, although not as wide, there is considerable difference in the level of economic development of these countries. This diversity offered the opportunity to assess the effects of different institutional and macroeconomic environments on capital structure.

Studies on capital structure may be based either on national flows-of-funds statements or individual company accounts. The merits and deficiencies of each source are discussed in Mayor (1989) and Sing and Hamid (1992). Sing and Hamid (1992) note that: (i) either source of data yields much the same conclusions with respect to corporate financing patterns and (ii) if the object of investigation is the financial characteristics of individual firms and inter-firm variations in these characteristics, it necessarily has to be based on company accounting information. As this chapter aims to go beyond aggregate analyses and involve in examination of the determinants of inter-industry and inter-firm differences, the later source of data was found to be more suitable.

The firm-specific data used for the analyses in this chapter was extracted from the financial statements of listed firms in the sample countries. The data were sourced from OSIRIS that maintains a comprehensive financial database of over 46,000 firms over 140 countries. We started with all the firms listed in the stock exchanges of 17 African countries which had data in the OSIRIS database as at 31 December 2009²¹. We required that firms in our sample should have at least three years of available data over the study period and countries should have at least 10 firms. We dropped firms in the financial industry (US SIC code 6000~) as such firms are regulated by a different set of regulations in regards to their capital structure.

²¹ Although the OSIRIS database includes data on non-listed firms, this study focused on listed companies as we believe that the debt maturity choice of non-listed firms is limited by other factors such as access to finance.

The final dataset analysed included a 10-year (between 1999 and 2008) data pertaining to 986 non-financial firms drawn from the sample countries. The sampled firms represent circa 48 per cent of listed companies which are active by the end of December 2009. We adjusted differences in fiscal years of firms in the sample to provide a more accurate empirical work. Hence, if the date of preparation of financial statements for a firm is on or before June 30, its year is stamped as one-year prior to its fiscal year and if a firm's fiscal year is after June 30, that same year is stamped as the firm's fiscal years.

Data on country specific variables were collected from various sources. Data on the legal variables, except for the rule of law data, were downloaded from the webpage of Andrei Shleifer.²² The rule of law data were taken from Kaufmann et al. (2009). All the data on country's macroeconomic and market conditions were taken either from World Development Indicators or Financial Structure Database of the World Bank. Additional country-specific variables were taken from previous studies including Berkowitz et al. (2003). The reader is reminded that we use data pertaining to the same sample firms for analysis in all of the subsequent chapters in the thesis.

2.3.2 Econometric modelling and estimation

2.3.2.1 Model specification

With a view to determine which set of factors – firm, industry or country factors – are more important determinants of capital structure, Fan et al. (2008) employ a sequential approach to modelling capital structure. A similar approach is employed in this chapter. Firstly, we analyse the data using a baseline model (Model 1) that defines capital structure as a linear function of firm characteristics ($X_{i,t}^f$). The model is written as:

²² We thank Andrei Shleifer for making several creditor rights, shareholder rights and legal origin data freely available on his page (<http://www.economics.harvard.edu/faculty/shleifer/dataset>).

$$Lev_{i,t} = \alpha + X_{i,t}^f \beta_f + \varepsilon_{i,t} \quad (1)$$

where $Lev_{i,t}$ is a measure of capital structure, $X_{i,t}^f$ is a vector of firm characteristics, β_f is a column vector containing the corresponding coefficients.

Secondly, we control for industry effects by introducing dummies (D_i^s) for each industry to examine if the industry in which a firm operates matter in the capital structure decisions of a firm (Model 2). The model is written as:

$$Lev_{i,t} = \alpha + X_{i,t}^f \beta_f + \sum_s \beta_s D_i^s + \varepsilon_{i,t} \quad (2)$$

where D_i^s is a dummy variable for industry classification to which firm i belongs and β_s is the corresponding coefficient. To avoid a dummy variable trap, we used the manufacturing industry as a reference industry²³. Thus, the coefficient β_s is interpreted as the significance of a particular measure of capital structure relative to firms in the manufacturing industries.

Thirdly, we further controlled for cross-country variations by introducing country dummies to see if the country in which a firm operates matter in capital structure decisions of a firm (Model 3). The model is written as follows:

$$Lev_{i,t} = \alpha + X_{i,t}^f \beta_f + \sum_s \beta_s D_i^s + \sum_c \beta_c D_i^c + \varepsilon_{i,t} \quad (3)$$

where D_i^c is a country-dummy and β_c is the corresponding coefficient. Again, in order to avoid a dummy variable trap problem, we use South Africa as a reference groups. South Africa was considered a reference group as it, arguably, has the most advanced institutional and macroeconomic infrastructure among the sample countries (e.g., Gwatidzo and Ojah 2009).

²³ The phrase ‘dummy variable trap’ refers to a situation where we experience perfect (multi)collinearity among independent variables due to inclusion of dummy variables for all of the groups while the model has an overall intercept. Hence, since we opted to have an overall intercept in our econometric model, the number of dummy variables introduced must be one less than the categories of that variable to avoid this problem.

Fourthly, we introduce legal, market, and macroeconomic variables that broadly define cross-country differences in institutions and macroeconomic characteristics of a country (Model 4). At this stage, we particularly introduce dummy variables for origin of legal systems (D_i^L) - that is, 1 for common law based legal systems, and 0 for civil law based legal systems - and economic development (D_i^Y) - that is, upper middle income groups, lower middle income group, and low income group. We also include interaction variables between country and firm characteristics to examine how the cross-sectional determinants of capital structure vary from country to country. The model is as follows:

$$Lev_{i,t} = \alpha + X_{i,t}^f \beta_f + \sum_L \beta_L D_i^L + \sum_Y \beta_Y D_i^Y + \sum_L \sum_Y \beta_{L*Y} D_i^L D_i^Y + \varepsilon_{i,t} \quad (4)$$

where D_i^L is a dummy variable for legal group to which firm i belongs and β_L is a column vector containing the corresponding coefficients; D_i^Y is a dummy variable for income group to which firm i belongs and β_Y is a column vector containing the corresponding coefficients.

Finally, in Model 5, we replace legal and macroeconomic variables that broadly define country characteristics by more specific legal, market and macroeconomic variables ($X_{i,t}^C$). The model is written as follows:

$$Lev_{i,t} = \alpha + X_{i,t}^f \beta_f + \sum_S \beta_S D_i^S + X_{i,t}^C \beta_C + \varepsilon_{i,t} \quad (5)$$

where $X_{i,t}^C$ is a vector of institutional and macroeconomic variables that are known to have effect on capital structure and β_C is a column vector containing the corresponding coefficients.

2.3.2.2 A brief comment on estimation procedures

The econometrics literature alludes to the superiority of panel data regression over cross-sectional regression procedures (e.g., Hsiao 1985; Baltagi 2005).²⁴ It identifies three basic panel data estimation procedures: pooled OLS, fixed effects (FE) and random effects

²⁴ Baltagi (2005) provides an elaborate discussion of the benefits and limitations of panel data procedures.

(RE). Although empirical literature favours FE over RE in basic capital structure research, the fact that our sample was not randomly drawn makes the sole use of FE problematic. Thus, we report parameter estimates using all of the three procedures. Nonetheless, the literature also points to the shortcomings of these basic procedures and suggests some variants of these procedures to address their limitations (e.g., Owusu-Gyapong 1986; Johnston and DiNardo 1997; Gujarati 2003; Cameron and Trivedi 2005; Lemmon, Roberts and Zender 2008; Menard 2008). The most common of these variants is the Seemingly Unrelated Regression (SUR) and system-GMM (Generalized Method of Moments) panel data estimation procedures. These procedures, unlike the three basic procedures mentioned earlier, are robust to firm heterogeneity and endogeneity problems that commonly plague modern finance research (e.g., Antoniou et al. 2006; Deesomsak et al. 2009). Thus, we use these later procedures for robustness check.

2.4 Results and Discussion

2.4.1 Descriptive statistics

2.4.1.1 The sample

To provide an insight about the sample, Table 2.2 presents an overview of the number of firms available in the dataset by country and industry. In terms of country distribution, we note that firms from Egypt and South Africa may heavily influence the sample; they constitute *circa* 79 per cent of firms included in the sample. On the other hand, those from Botswana and Ghana have little influence on the sample as they constitute only 2 per cent of firms included in the sample.

(Insert Table 2.2 about here)

Industry-wise, we observe firms in Non-durable, Manufacturing and Service industries may dominate the results with participation of 18 per cent, 18 per cent and 11 per cent, respectively. Firms from Durables and Health industries are at the other end of the spectrum, with only 3 per cent and 5 per cent participation, respectively.

2.4.1.2 The dependent variable

The capital structure of African firms has been evolving over the sample period. Table 2.3 presents descriptive statistics of measures of capital structure and its determinants for the sample firms. The overall mean leverage of all the firms included in the sample is 49.3 per cent, 11.8 per cent, and 37.5 per cent for total, long-term, and short-term leverage, respectively.

(Insert Table 2.3 about here)

Four salient patterns pertaining to financing decisions of African firms are noteworthy in Table 2.3. Firstly, independent of how capital structure is measured, we observe that the leverage ratios were varying over time. This is considered as an early indication that African firms might be attempting to adjust their capital structure toward a target. Secondly, we note a general upward trend in all the three measures of capital structure during the sample period. Total leverage, for example, increased from 41.3 per cent in 1999 to 47.6 per cent in 2008 while long-term leverage went from 9.9 per cent to 13.9 per cent over the same time period. As financial theory suggests, this trend could be due to the confluence of expansion in the economies and stock markets and rising inflation in the sample countries during the study period. It might also be due to the steady increase in profitability, growth opportunities, and dividend payout experienced by firms in the sample countries.

Thirdly, short-term leverage was on the decline over the second half of the sample period. This could be due to the effect of expanding stock markets in the sample countries

which may have encouraged quoted firms from using short-term debt to long-term debt. The steady increase in the size, profitability, and growth opportunities of the sampled firms during the study period might also have triggered the decline in short-term leverage (e.g., Barclay and Smith Jr 1995; Ozkan 2002; Deesomsak et al. 2009).

Finally, disaggregation of total leverage into its components (see Table 2.3 and 2.4) shows that short-term leverage dominates the capital structure of sampled firms. For example, long-term leverage ratio varied between a low of 9.9 per cent and a high of 13.9 per cent while short-term leverage varied between a low of 31.4 per cent and a high of 39.2 per cent over the sample period. We observe qualitatively similar results for the sub-samples as well (see Table 2.4 - Panel A to C). Prior empirical efforts in the African setting proffer broadly similar results (e.g., Negash 2002; Mutenheri and Green 2003; Toby 2005; Abor and Biekpe 2006; Yartey 2006; Salawu and Ile-Ife 2007; Gwatidzo and Ojah 2009). The tendency to rely on short-term leverage by African firms is consistent with the often small (if not non-existent) corporate bond markets; underdeveloped stock markets; relatively high information asymmetries; poor legal protection and enforcement systems; and macroeconomic instability (especially inflation) that epitomized African economies (e.g., Eldomiaty 2007; Ncube 2007).

(Insert Table 2.4 about here)

We probe the descriptive statistics to see if there are inter-industry variations in capital structure in Table 2.4 - Panel A. The results imply a preliminary inference: the mean leverages of industries are heterogeneous. For instance, in terms of total leverage, we note that firms in Chemical and Construction, Regulated, and Wholesale and Retail industries were the three most levered in that order. In contrast, those in Durables and Health industries were the least levered. On the other hand, in terms of short-term leverage, we observe that firms in Chemical and Construction, Business Equipment, and Wholesale and Retail

industries were the most levered in that order. In contrast, those in Oil and gas industry are the least levered.

Table 2.4 also presents a country-by-country summary statistics for the three measures of leverage. In terms of total leverage, it is noteworthy that firms in Nigeria and Ghana were the most levered while those in Morocco and Botswana are the least levered. In terms of short-term leverage, on the other hand, firms in Mauritius and Botswana were the least levered. Furthermore, firms in civil law countries appeared more highly levered, in terms of total and long-term leverage, than is the case in common law countries. The nature of variation in leverage ratios across income groups depends on the measure of leverage used. Specifically, firms in upper-middle-income countries generally tend to have higher long-term leverage and lesser short-term leverage compared to their counterparts in lower-middle-income and low income countries. Overall, this variation in capital structures of firms in the sub-samples is, perhaps, an early indication of potential heterogeneity in underlying factors that determine basic capital structure.

Previous cross-country studies on basic capital structure report that firms in developing countries exhibit lower leverage than those in developed countries (e.g., De Jong et al. 2008). As such, we assess whether the leverage ratios in our sample countries are comparable with those for developed and other developing economies²⁵ reported in Cheng and Shiu (2007)²⁶. As noted earlier, Table 2.4 indicates that the total leverage for our sample countries varies from a low of 44.1 per cent (Morocco) to a high of 64.9 per cent (Nigeria)²⁷. Cheng and Shiu (2007), on the other hand, report that total leverage varies from a low of

²⁵ The categorization of a country into developed and developing economy was based on the World Bank's income group of countries.

²⁶ Comparisons in most studies make reference to Rajan and Zingales (1995). However, since we note that Cheng and Shiu (2007) is more recent and comprehensive we opted to compare our results with Cheng and Shiu (2007).

²⁷ Average leverage ratio figures of our sample countries appear to be invariably greater than five countries sampled in Gwatidzo and Ojah (2009). These differences may probably have resulted due to the bigger sample we examined and some differences in definitions of leverage ratios

circa 41.9 per cent (Taiwan) to a high of 66.9 per cent (Indonesia) for developed countries and from a low of 31.8 per cent (Venezuela) to a high of *circa* 62.9 per cent (Pakistan) for other developing nations (see Table 2.5). Thus, unlike the allusions in other studies, in terms of total and long-term leverage, the level of leverage in our sample countries is more or less similar with those in other developing and developed economies. This finding suggests that one has to look into more specific measures of macroeconomic factors and more sophisticated econometric procedures to discern cross-country differences in capital structure.

(Insert Table 2.5 about here)

2.4.1.3 Firm characteristics

Firm-specific determinants of capital structure were selected based on those often suggested in the extant literature. Table 2.6 - Panel B presents a descriptive summary of the firm characteristics of our sample. From the table, we observe that countries with relatively smaller median firm size were Ghana and Tunisia; those with larger firm size included Mauritius, Nigeria and Morocco in that order. On the other hand, firms in Ghana exhibited the largest variation in firm size whereas those in Tunisia came last in terms of within country firm size variation. We also observe earnings volatility for firms in Nigeria, South Africa and Ghana were the highest while it was the lowest in Tunisia. The median return on assets (ROA) was highest in Botswana, Nigeria and South Africa in that order; it was the lowest in Mauritius, Tunisia and Morocco in that order. However, the ROA of firms in Nigeria is the most dispersed. In terms of median growth opportunities, firms in Ghana had 4 times the median growth opportunities experienced by those in Tunisia.

Our results also indicate that firms in Mauritius and Nigeria were the ones which had the most tangible assets while those in South Africa and Botswana had the least tangible assets. While firms in Tunisia and Egypt had the highest dividend payout ratio, those in

Nigeria and Ghana were paying out the least. In terms of non-debt related tax shield, firms in Tunisia had the biggest shield while those in Nigeria had the smallest. By way of summary, results in Table 2.6 affirm the view that firm characteristics exhibit cross-country as well as within country variations. We conjecture that these differences could result in differences in capital structure of firms in our sample.

2.4.1.4 Macroeconomic conditions

To gain insight into dissimilarities in macroeconomic characteristics of sample countries, we review macroeconomic variables including (i) taxation, (ii) inflation, (iii) size of overall economy, (iv) real GDP growth rate, and (v) income group to which the sample countries belonged. We note that average marginal corporate tax rates in sample countries spanned over a range of 15.0 per cent (Botswana) to 36.0 per cent (Egypt) while average inflation rates spanned from a low of *circa* 1.7 per cent (Morocco) to a high of *circa* 17.9 per cent (Ghana) over the sample period (see Table 2.6). These variations in marginal corporate tax rates and inflation rates might be reflections of differences in the way governments manage the economy and the ability of local currencies to provide a stable measure of value to be used in long-term contracting.

(Insert Table 2.6 about here)

We also observe that income level of sample countries is fairly diverse. It ranges from upper-middle-income countries (Botswana, Mauritius and South Africa) to lower-middle-income countries (Egypt, Morocco, and Tunisia) to low-income countries (Ghana, Kenya and Nigeria). Table 2.6 also indicates that GDP per capita and its growth rates vary considerably across sample countries confirming the existence of disparity in the wealth of sample countries, and hence, disparity in financing needs of firms in those countries (e.g., Demirgüç-Kunt and Maksimovic 1999).

2.4.1.5 Legal and financial institutions

In accordance with the view that legal and financial institutions shape the capital structure decisions of firms, the study explores the legal and financial institutions of sample countries. Table 2.6 presents a descriptive summary of the proxies for the level of development of legal and financial institutions in our sample countries. The results indicate that there are considerable cross-country variations in these institutions as measured by creditor rights protection index (from a low of 0 in Tunisia to a high of 4 in Kenya and Nigeria), shareholder rights protection index (from a low of 2 in Kenya and Morocco to a high of 5 in Ghana and South Africa), rule of law index (from a low of -1.31 in Nigeria to a high of 0.85 in Mauritius) and origin of legal systems. The legal systems of four of the sample countries (i.e., Egypt, Mauritius, Morocco, and Tunisia) were based on civil law tradition while those of five countries (South Africa, Botswana, Ghana, Kenya, and Nigeria) were based on common law. These variations in legal institutions of our sample countries could explain disparities in the optimal contract between firms and lenders' and creditors' ability to recoup loans which may affect the capital structure firms (e.g., Demirgüç-Kunt and Maksimovic 1999).

In terms of financial institutions, the size of the banking sector relative to GDP is the largest in Mauritius, Egypt, and South Africa in that order whereas it is the smallest in Nigeria, Botswana, and Ghana. The share of banking sector relative to GDP in Mauritius was close to five times that in Nigeria, three times that in Kenya, one and half times those in Morocco and Tunisia indicating a huge difference in the importance of banking sector in the sample countries. We also observe that there are considerable disparities in the level of stock market development as measured by liquidity and size of stock market. For instance, in terms of size, the Johannesburg Stock Exchange was 10 times the average stock market size for the sample countries and circa 17 times larger than the stock market in Tunisia and 4 times larger

than the first runner up (stock market size of Egypt) (Table 2.6). These variations in the relative size of banking sector and stock market development could result in cross-country disparity in access to external finance and diversification opportunities available to firms.

2.4.2 Correlation analyses

We present Pearson's pairwise correlation coefficients of variables along with their statistical significances in Table 2.7. We note that the correlation between short-term leverage and total leverage is stronger than is the case between long-term leverage and total leverage. This, perhaps, is because short-term leverage is the dominant form of financing in our sample countries. The correlation analysis also reveals that firm size is positively and significantly associated with leverage independent of how the latter is defined. While earnings volatility is positively and significantly correlated with leverage, dividend payout ratio is negatively and significantly associated with all the three measures of basic capital structure.

(Insert table 2.7 about here)

Also apparent in the correlation matrix is an inverse and statistically significant association between profitability and all the three measures of basic capital structure. Not surprisingly, the association between asset tangibility and leverage is sensitive to how the latter is defined; it is positively related with long-term leverage and inversely related with short-term leverage.

Our results also indicate that the association between most of the macroeconomic and institutional variables and leverage is dependent on how leverage is defined. For example, the highest marginal corporate tax rate, size of the overall economy, and rule of law are negatively and significantly related with total- and short-term leverage while they are positively and significantly associated with long-term leverage. We also observe that creditor and shareholder rights protection indices are positively associated with total and long-term

leverage ratios. The correlation matrix also shows that the relative size of a country's banking sector is negatively and significantly associated with leverage independent of how the latter is defined.

On the other hand, we note that the association between measures of stock market development (i.e., its size and liquidity) and leverage is sensitive to how the latter is measured. Specifically, both measures of stock market development are inversely related to short-term leverage while they have the opposite association with the other two measures of leverage. Finally, we note that the correlation coefficients between country-level determinants of capital structure are very high. To keep the estimation problem tractable and avoid problems of multicollinearity when estimating Equation 5 in the presence of high correlations, we develop slightly different specifications of Equation 5 by excluding highly correlated variables.

2.4.3 Regression results

In this section, we report regression results and their interpretation for Equations 1 up to 5. A range of estimation procedures were considered to examine if results are robust to econometric procedures.

2.4.3.1 Firm characteristics

We begin our analysis with a perusal of results of the baseline regression model (Model 1) which specifies only firm-specific factors as the independent variables that determine a firm's capital structure. Table 2.8 presents the parameter estimates and their corresponding statistical significance (or lack of it) for a range of estimation procedures.

(Insert table 2.8 about here)

Our results show that the nexus between firm size and leverage is positive and robust to estimation procedures and model specifications (see Tables 2.8, 2.9, 2.10, and 2.12). This result renders credence to the tax/bankruptcy trade-off argument which contends that larger firms are likely to be more diversified and hence pose less default risk to the lender which in turn affords larger firms more capacity to borrow. It is also consistent with information asymmetry argument which contends that larger firms are more visible, and hence, have lesser information asymmetry problems which in turn affords larger firms to borrow more. Many prior empirical endeavours reported similar results (e.g., Barclay and Smith 1999; Wiwattanakantang 1999; Booth, Dermirguc-Kunt et al. 2001; Deesomsak et al. 2004; Salawu and Ile-Ife 2007; Abor 2008; Antoniou et al. 2008).

In sync with the pecking order theory, we find a robustly significant and inverse relationship between profitability and capital structure. Tables 2.9 and 2.10 indicate that this inverse relationship persists even after the influence of industry and country variables is accounted. This signifies that firms in our sample would borrow less to fund their investment if they had increased internal fund. Although this finding is in contrast with propositions based on tax/bankruptcy and signalling theories it is consistent with empirical results reported in similar studies (e.g., Friend and Lang 1988; Rajan and Zingales 1995; Booth et al. 2001; Bevan and Danbolt 2002; Eldomiaty 2007; Mazur 2007; Salawu and Ile-Ife 2007; Abor 2008; Antoniou et al. 2008).

As in the preliminary results reported earlier, we note that the relationship between asset tangibility and leverage variables is a function of how the latter is measured. Specifically, the relationship is generally negative and statistically significant for short-term leverage while it is somehow positive for long-term leverage. This suggests that firms with more tangible assets tend to use their tangible assets as collateral to access long-term debt, and hence, depend less on short-term leverage. This is in line with reasoning based on both

tax/bankruptcy and agency theories which forward that firms with more tangible assets tend to have lower cost of bankruptcy and lower agency costs of debt (e.g., Jensen and Meckling 1976; Rajan and Zingales 1995; Frank and Goyal 2007a; Abor 2008; Antoniou et al. 2008; De Jong et al. 2008). Bevan and Bolt (2002) and Abor (2008) report similar results.

It is also interesting to note that the relationship between non-debt-related tax shield and leverage depends on how leverage is measured; while it negatively influences short-term and total leverage, it positively influences long-term leverage. This finding partially supports the argument that the higher the non-debt-related tax-shields such as depreciation, net operating loss carry forwards and tax credits, the lower the tax advantage that arises from interest deduction (e.g., Barclay and Smith 1999; Deesomsak, et al. 2004; Antoniou et al. 2008). While the inverse relationship corroborates the findings reported in Wiwattanakantang (1999) and Deesomsak et al. (2004), the direct relationship supports Song and Philippatos (2004).

Our results also indicate that the dividend payout variable negatively influences long-term leverage proffering support for the argument forwarded by agency theory which sees dividend payment and debt issues as substitutes in mitigating agency problems (e.g., Bhaduri 2002a, 2002b). This evidence also provides support for the argument presented by the information asymmetry camp which suggests that dividend announcements provide the missing pieces of information about firms and allow the market to estimate a firm's current earnings which in turn allows the firm to more readily access external finance (e.g., Miller and Rock 1985). As in the present study, an empirical study by Abor (2008) notes the sensitivity of the relation between dividend payout and leverage to how leverage is measured.

2.4.3.2 Industry characteristics

With a view to directly examine inter-industry variations in basic capital structure of sample firms, the chapter provides (see Table 2.9) parameter estimates for Model 2 using a range of estimation procedures.

(Insert table 2.9 about here)

We note that the short-term and total leverage of firms in the Wholesale and Retail and Chemical and Construction industries are significantly higher than those of firms in the Manufacturing industry²⁸. The results also indicate that the long-term and total leverage of firms in Regulated industries tend to be higher than those of firms in the Manufacturing industries. It is worthwhile to note that these results are robust to model specifications and estimation procedures (see Table 2.9, 2.10, 2.11, and 2.12). This evidence corroborates the view that industry-specific characteristics such as technologies and assets employed by industries and regulations to which industries are subjected influence the level of leverage by firms in those industries (e.g., Frank and Goyal 2007a). It also supports findings reported in other similar studies (e.g., Remmers et al. 1974; Hovakimian, Opler and Titman 2001; Faccio and Masulis 2005). Song and Philippatos (2004) particularly report that leverages of Regulated, Chemical and Construction industries, the Wholesale and Retail industries are higher than those of other industries.

Firms in the Durables industry, although sensitive to model specification and estimation procedures, also tend to have higher leverage than those in Manufacturing industries. In contrast, firms in Service and Other industries tend to have lower leverage than those in the referent Manufacturing industries.

²⁸ As agriculture is still the main stay of most African economies, it would have been interesting to see how capital structures of firms in other industries compare against those in the agriculture sector. However, since we didn't have enough number of listed companies for the agriculture sector in all the countries we considered, we opted to using manufacturing as our reference industry.

2.4.3.3 Country characteristics

It has previously been highlighted that a country's institutional and macro-economic contexts could decisively affect firm's capital structure. In line with this notion, in Table 2.10, the study attempts to examine cross-country variations in capital structure decisions of sample firms using various estimation procedures (Model 3).

(Insert table 2.10 about here)

The results indicate that firms in Nigeria had higher short-term and total leverage and lower long-term leverage than those in South Africa (Table 2.10). This could be due to the lower corporate marginal tax, higher inflation, smaller size of the overall economy, relatively less developed financial markets, inferior protection of shareholder rights, and inefficient law enforcement that epitomize Nigeria relative to South Africa (see Table 2.6-Panel A). This evidence only partially supports the findings reported in Gwatidzo and Ojah (2009). Ostensibly, this discrepancy in our findings is due to differences in model specification.

The results also show that firms in Egypt and Morocco had lower long-term and total leverage level relative to those in South Africa (see Table 2.10). Similarly, firms in Ghana and Tunisia had lower level of total leverage. Overall, our results corroborate the view that cross-country variations in country characteristics do matter in capital structure decisions of a firm.

The estimation results for Model 4 using a battery of econometric procedures are presented in Table 2.11 with a view to investigate the effect of contextual factors on capital structure decisions of sample firms.

(Insert table 2.11 about here)

The results of Model 4 indicate that firms in low-income countries tend to have higher short-term and total leverage compared to those in upper-middle-income countries. This is in line with our earlier speculation that more specific measures of country characteristics and more sophisticated econometric procedures may lead to better insights into cross-country variation in leverage. It is also consistent with the view that firms in less developed countries tend to use far more short-term leverage than those in more developed countries (e.g., Fan et al. 2008; Deesomsak et al. 2009).

Model 4 included interaction variables to see if firm characteristics impact on basic capital structure differently in different institutional and macroeconomic setups (see Table 2.11). We observe that the negative influence of profitability on short-term leverage is stronger in lower-middle-income countries than in other income group countries. Similarly, the positive influence of dividend payout ratio on long-term and total leverage is stronger in low-income countries than in the other two groups. Although econometrically not robust, our results show that origin of the legal system of a country influences the way firm-specific factors determine capital structure. Taking a cue from prior literature (e.g., Song and Philippatos 2004; De Jong et al. 2008; Fan et al. 2008), our interpretation of these results is that country characteristics, in addition to their direct impact on capital structure, indirectly influence capital structure by enhancing or mitigating the impact of firm-specific factors on capital structure.

As has been indicated previously, we further refine our definition of macroeconomic and institutional factors in Model 5. In this model, we include 10 variables that more narrowly define country characteristics. Because of the high correlation between the variables, we could not include all the variables in a single regression. Rather, we estimate separate regressions for a group of variables which do not have severe multicollinearity

problems. For reasons of brevity, Table 2.12 presents regression results of only seemingly unrelated regression (SUR) procedure.

(Insert table 2.12 about here)

The evidence indicates that the overall size of economy variable is positively related with long-term leverage; while it is negatively related with short-term and total leverage (see Table 2.12). That is, firms in richer countries tend to have more long-term and less short-term leverage relative to their counterparts in poorer countries. This could be due to the more developed financial and legal institutions (i.e., bigger and more liquid stock markets, bigger banking sector, superior shareholder rights protection, and more efficient rule of law) that epitomized richer countries in our sample (see Table 2.7). Our interpretation of this result is that the nexus between size of overall economy variable and leverage is dependent on how the latter is measured and is moderated by the influence that economic development has on the development of financial and legal institutions. This evidence signifies the role of access to finance, bankruptcy, agency and transaction costs in capital structure decisions of sample firms. However, our result does not support the suggestion by some early studies (e.g., Singh and Hamid 1992; Singh 1995) that there is a positive relationship between economic development and leverage regardless of how the latter is defined. Rather, it confirms the “qualified” relationship reported in Booth et al. (2001) which underscored the definitional sensitivity of the relationship.

Besides the size of overall economy, its growth rate also affects firm’s leverage decisions. We observe that the growth rate of real GDP per capita negatively influences long-term and total leverage (see Table 2.12) supporting the proposition that the likely increase in stock price during times of economic growth should lead to lower leverage by a firm (e.g., Korajczyk 2003; De Haas and Peeters 2006; Frank and Goyal 2007b). This evidence also renders credence to the view that the likely increase in profits during times of economic

growth should lead to lower leverage by a firm (e.g., Booth et al. 2001; Song and Philippos 2004; Wanzenried 2006). Cheng and Shiu (2007) and Beck et al. (2002) report similar results. This implies that issue of market timing; agency, transaction and bankruptcy costs; and information asymmetry might be well at play in the capital structure decisions of sample firms (e.g., De Haas and Peeters, 2006, Frank and Goyal, 2007b, Korajczyk, 2003, Wanzenried, 2006, Booth et al., 2001).

In line with the conjecture that a firm is likely to issue more debt under inflationary environment since inflationary situations not only decrease the real value of debt but also increase the real tax advantage of debt for firms (e.g., Taggart 1985; Frank and Goyal 2007a), we find a positive association between inflation and leverage (see Table 2.12). Arguments based on both tax/bankruptcy and market timing theories lead conjectures that propose a positive association between the two variables.

Also, we document clear evidence that investor (both shareholders and creditors) rights protection positively and significantly influences firm's leverage. The direct relationship between shareholder rights protection variable and leverage is consistent with the view that strong protection of shareholder rights protracts demise of a firm during financial distress, and hence, a firm in such a country is likely to use more debt (e.g., De Jong et al. 2008). Song and Philippos (2004), in a study of firms in 30 OECD countries, report similar results. On the other hand, the positive relationship between creditor rights protection variable and leverage is in congruence with the view that stronger creditor rights protection reduces creditor's risk, and hence, promotes development of debt markets which in turn increases the likelihood that a firm uses debt to finance its investments (e.g., La Porta et al. 2000; Djankov et al. 2007). Evidence reported in Deesomsak et al. (2004) and Cheng and Shiu (2007) corroborates out results.

The inverse relationship between the rule of law variable and leverage (see Table 2.12) that we observe in our results appears to be in line with Fan et al.'s (2008) view that poor quality of law enforcement discourages lenders from lending as it increases the likelihood that they will be expropriated by insiders, thus, reducing the borrowing opportunities of a firm. However, this result is in stark contrast with the hypotheses that better quality of law enforcement is likely to reduce agency costs and enhances the development of debt markets which in turn increases firm leverage (e.g., Gul 2001). In a study which examined the role of firm-and country-specific factors in the determination of a firm's capital structure, De Jong et al. (2008) reports similar results. In a similar vein, Antoniou et al. (2008) carried out a comparative study of the determinants of capital structure of firms in European countries and found that rule of law is negatively related with leverage.

In terms of the effect of size of banking sector variable on leverage, we note that the former has a negative influence on the latter (see Table 2.12) implying that the bigger the relative size of the banking sector, the less levered would a firm in such a country be. We, however, find this result to be in contradiction with the expectation that more developed banking sector reduces costs related with information asymmetry, agency and bankruptcy, and hence, likely to increase the level of leverage by a firm (e.g., Levine 2002; Antoniou et al. 2008). Our interpretation of this result is that the stronger creditor rights protection and better quality of law enforcement that characterized those countries with bigger banking sector in our sample (see Table 2.7) may have discouraged firms from borrowing money, as they may want to reduce the risks that come with debt. This result is consistent with the findings reported in Demirgüç-Kunt and Maksimovic (1999) and Cheng and Shiu (2007).

We find the role of development of stock markets, as measured by its size and liquidity, on leverage depends on how the latter is measured. We observe that the two variables that measure stock market development influence long-term leverage positively

while their relationship to short-term and total leverage variables is negative and statistically weak. This partially supports the view that developed stock markets reduce information asymmetry problems faced by creditors, and hence, enhance the borrowing opportunities of a publicly quoted firm. As in this study, Cheng and Shiu (2007) report that the relationship is dependent on how leverage is measured.

2.5 Conclusions

Based on mainstream capital structure theory, this chapter argued that basic capital structure of a firm is a function of not only firm characteristics but also of industry, institutional and macroeconomic characteristics. The chapter interrogated the data by employing a sequence of models to examine the role of different factors and checked robustness of results through [all] available econometric procedures. The chapter documents a number of findings from the analyses.

We observe differences in basic capital structure of firms in our sample attributable to firm-specific characteristics. Leverage, independent of how it is defined, tends to be higher in larger firms whilst it is likely to be lower in smaller firms. Also, asset tangibility is observed to have a positive influence on long-term leverage whilst it has an inverse influence on short-term leverage. These evidences imply that firms in our sample consider probability of default, adverse selection and agency costs as important factors in the determination of their basic capital structure. On the other hand, the evidence that more profitable firms tend to have less leverage while less profitable firms tend to have more leverage signifies the role that transaction costs and information asymmetry problems play in the determination of basic capital structure of firms in our sample. Furthermore, the chapter established that non-debt-related tax-shield is positively related to long-term leverage while is negatively related short-term leverage. This evidence partially corroborates the argument that the higher the non-debt-

related tax-shields such as depreciation, net operating loss carry forwards and tax credits, the lower the tax advantage that arises from interest deduction. Finally, the chapter indicates that dividend payout variable negatively influences long-term leverage proffering further evidence that firms in our sample considers agency costs and information asymmetry issues in basic capital structure decisions.

The industry in which a firm operates also seems to have an influence on the basic capital structure decisions of firms in our sample. We observe that the inter-industry differences appear to be a function of how capital structure is defined. We particularly note that short-term and total leverage of firms in the Wholesale and Retail and Chemical and Construction industries are significantly higher than those of firms in the Manufacturing industry. On the other hand, long-term leverage of firms in Regulated industries tends to be higher than those of firms in the Manufacturing industries. This signifies the role that industry specific operating characteristics and regulations play in a firm's capital structure decisions.

In terms of macroeconomic conditions, we observe that firms in richer countries tend to have more long-term and less short-term leverage than is the case in poorer countries. In contrast, the rate of economic growth is indirectly related with long-term and total leverage. Also, firms in our sample countries are likely to issue more debt under inflationary environment. In addition to direct influences, we observe that the negative influence of profitability on short-term leverage is stronger in lower-middle-income countries than is the case in other income group countries. Similarly, the positive influence of dividend payout ratio on long-term and total leverage is stronger in low-income countries than is the case in the other two groups. Put together, these evidences connote that such factors as access to finance, firm's investment opportunity set and financing needs, probability of bankruptcy,

agency costs and market timing issues are central in the determination of basic capital structure of firms in our sample.

At institutional level, our findings indicated that there is: (i) a direct relationship between investor (both shareholders and creditors) rights protection and a firm's leverage; (ii) an inverse relationship between the rule of law variable, size of banking sector and leverage; and (iii) a “definitionally-sensitive” relationship between development of stock markets and leverage. These evidences suggest that agency and contract enforcement costs are among the considerations in basic capital structure decisions of a firm in the sample.

Recently, the literature has leaped into the investigation of whether firms adjust their capital structure toward a target. In Chapter 3, the thesis examines whether the sample firms adjust their capital structures toward a target, and if so, attempts to identify the factors that impact on the adjustment speed towards the target.

Table 2.1: Determinants of capital structure, theoretical predictions, and empirical findings

Panel A: Institutional and macroeconomic characteristics and capital structure

S. No	Variables	Theoretical Framework			Summary of Empirical Results			
		Tax-bankruptcy	Agency	Market timing	Positive influence on capital structure	Negative influence on capital structure	±	No influence on capital structure
1.	Shareholder Rights		-		Song & Philippatos (2004)	Chen et al. (2000)		De Jong et al. (2008)
2.	Rule of Law	+	+/-			De Jong et al. (2008) Antoniou et al. (2008)		
3.	Creditor Rights	+	+/-		Deesomsak et al. (2004); Cheng and Shiu (2007)	De Jong et al. (2008)		
4.	Taxation	+			Rajan & Zingales (1995); Booth et al. (2001), Cheng & Shiu (2007),		Song & Philippatos (2004)	Mayor (1994)
5.	Inflation	+/-		+		Cheng & Shiu (2007), Beck et al. (2002)	Booth et al. (2001)	Fan et al. (2008)
6.	Size of economy			-	Sing & Hamid (1992) Sing (1995); Song & Philippatos (2004); Booth et al. (2001); Chui et al. (2002); Fan et al. (2008)	Cobham and Subramaniam (1998); Beck et al. (2002); Cheng and Shiu (2007)		
7.	Economic Growth	+	+/-	-	Chui et al. (2002), Song & Philippatos (2004), De Jong et al. (2008)	Beck et al. (2002)	Booth et al. (2001)	De Haas & Peeters (2006)
8.	Market Capitalization	-	+			Song & Philippatos (2004)	Cheng & Shiu (2007)	
9.	Stock Market Turnover	-	+			Song & Philippatos (2004)	Cheng & Shiu (2007)	
10	Size of Banking Sector	+	+		Song & Philippatos (2004) Booth et al. (2001)	Demirguc-Kunt & Maksimovic (1999) Cheng & Shiu (2007)		Rajan & Zingales (1995)

Notes: The table presents a summary of the theoretical predictions and empirical results regarding the relationship between institutional and macroeconomic variables and capital structure. TBT refers to tax-bankruptcy trade-off theory; POT denotes pecking order theory; ST signifies signalling theory. When a theory is silent or when there is significant ambiguity regarding the appropriate interpretation, the cell is left blank. The (+/-) sign signifies the possibility that plausible arguments could be made for a positive as well as a negative relationship using a given theory. ± denotes the sensitivity of empirical results either to the way the dependent variable is defined or country variations. 0 denotes that there were studies which reported support for no relationship between the variable indicated and financing decisions.

Panel B: Firm characteristics and capital structure

S. No	Variables	Theoretical Predictions				Summary of Empirical Results			
		TBT	Agency	POT	ST*	Positive influence on capital structure	Negative influence on capital structure	±	No influence on capital structure
1.	Firm size	+		+/-		Prasad et al. (2001), Wiwattanakantang (1999), Barclay & Smith (1999), Abor (2008), Booth et al. (2001), Deesomsak et al. (2004), Song & Philippatos (2004), Antoniou et al. (2008), Salawu and Ile-Ife (2007)	Fan et al. (2008)	Bhaduri (2002a & 2002b), Bevan & Danbolt (2002), Titman & Wessels (1988), de Jong et al. (2008), Rajan & Zingales (1995), de Jong et al. (2008)	
2.	Profitability	+		-	+		Song & Philippatos (2004), Booth et al. (2001), Abor (2008), Friend (1988), Bevan & Danbolt (2002), Rajan & Zingales (1995), Mazur (2007), Antoniou et al. (2008), Eldomiaty (2007), Salawu and Ile-Ife (2007)	Titman & Wessels (1988)	Deesomsak et al. (2004)
3.	Growth opportunities	-	-	+		Bevan & Danbolt (2002), Abor (2008), Chen et al., (1999), Salawu and Ile-Ife, 2007)	Barclay & Smith (1999), Song & Philippatos (2004)	Bevan & Danbolt (2002), Bhaduri (2002a & 2002b), Rajan & Zingales (1995), Deesomsak et al. (2004), Booth et al. (2001), de Jong et al. (2008)	
4.	Asset tangibility	+	+	+/-		Bradley et al. (1984), Rajan & Zingales (1995), Prasad et al. (2001), de Jong et al. (2008)		Abor (2008), Bevan & Danbolt (2002), Salawu & Ile-Ife (2007), Bevan & Danbolt (2002), Booth et al. (2001)	Bhaduri (2002a & 2002b), Titman & Wessels (1988), Wiwattanakantang (1999), Deesomsak et al. (2004)
5.	Tax shield	-				Song & Philippatos (2004),	Deesomsak et al. (2004), Song & Philippatos (2004), Wiwattanakantang (1999)		Barclay & Smith (1999),
6.	Earnings volatility	-	+	-			Eldomiaty (2007)	Abor (2008), De Jong et al. (2008), Booth et al. (2001)	Titman & Wessels (1988), Wiwattanakantang (1999), Deesomsak et al. (2004)
8.	Dividend policy		-	+	+/-			Abor (2008)	

Notes: The table presents a summary of the theoretical predictions and empirical results regarding the relationship between institutional and macroeconomic variables and capital structure. TBT refers to tax-bankruptcy trade-off theory; POT denotes pecking order theory; ST signifies signalling theory. When a theory is silent or when there is significant ambiguity regarding the appropriate interpretation, the cell is left blank. The (+/-) sign signifies the possibility that plausible arguments could be made for a positive as well as a negative relationship using a given theory. ± denotes the sensitivity of empirical results either to the way the dependent variable is defined or country variations. 0 denotes that there were studies which reported support for no relationship between the variable indicated and financing decisions.

Table 2.2: Composition of the sample

Industry	Country									All firms	All firms (%)
	Egypt	South Africa	Botswana	Ghana	Kenya	Mauritius	Morocco	Nigeria	Tunisia		
Non-durables	107	26	1	3	8	9	8	14	3	179	18
Durables	18	9	1	0	1	1	0	1	1	32	3
Manufacturing	114	31	0	2	4	1	7	11	3	173	18
Oil and Gas	7	41	0	0	3	1	4	2	1	59	6
Chem. & constriction	75	16	0	1	1	0	3	5	4	105	11
Business equipment	11	35	0	1	0	0	5	2	2	56	6
Regulated	23	15	0	0	5	2	2	1	2	50	5
Wholesale & Retail	51	38	6	2	4	7	6	10	3	127	13
Health	38	5	0	1	0	0	1	6	2	53	5
Service & other	80	36	3	0	6	4	3	19	3	153	16
All firms	522	252	11	10	32	25	39	71	24	986	100
All firms (%)	53	26	1	1	3	3	4	7	2	100	

Notes: The table provides a country-by-country and industry-by-industry composition of the sampled firms. Non-durables (IND1) include industries which fall within the following US SIC classifications: 0100-0999, 2000-2399, 2700-2799, 3100-3199, and 3940-3989. Durables (IND2) include industries which fall within the following US SIC classifications: 2400*, 2500-2519, 2590-2599, 3630-3659, 3710-3711, 3714-3714, 3716-3716, 3750-3751, 3792-3792, 3900-3939, and 3990-3999. Manufacturing (IND3) includes industries which fall within the following US SIC classifications: 2520-2589, 2600-2699, 2750-2769, 3000-3099, 3200-3569, 3580-3629, 3700-3709, 3712-3713, 3715-3715, 3717-3749, 3752-3791, 3793-3799, 3830-3839, and 3860-3899. Oil and Gas industry (IND4) includes industries which fall within the following US SIC classifications: 1000*, 1400*, 1200-1399, and 2900-2999. Chemical and construction industries (IND5) include industries which fall within the following US SIC classifications: 1500*, 1600*, 1700*, 2800-2829, 2840-2899. Business equipment industry (IND6) includes industries which fall within the following US SIC classifications: 3570-3579, 3660-3692, 3694-3699, 3810-3829, 7370-7379. Regulatory industries (IND7) include industries which fall within the following US SIC classifications: 4000*, 4400*, 4500*, 4600*, 4800-4899, 4900-4949. Wholesale and retail industries (IND8) include industries which fall within the following US SIC classifications: 5000-5999, 7200-7299, 7600-7699. Health industries (IND9) include industries which fall within the following US SIC classifications: 2830-2839, 3693-3693, 3840-3859, 8000-8099. Service & etc industries (IND10) include all others.

Table 2.3 Evolution of firm and country characteristics

Panel A: Descriptive statistics of firm characteristics

Year	Firm Size	Earnings Volatility	Profitability	Growth Opportunities	Asset Tangibility	Dividend Payout	Tax shield
1999	5.221	0.244	0.274	0.024	0.543	0.293	0.031
2000	5.108	0.270	0.059	0.034	0.457	0.634	0.030
2001	5.150	0.274	0.124	0.058	0.390	0.553	0.038
2002	4.968	0.216	0.086	0.029	0.369	0.675	0.036
2003	4.961	0.235	0.094	0.056	0.362	0.687	0.036
2004	4.973	0.219	0.106	0.053	0.348	0.632	0.034
2005	5.067	0.234	0.118	0.035	0.337	0.584	0.033
2006	5.170	0.208	0.114	0.078	0.326	0.601	0.031
2007	5.321	0.225	0.130	0.086	0.322	0.614	0.031
2008	5.417	0.209	0.122	0.075	0.325	0.613	0.033
Overall	5.116	0.224	0.112	0.059	0.350	0.619	0.034

Note: Firm size refers to the average of the natural logarithm total sales. Earnings volatility refers to the average of absolute value of first difference of the natural logarithm of profit after tax. Profitability refers to the average of the ratio of earnings before interest and taxes to total assets. Growth opportunities refer to the average of the first difference of the natural logarithm of sales. Asset tangibility refers to the average of the ratio of tangible fixed assets to total assets. Dividend payout refers to the average of the ratio of cash dividend paid to profit after tax. Tax shield refers to the average of the ratio of depreciation, amortization and depletion to total assets.

Panel B: Descriptive statistics of institutional and macroeconomics characteristics

Year	Total Leverage	Long-term Leverage	Short-term Leverage	Taxation	Inflation	Size of Economy	Growth of Economy	Size of Stock Market	Liquidity of Stock Market	Size of Banking Sector	Creditor Rights	Shareholder Rights	Rule of Law
1999	0.413	0.099	0.314	35.108	4.098	3.188	2.332	73.484	26.960	0.660	2.384	3.550	.
2000	0.448	0.100	0.348	34.985	4.213	3.199	2.621	58.206	28.824	0.657	2.384	3.550	-0.077
2001	0.488	0.121	0.367	34.985	4.821	3.206	1.677	46.577	18.948	0.691	2.384	3.550	.
2002	0.501	0.115	0.386	34.985	5.363	3.210	1.034	61.606	30.713	0.702	2.384	3.550	-0.102
2003	0.500	0.109	0.392	34.863	5.797	3.220	2.206	62.971	20.428	0.699	2.384	3.550	-0.125
2004	0.500	0.112	0.388	34.863	8.252	3.233	3.202	85.285	23.278	0.705	2.384	3.550	-0.036
2005	0.499	0.115	0.384	34.863	5.530	3.246	2.980	112.525	35.167	0.709	2.384	3.550	-0.030
2006	0.498	0.121	0.377	34.531	7.001	3.266	4.609	125.792	44.854	0.691	2.384	3.550	-0.099
2007	0.490	0.131	0.359	23.404	8.021	3.285	4.592	144.504	42.829	0.679	2.384	3.550	-0.119
2008	0.476	0.139	0.337	23.404	NA	NA	NA	NA	51.166	.	2.384	3.550	-0.100
Overall	0.493	0.118	0.375	32.599	5.899	3.228	2.806	85.661	32.317	0.688	2.384	3.550	-0.086

Notes: Total leverage refers to the average of the ratio of total liabilities total assets. Long-term leverage refers to the average of the ratio of non-current liabilities to total assets. Short-term leverage denotes the average of the ratio of current liabilities to total assets. Taxation refers to the average of the highest corporate marginal tax rate (%). Inflation refers to the average of the consumer price index which is the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Size of economy is measured by the average of the logarithm of GDP per capita (constant 2000 US\$). Growth of Economy denotes the average of the logarithm of GDP per capita growth (constant 2000 US\$). Size of stock market refers to the average of the value of listed shares to GDP, calculated using the following deflation method: $\{(0.5) \cdot [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is stock market capitalization, P_e is end-of period CPI, and P_a is average annual CPI. Liquidity of stock market refers to the average of ratio of the value of total shares traded to average real market capitalization, the denominator is deflated using the following method: $T_t/P_{at} / \{(0.5) \cdot [M_t/P_{et} + M_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where T is total value traded, M is stock market capitalization, P_e is end-of period CPI P_a is average annual CPI. Size of banking sector denotes the average of Claims on domestic real nonfinancial sector by deposit money banks as a share of GDP, calculated using the following deflation method: $\{(0.5) \cdot [F_t/P_{et} + F_{t-1}/P_{et-1}]\} / [GDP_t/P_{at}]$ where F is deposit money bank claims, P_e is end-of period CPI, and P_a is average annual CPI. Creditor rights protection index refers to an index aggregating creditor rights, following La Porta and others (1998). A score of one is assigned when each of the following rights of secured lenders is defined in laws and regulations: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. Second, secured creditors are able to seize their collateral after the reorganization petition is approved, i.e. there is no "automatic stay" or "asset freeze." Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Finally, if management does not retain administration of its property pending the resolution of the reorganization. The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights) and is constructed as at January for every year from 1978 to 2003. Shareholder rights protection index refers to an index of Anti-director rights is formed by adding one when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders= Meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders= Meeting is less than or equal to ten per cent (the sample median); or (6) when shareholders have pre-emptive rights that can only be waived by a shareholders meeting. The range for the index is from zero to six.

Table 2.4 Summary statistics of leverage by sub-samples

Panel A: Summary statistics of measures of capital structure by industry

	Short-term leverage			Long-term leverage			Total leverage		
	Mean	SD*	Obs#	Mean	SD*	Obs#	Mean	SD*	Obs#
Non-durables	0.345	0.209	1006	0.109	0.159	1055	0.467	0.288	1011
Durables	0.342	0.178	167	0.088	0.115	170	0.432	0.212	167
Manufacturing	0.357	0.194	921	0.124	0.176	958	0.482	0.245	922
Oil & Gas	0.265	0.233	385	0.197	0.206	383	0.477	0.321	386
Chem. & Construction	0.445	0.224	523	0.108	0.164	536	0.555	0.230	523
Business Equipment	0.429	0.243	346	0.078	0.105	350	0.526	0.316	346
Regulated	0.367	0.200	304	0.182	0.194	310	0.546	0.226	305
Wholesale & Retail	0.428	0.229	697	0.095	0.119	748	0.545	0.309	705
Health	0.352	0.189	283	0.074	0.138	294	0.435	0.232	283
Service & Others	0.318	0.226	814	0.132	0.160	862	0.462	0.293	814

* SD = standard deviation; # Obs = number of observations

Panel B: Summary statistics of measures of capital structure by country

	Short-term leverage			Long-term leverage			Total-leverage		
	Mean	SD*	Obs#	Mean	SD*	Obs#	Mean	SD*	Obs#
Egypt	0.377	0.235	2685	0.083	0.149	2702	0.471	0.296	2697
South Africa	0.349	0.199	1664	0.167	0.176	1663	0.523	0.261	1665
Botswana	0.291	0.173	74	0.151	0.167	74	0.442	0.167	74
Ghana	0.483	0.249	52	0.085	0.169	54	0.608	0.418	53
Kenya	0.309	0.186	150	0.200	0.157	163	0.509	0.202	151
Mauritius	0.286	0.188	173	0.181	0.113	173	0.467	0.211	173
Morocco	0.356	0.182	288	0.085	0.121	289	0.441	0.221	288
Nigeria	0.504	0.256	184	0.098	0.155	371	0.649	0.298	185
Tunisia	0.319	0.182	176	0.155	0.147	177	0.475	0.241	176

* SD = standard deviation; # Obs = number of observations

Panel C: Summary statistics of measures of capital structure by legal origin

	Short-term leverage			Long-term leverage			Total -leverage		
	Mean	SD*	Obs#	Mean	SD	Obs.	Mean	SD	Obs
Common law	0.367	0.210	3322	0.092	0.174	3341	0.468	0.266	3334
Civil law	0.361	0.228	2122	0.156	0.148	2325	0.533	0.284	2128

Panel D: Summary statistics of measures of capital structure by income group

	Short-term leverage			Long-term leverage			Total -leverage		
	Mean	SD*	Obs#	Mean	SD	Obs.	Mean	SD	Obs
Upper-middle-income countries	0.341	0.198	1911	0.168	0.171	1910	0.515	0.254	1912
Lower-middle-income countries	0.372	0.229	3149	0.088	0.148	3168	0.469	0.287	3161
Low income countries	0.425	0.248	388	0.125	0.163	588	0.589	0.292	389

Notes: The table presents a summary of descriptive statistics by industry, by, country, by legal origin and by income group. Common law refers to countries that had adopted their legal codes from the English common law tradition. Civil law refers to countries that had adopted their legal codes from the French civil law tradition. Classification of countries into income groups is based on the World Banks classification of countries as upper-middle-income, lower-middle-income, and low-income countries.

Table 2.5: Leverage Ratios Reported in Cheng and Shiu, 2007

	No. of Firms	Time Period	Total Leverage	Long Term Leverage
Developed Countries				
Greece	NA	1998-2001	0.4691	0.0602
Hong Kong	NA	1998-2001	0.4215	0.0899
Germany	NA	1998-2001	0.6048	0.0966
Singapore	NA	1998-2001	0.4656	0.1028
Italy	NA	1998-2001	0.5859	0.1073
UK	NA	1998-2001	0.5150	0.1103
Taiwan	NA	1998-2001	0.4188	0.1121
Spain	NA	1998-2001	0.5356	0.1152
Austria	NA	1998-2001	0.6101	0.1218
Japan	NA	1998-2001	0.5858	0.1233
France	NA	1998-2001	0.6150	0.1239
Israel	NA	1998-2001	0.4613	0.1251
The Netherlands	NA	1998-2001	0.6055	0.1270
Portugal	NA	1998-2001	0.5652	0.1359
Belgium	NA	1998-2001	0.5993	0.1387
Sweden	NA	1998-2001	0.5208	0.1429
Denmark	NA	1998-2001	0.5526	0.1447
Australia	NA	1998-2001	0.4215	0.1451
Ireland	NA	1998-2001	0.4743	0.1697
Switzerland	NA	1998-2001	0.5542	0.1735
Finland	NA	1998-2001	0.5160	0.1796
Indonesia	NA	1998-2001	0.6685	0.1960
Canada	NA	1998-2001	0.4639	0.2052
USA	NA	1998-2001	0.5834	0.2094
South Korea	NA	1998-2001	0.6620	0.2131
New Zealand	NA	1998-2001	0.4843	0.2470
Norway	NA	1998-2001	0.5562	0.2494
Other Developing Countries				
Turkey	NA	1998-2001	0.5237	0.0714
Zimbabwe	NA	1998-2001	0.4994	0.0778
Venezuela	NA	1998-2001	0.3180	0.0908
Sri Lanka	NA	1998-2001	0.4513	0.0943
Colombia	NA	1998-2001	0.3327	0.0949
Malaysia	NA	1998-2001	0.5187	0.1158
Peru	NA	1998-2001	0.4482	0.1199
Argentina	NA	1998-2001	0.4772	0.1425
Chile	NA	1998-2001	0.3953	0.1447
Philippines	NA	1998-2001	0.4634	0.1484
Brazil	NA	1998-2001	0.5760	0.1504
Jordan	NA	1998-2001	0.3394	0.1566
Mexico	NA	1998-2001	0.4733	0.1633
Pakistan	NA	1998-2001	0.6291	0.1779
Thailand	NA	1998-2001	0.6197	0.1870
India	NA	1998-2001	0.5687	0.2168

Source: Cheng and Shiu (2007). "Investor protection and capital structure: International evidence." Journal of Multinational Financial Management 17(1): 30-44.

Table 2.6: Summary statistics of independent variables by country**Panel A: Summary of Country Characteristics**

Country	Taxation	Inflation	Size of overall Economy	Growth rate of Real GDP	Income Group	Stock market size	Stock market liquidity	Size of banking sector	Creditor Rights	Shareholder Rights	Rule of Law	Origin
Egypt	36.00	5.38	3.20	2.91	LMI	53.74	32.97	0.78	2.00	3.00	-0.04	0.00
South Africa	29.50	5.31	3.51	2.53	UMI	201.47	48.02	0.73	3.00	5.00	0.12	1.00
Botswana	15.00	8.26	3.60	4.40	UMI	27.01	3.21	0.18	3.00	3.50	0.62	1.00
Ghana	29.90	17.93	2.43	2.82	LI	16.56	3.07	0.24	1.00	5.00	-0.10	1.00
Kenya	30.30	8.82	2.62	1.15	LI	25.79	7.35	0.33	4.00	2.00	-0.95	1.00
Mauritius	23.00	6.03	3.62	3.36	UMI	42.15	6.65	0.84	2.25	3.50	0.85	0.00
Morocco	35.00	1.66	3.17	2.93	LMI	44.57	18.76	0.64	1.00	2.00	-0.03	0.00
Nigeria	25.00	11.76	2.61	2.92	LI	17.88	14.05	0.18	4.00	4.00	-1.31	1.00
Tunisia	31.34	2.92	3.35	3.93	LMI	12.00	17.44	0.62	0.00	3.00	0.20	0.00
	21.06	6.38	2.38	2.39	NA	20.66	7.84	0.34	1.56	2.48	-0.08	NA

Notes: The table presents average values for country level characteristics. All variables are averaged over the period 1999 – 2008. The exact definition of the variables is as in table 2.3.

Source: Data on country specific variables were obtained from World Development, Financial Structure Database of the World Bank, Berkowitz et al. (2003), Kaufmann et al. (2009) and the personal webpage of Andrei Shleifer.

Panel B: Summary of Firm Characteristics by Country

Country	Statistic	Firm Size	Earnings Volatility	Profitability	Growth Opport.	Asset Tangibility	Dividend Payout	Tax Shield
Egypt	Mean	4.912	0.220	0.095	0.055	0.362	0.714	0.030
	Median	4.903	0.132	0.086	0.052	0.328	0.567	0.024
	St. Dev	0.816	0.246	0.189	0.191	0.254	0.898	0.027
	Observation	2686	1784	2706	2155	2702	1570	2427
South Africa	Mean	5.343	0.241	0.123	0.072	0.278	0.462	0.037
	Median	5.520	0.163	0.119	0.061	0.206	0.262	0.032
	St. Dev	1.187	0.238	0.569	0.233	0.232	0.981	0.029
	Observation	1629	1053	1655	1357	1621	211	1401
Botswana	Mean	5.112	0.235	0.171	0.070	0.248	0.665	0.035
	Median	4.934	0.127	0.134	0.059	0.240	0.466	0.030
	St. Dev	0.678	0.265	0.163	0.213	0.178	0.805	0.030
	Observation	73	53	74	62	74	30	44
Ghana	Mean	4.428	0.229	0.099	0.120	0.428	0.258	0.036
	Median	4.545	0.154	0.110	0.103	0.367	0.158	0.033
	St. Dev	1.513	0.203	0.181	0.086	0.256	0.303	0.037
	Observation	54	28	54	33	53	41	48
Kenya	Mean	5.322	0.184	0.121	0.054	0.410	0.487	0.036
	Median	5.665	0.123	0.102	0.054	0.369	0.341	0.033
	St. Dev	1.060	0.194	0.140	0.142	0.220	0.634	0.025
	Observation	163	114	159	135	149	88	116
Mauritius	Mean	5.514	0.203	0.081	0.040	0.490	0.554	0.040
	Median	5.841	0.125	0.069	0.043	0.502	0.421	0.029
	St. Dev	1.021	0.223	0.076	0.092	0.187	0.560	0.035
	Observation	173	122	168	144	142	42	63
Morocco	Mean	5.405	0.204	0.104	0.047	0.271	0.587	0.044
	Median	5.563	0.125	0.086	0.044	0.242	0.473	0.036
	St. Dev	0.943	0.238	0.093	0.140	0.205	0.587	0.032
	Observation	289	231	289	250	280	130	286
Nigeria	Mean	5.449	0.234	0.206	0.056	0.600	0.248	0.018
	Median	5.612	0.175	0.126	0.067	0.530	0.000	0.000
	St. Dev	0.971	0.230	0.629	0.201	0.354	0.597	0.026
	Observation	379	228	371	326	340	245	265
Tunisia	Mean	4.566	0.188	0.077	0.040	0.327	0.693	0.054
	Median	4.604	0.107	0.083	0.026	0.311	0.576	0.050
	St. Dev	0.532	0.213	0.066	0.092	0.154	0.677	0.028
	Observation	177	115	177	153	177	91	162

Notes: The table presents mean (median in parenthesis) values for firm characteristics and number of observations for the sample countries. All variables are averaged over the period 1999 – 2008, in which data are required to be available at least for three years. The exact definition of the variables is as in table 2.3.

Table 2.7: Correlation Matrices

Panel A: Leverage and firm characteristics

	Total leverage	Long-term leverage	Short-term leverage	Firm Size	Earnings Volatility	Profit.	Growth Opprtun.	Asset Tangibility	Div. Pay	Tax Shield
Total leverage	1.000 ***	0.436 ***	0.744 ***	0.104 ***	0.030 *	-0.085 ***	-0.002	-0.085 ***	-0.095 ***	-0.009
Long-term leverage	0.436 ***	1.000 ***	-0.181 ***	0.023 *	0.061 ***	-0.052 ***	0.055 ***	0.230 ***	-0.099 ***	0.130 ***
Short-term leverage	0.744 ***	-0.181 ***	1.000 ***	0.120 ***	-0.008	-0.039 ***	-0.019	-0.309 ***	-0.039 *	-0.096 ***

Notes: The table reports the correlation coefficients between the three measures of leverage and firm-specific variables. Correlation coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Panel B: Leverage and country variables

	Taxation	Inflation	Size of Economy	Grwth of Economy	Size of Stk Mkt	Liq. of Stk Mkt	Size of Bnk'g	Creditor rights	Sharehol rights	Rule of Law
Total leverage	-0.026 *	0.043 ***	-0.033 **	0.019	0.049 ***	0.000	-0.081 ***	0.100 ***	0.097 ***	-0.075 ***
Long-term leverage	0.052 ***	-0.037 ***	0.122 ***	0.045 ***	0.155 ***	0.068 ***	-0.032 **	0.123 ***	0.168 ***	0.049 ***
Short-term leverage	-0.130 ***	0.068 ***	-0.114 ***	-0.019	-0.050 ***	-0.049 ***	-0.042 ***	0.012	-0.011	-0.111 ***

Notes: The table reports the correlation coefficients between the three measures of leverage and macroeconomic and institutional variables. Correlation coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Panel C: Pairwise correlation analysis of independent variables

	Firm Size [1]	Earnings Volatility [2]	Profit. [3]	Growth Opprt. [4]	Asset Tang. [5]	Div. Pay [6]	Tax Shield [7]	Taxation [8]	Inflation [9]	Size of Economy [10]	Grwth of Economy [11]	Size of Stk Mkt [12]	Liq. of Stk Mkt [13]	Size of Bnk'g [14]	Creditor Rights [15]	Shareholder Rights [16]	Rule of Law [17]
[1]	1.000 ***																
[2]	-0.044 ***	1.000 ***															
[3]	0.077 ***	-0.011	1.000 ***														
[4]	0.111 ***	0.077 ***	0.124 ***	1.000 ***													
[5]	-0.020	-0.009	0.016	0.018	1.000 ***												
[6]	-0.031	0.134 ***	-0.040 **	-0.121 ***	-0.015 **	1.000 ***											
[7]	0.029 **	-0.020	-0.010	0.003	0.288 ***	0.045 **	1.000 ***										
[8]	-0.186 ***	0.006	-0.050 ***	-0.039 ***	-0.042 ***	0.090 ***	-0.005	1.000 ***									
[9]	0.023 *	-0.011	0.034 **	0.048 ***	0.169 ***	-0.115 ***	-0.117 ***	-0.394 ***	1.000 ***								
[10]	0.034 **	0.022	-0.031 **	0.018	-0.258 ***	0.127 ***	0.128 ***	-0.070 ***	-0.398 ***	1.000 ***							
[11]	0.081 ***	-0.024	0.008	0.041 ***	-0.072 ***	-0.008	0.006	-0.235 ***	0.150 ***	0.106 ***	1.000 ***						
[12]	0.145 ***	0.041 **	0.029 **	0.057 ***	-0.196 ***	-0.019	0.023	-0.347 ***	-0.051 ***	0.649 ***	0.161 ***	1.000 ***					
[13]	0.092 ***	0.022	0.008	0.029 **	-0.152 ***	0.034 *	0.010	-0.213 ***	-0.026 **	0.513 ***	0.363 ***	0.696 ***	1.000 ***				
[14]	-0.096 ***	0.011	-0.068 ***	0.001	-0.188 ***	0.157 ***	0.042 ***	0.533 ***	-0.475 ***	0.669 ***	-0.053 ***	0.245 ***	0.330 ***	1.000 ***			
[15]	0.178 ***	0.034 **	0.061 ***	0.026 *	0.078 ***	-0.124 ***	-0.101 ***	-0.384 ***	0.350 ***	-0.200 ***	-0.135 ***	0.325 ***	0.062 ***	-0.532 ***	1.000 ***		
[16]	0.127 ***	0.052 ***	0.033 **	0.044 ***	-0.084 ***	-0.111 ***	0.028 **	-0.346 ***	0.125 ***	0.435 ***	-0.041 ***	0.747 ***	0.388 ***	-0.073 ***	0.515 ***	1.000 ***	
[17]	-0.035 **	0.021	-0.011	0.005	-0.176 ***	0.097 ***	0.096 ***	0.129 ***	-0.457 ***	0.852 ***	-0.080 ***	0.338 ***	0.217 ***	0.769 ***	-0.516 ***	0.144 ***	1.000 ***

Notes: The table reports the Pairwise correlation coefficients between the independent variables. Correlation coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definitions of the variables is as presented in Table 2.3.

Table 2.8: Firm characteristics and capital structure

Panel A: Dependent Variable - Short Term Leverage					
	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.018	-0.022 *	-0.014	-0.015	-0.022
Firm Size	0.034 ***	0.040 ***	0.103 ***	0.010 *	0.037 ***
Profitability	-0.143 **	-0.150 ***	-0.178 ***	-0.040 *	-0.126 ***
Growth Opportunities	0.038	0.020	-0.010	-0.004	0.038
Asset Tangibility	-0.285 ***	-0.162 ***	-0.054	-0.087 *	-0.282 ***
Dividend Payout	-0.007	0.004	0.004	0.011	-0.007
Tax Shield	-0.183	-0.388 **	-0.495 **	-0.599 **	-0.193
Constant	0.296 ***	0.216 ***	-0.157	0.241 ***	0.247 ***
F-statistic	17.04 ***	-	3.54 ***	-	-
Chi2	-	37337.12 ***	-	129.81 ***	339.45 ***
Hausman Test	-	58.28 ***	58.28 ***	-	-
N	1695	1695	1695	1662	1695

Panel B: Dependent Variable – Long Term Leverage					
	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.043 ***	0.016	0.011	0.002	0.049 ***
Firm Size	0.007	0.008	0.011	-0.010	0.006 *
Profitability	-0.096 **	-0.127 ***	-0.135 ***	-0.022	-0.110 ***
Growth Opportunities	0.015	-0.001	-0.002	-0.005	0.009
Asset Tangibility	0.171 ***	0.135 ***	0.091 **	0.012	0.175 ***
Dividend Payout	-0.019 ***	-0.009 ***	-0.007 **	0.007	-0.020 ***
Tax Shield	0.343	-0.113	-0.238	-0.639 *	0.295 **
Constant	-0.003	0.027	0.022	0.016	-0.003
F-statistic	14.7 ***	-	2.04 ***	-	-
Chi2	-	85.73 ***	-	413.53 ***	340.12 ***
Hausman Test	-	12.13	12.13	-	-
N	1743	1743	1743	1725	1743

Panel C: Dependent Variable – Total Leverage					
	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.027	-0.005	0.001	-0.010	0.027
Firm Size	0.045 ***	0.055 ***	0.136 ***	-0.017	0.046 ***
Profitability	-0.217 ***	-0.276 ***	-0.317 ***	-0.101 *	-0.217 ***
Growth Opportunities	0.043	0.010	-0.028	-0.024	0.041
Asset Tangibility	-0.090 **	0.012	0.079	-0.006	-0.089 ***
Dividend Payout	-0.027 ***	-0.005	-0.003	0.018	-0.027 ***
Tax Shield	0.013	-0.615 ***	-0.790 ***	-0.872 *	0.023
Constant	0.268 ***	0.195 ***	-0.260	0.194 *	0.252 ***
F-statistic	6.35 ***	-	3.2 ***	-	-
Chi2	-	58981.04 ***	-	169.08 ***	121.67 ***
Hausman Test	-	21.94	21.94	-	-
N	1696	1696	1696	1664	1696

Notes: The table reports the regression results for short-term, long-term and total leverage using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 2.9: Firm characteristics, Industry Classifications and Capital Structure

Panel A: Short-term Leverage	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.016	-0.022 *	-0.014	-0.018	-0.021
Firm Size	0.031 ***	0.038 ***	0.103 ***	0.029	0.034 ***
Profitability	-0.128 *	-0.144 ***	-0.178 ***	-0.027 *	-0.110 ***
Growth Opportunities	0.029	0.019	-0.009	-0.010	0.029
Asset Tangibility	-0.247 ***	-0.139 ***	-0.054	-0.060 **	-0.245 ***
Dividend Payout	-0.007	0.004	0.004	0.010	-0.007
Tax Shield	-0.134	-0.395 **	-0.495 **	-0.687 *	-0.144
Non-durables	-0.004	0.001	-	-0.022	-0.005
Durables	0.000	0.026	-	0.127	-0.001
Oil and Gas	-0.001	-0.003	-	0.001	0.000
Chem. & Construction	0.058 **	0.059 **	-	-0.031	0.057 ***
Business Equipment	0.023	0.067	-	-0.022	0.023
Regulated	0.006	0.029	-	0.058	0.009
Wholesale & Retail	0.065 **	0.081 ***	-	0.054 *	0.065 ***
Health	-0.008	0.017	-	0.002	-0.010
Service & etc	-0.034	-0.009	-	-0.024 8	-0.030 **
Constant	0.286 ***	0.198 ***	-0.157	0.257 *	0.238 ***
F-statistic	8.460 ***	-	3.540 ***	-	-
Chi2	-	39328 ***	-	177.67 ***	394.4 ***
Hausman Test	-	38.160 ***	38.160 ***	-	-
N	1695	1695	1695	1662	1695
Panel B: Long term Leverage	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.046 ***	0.016	0.011	-0.006	0.052 ***
Firm Size	0.009	0.010	0.011	-0.007	0.008 **
Profitability	-0.105 ***	-0.130 ***	-0.135 ***	-0.020 *	-0.117 ***
Growth Opportunities	0.014	-0.002	-0.002	-0.006	0.008
Asset Tangibility	0.179 ***	0.134 ***	0.091 **	0.009 *	0.184 ***
Dividend Payout	-0.017 ***	-0.009 ***	-0.006 **	0.006	-0.018 ***
Tax Shield	0.285	-0.134	-0.238	-0.626 *	0.234 **
Non-durables	0.003	0.000	-	-0.025	0.005
Durables	-0.007	0.014	-	-0.049	-0.007
Oil and Gas	0.046 **	0.061 ***	-	0.029 *	0.045 ***
Chem. & Construction	0.015	0.009	-	-0.031	0.016
Business Equipment	-0.007	-0.016	-	-0.038	-0.007
Regulated	0.088 ***	0.091 ***	-	-0.011	0.087 ***
Wholesale & Retail	0.014	0.005	-	0.004	0.016
Health	0.002	0.001	-	-0.008	0.004
Service & etc	-0.004	0.006	-	0.009	-0.005
Constant	-0.026	0.004	0.022	0.068	0.002
F-statistic	8.980 ***	-	2.040 ***	-	-
Chi2	-	119.2 ***	-	474.02 ***	424.78 ***
Hausman Test	-	13.550	13.550	-	-
N	1743	1743	1743	1725	1743
Panel C: Total Leverage	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.031	-0.005	0.000	-0.009	0.031
Firm Size	0.045 ***	0.056 ***	0.136 ***	-0.011	0.046 ***
Profitability	-0.208 **	-0.272 ***	-0.317 ***	-0.121 *	-0.206 ***
Growth Opportunities	0.033	0.008	-0.028	-0.023	0.033
Asset Tangibility	-0.041	0.032	0.079	0.003	-0.042 *
Dividend Payout	-0.026 ***	-0.005	-0.003	0.016	-0.025 ***
Tax Shield	-0.006	-0.641 ***	-0.790 ***	-0.680 *	0.002
Non-durables	-0.002	-0.003	-	-0.069 *	-0.001
Durables	-0.003	0.043	-	0.027	-0.005
Oil and Gas	0.041	0.056	-	0.010	0.041
Chem. & Construction	0.079 **	0.074 **	-	0.002	0.078 ***
Business Equipment	0.025	0.065	-	-0.086	0.023
Regulated	0.095 **	0.124 ***	-	0.027	0.095 ***
Wholesale & Retail	0.073 **	0.081 **	-	0.101 *	0.073 ***
Health	-0.004	0.020	-	-0.049	-0.005
Service & etc	-0.042	-0.005	-	-0.041	-0.040 **
Constant	0.231 ***	0.153 **	-0.260	0.210 *	0.215 ***
F-statistic	4.550 ***	-	3.200 ***	-	-
Chi2	-	61334 ***	-	347.33 ***	199.14 ***
Hausman Test	-	18.290	18.290	-	-
N	1696	1696	1696	1664	1696

Notes: The table reports the regression results for short-term, long-term and total leverage using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 2.10: Firm characteristics, industry and country dummies and capital structure

	Panel A: Dependent Variable – Short term Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.023	-0.022 *	-0.014	-0.008	-0.025
Firm Size	0.029 ***	0.038 ***	0.103 ***	0.019 **	0.032 ***
Profitability	-0.132 **	-0.144 ***	-0.178 ***	-0.010 *	-0.117 ***
Growth Opportunities	0.021	0.017	-0.009	-0.001	0.020
Asset Tangibility	-0.262 ***	-0.146 ***	-0.054	-0.049 *	-0.260 ***
Dividend Payout	-0.006	0.004	0.004	0.014 *	-0.006
Tax Shield	0.049	-0.345 *	-0.495 ***	-0.448	0.031
Non-durables	-0.011	-0.004	-	-0.053	-0.011
Durables	0.011	0.033	-	0.131	0.010
Oil and Gas	0.015	0.008	-	0.005	0.012
Chem. & Construction	0.060 **	0.061 **	-	-0.040	0.060 ***
Business Equipment	0.046	0.083 *	-	-0.005	0.044 *
Regulated	0.011	0.042	-	-0.042	0.013
Wholesale & Retail	0.067 **	0.082 ***	-	0.074 *	0.067 ***
Health	-0.008	0.015	-	-0.053	-0.009
Service & etc	-0.039 *	-0.013	-	-0.033 *	-0.036 **
Egypt	0.034	0.021	-	0.116 **	0.029 *
Botswana	-0.050	-0.021	-	0.141	-0.053
Ghana	0.054	0.071	-	0.131	0.056
Kenya	0.055	0.031	-	0.060	0.052 **
Mauritius	0.035	-0.036	-	0.239 *	0.032
Morocco	-0.007	-0.022	-	0.114	-0.012
Nigeria	0.174 ***	0.142 ***	-	0.128 *	0.168 ***
Tunisia	-0.027	-0.018	-	0.245 **	-0.025
Constant	0.258 ***	0.174 **	-0.157	0.110	0.230 ***
F-statistic	7.780 ***	-	3.540 ***	-	-
Chi2	-	40577 ***	-	155.81 ***	491.42 ***
Hausman Test	-	37.460 ***	37.460 ***	-	-
N	1695	1695	1695	1662	1695

	Panel B: Dependent Variable - Long term Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.044 ***	0.016	0.011	-0.015	0.048 ***
Firm Size	0.002	0.000	0.011	-0.008	0.001
Profitability	-0.120 ***	-0.132 ***	-0.135 ***	-0.031 *	-0.128 ***
Growth Opportunities	0.014	0.001	-0.002	-0.010	0.009
Asset Tangibility	0.178 ***	0.140 ***	0.091 **	0.013 **	0.182 ***
Dividend Payout	-0.014 ***	-0.008 ***	-0.006 **	0.004	-0.014 ***
Tax Shield	0.197	-0.165	-0.238	-0.606 *	0.160
Non-durables	-0.002	-0.004	-	-0.043	0.000
Durables	-0.020	-0.001	-	-0.042	-0.019
Oil and Gas	0.002	0.014	-	-0.010	0.002
Chem. & Construction	0.017	0.011	-	-0.043	0.018 *
Business Equipment	-0.036 **	-0.051 ***	-	-0.092 *	-0.034 **
Regulated	0.067 ***	0.062 **	-	-0.039	0.068 ***
Wholesale and Retail	-0.007	-0.020	-	-0.030	-0.006
Health	0.003	0.004	-	-0.050	0.005
Service & etc	-0.018	-0.006	-	-0.033 *	-0.019 **
Egypt	-0.105 ***	-0.115 ***	-	-0.031 **	-0.102 ***
Botswana	-0.025	-0.018	-	0.164	-0.024
Ghana	-0.118 ***	-0.120 ***	-	0.011	-0.120 ***
Kenya	-0.014	-0.018	-	0.044	-0.014
Mauritius	-0.008	0.006	-	0.128	-0.007
Morocco	-0.096 ***	-0.084 ***	-	-0.034 *	-0.085 ***
Nigeria	-0.070 ***	-0.068 ***	-	0.012	-0.049 ***
Tunisia	-0.058 **	-0.052 *	-	-0.008 *	-0.058 ***
Constant	0.111 **	0.153 ***	0.022	0.161	0.126 ***
F-statistic	10.640 ***	-	2.040 ***	-	-
Chi2	-	236.08 ***	-	753.97 ***	629.64 ***
Hausman Test	-	13.190	13.390	-	-
N	1743	1743	1743	1725	1743

Table 2.10: (con'd...)

	Panel C: Dependent Variable – Total Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	0.022	-0.006	0.000	-0.005	0.022
Firm Size	0.036 ***	0.047 ***	0.136 ***	-0.002	0.037 ***
Profitability	-0.224 ***	-0.272 ***	-0.317 ***	-0.135 *	-0.220 ***
Growth Opportunities	0.022	0.009	-0.028	-0.018	0.021
Asset Tangibility	-0.057	0.027	0.079	0.028	-0.057 **
Dividend Payout	-0.021 ***	-0.004	-0.003	0.016	-0.021 ***
Tax Shield	0.075	-0.621 ***	-0.790 ***	-0.551	0.077
Non-durables	-0.014	-0.011	-	-0.097	-0.014
Durables	-0.005	0.037	-	0.005	-0.005
Oil and Gas	0.017	0.022	-	0.026	0.016
Chem. & Construction	0.083 **	0.078 **	-	-0.004	0.082 ***
Business Equipment	0.021	0.047	-	-0.151	0.020
Regulated	0.083 *	0.110 ***	-	-0.068	0.083 ***
Wholesale & Retail	0.051	0.054	-	0.104 *	0.052 ***
Health	-0.003	0.020	-	-0.103	-0.003
Service & etc	-0.061 **	-0.022	-	-0.072 *	-0.060 ***
Egypt	-0.062 **	-0.088 ***	-	0.080	-0.063 ***
Botswana	-0.056	-0.023	-	0.474	-0.057
Ghana	-0.050	-0.037	-	0.132	-0.050
Kenya	0.039	0.011	-	0.157	0.039
Mauritius	0.035	-0.031	-	0.199	0.035
Morocco	-0.091 **	-0.103 **	-	0.063	-0.092 ***
Nigeria	0.151 ***	0.104 **	-	0.107 **	0.151 ***
Tunisia	-0.066	-0.059	-	0.207	-0.067 **
Constant	0.329 ***	0.270 ***	-0.260	0.142	0.319 ***
F-statistic	5.940 ***	-	3.200 ***	-	-
Chi2	-	61608 ***	-	215.86 ***	345.66 ***
Hausman Test	-	24.100 *	24.100 *	-	-
N	1696	1696	1696	1664	1696

Notes: The table reports the regression results for short-term, long-term and total leverage using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 2.11: Firm, industry, institutional and macroeconomic dummies and capital structure

	Panel A: Dependent Variable – Short term Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.169 *	-0.016	0.043	0.286	-0.177
Firm Size	0.045	0.064	0.260 **	0.137	0.047 *
Profitability	0.986	0.240	0.124	-1.097	1.140 **
Growth Opportunities	-0.471	-0.362	-0.622 *	-0.974	-0.546
Asset Tangibility	-0.465	0.107	0.464 **	0.162	-0.463 ***
Dividend Payout	-0.018	-0.012	0.000	-0.012	-0.016
Tax Shield	0.156	-0.245	-4.550	-10.466 *	0.035
Non-durables	-0.013	-0.006	-	-0.084 *	-0.013
Durables	0.014	0.035	-	0.139	0.013
Oil and Gas	-0.008	-0.012	-	0.072	-0.010
Chem. & Construction	0.057 **	0.060 **	-	-0.021	0.058 ***
Business Equipment	0.026	0.067	-	-0.101	0.025
Regulated	0.005	0.037	-	-0.043	0.008
Wholesale & Retail	0.054 *	0.077 **	-	0.017 *	0.054 ***
Health	-0.005	0.018	-	-0.197 *	-0.006
Service & etc	-0.030	-0.004	-	0.024	-0.027 *
Common	0.013	0.378	-	1.111	0.032
Dev2	-0.017	0.289	-	1.224	-0.017
Dev3	0.353 **	0.314 **	-	0.780 *	0.344 ***
Common*Profitability	-0.982	-0.248	-0.218	1.072	-1.130 **
Common*Asset Tangibility	0.199	-0.243	-0.375	-0.217	0.198
Common*Tax Shield	0.572	-0.514	3.020	9.919	0.611
Common*Growth Opport.	0.556	0.350	0.625 *	0.981	0.647
Common*Earnings Vol.	0.100	-0.020	-0.060	-0.145	0.112
Common*Firm Size	-0.021	-0.034	-0.144	-0.277	-0.022
Dev2*Earnings Vol.	0.168 *	-0.006	-0.063	-0.183	0.168
Dev3*Earnings Vol.	0.077	0.017	0.028	0.047	0.073
Dev2*Div. Payout	0.010	0.016 *	0.005	0.022 *	0.008
DEV3*Div. Payout	0.022	0.019	0.003	0.003	0.021
Dev2*Growth Opport.	0.491	0.380	0.616 *	1.005	0.562
DEV3*Growth Opport.	-0.161	-0.052	-0.039	0.133	-0.191
Dev2*Firm Size	-0.002	-0.013	-0.158	-0.269	0.000
DEV3*Firm Size	-0.032	-0.032	-0.008	-0.115 *	-0.031 *
DEV2*Profitability	-1.180 *	-0.431	-0.314	0.975	-1.310 **
DEV3*Profitability	-0.060	-0.168	-0.155	-0.116	-0.051
DEV2*Asset Tangibility	0.219	-0.255	-0.537 ***	-0.202	0.218
DEV3*Asset Tangibility	-0.089	-0.091	-0.204	-0.105	-0.093
DEV2*Tax Shield	-0.374	-0.085	4.180	9.924	-0.249
DEV3*Tax Shield	-1.010	0.044	0.690	0.535	-0.934
Constant	0.244	-0.156	-0.177	-1.054	0.199
F-statistic	5.910 ***	-	2.630 ***	-	-
Chi2	-	43053 ***	-	284.46 ***	492.99 ***
Hausman Test	-	31.110	31.110	-	-
N	1695	1695	1695	1662	1695

Table 2.11: (Cont'd ...)

	Panel B: Dependent Variable – Long term Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.002	-0.030	-0.033	-0.110	0.005
Firm Size	-0.005	-0.011	-0.033	-0.179	-0.007
Profitability	-0.410 *	-0.296 *	0.051	-0.282	-0.480
Growth Opportunities	-0.136	-0.003	-0.062	0.359	-0.108
Asset Tangibility	0.406 ***	0.278 ***	0.051	1.187 *	0.408 ***
Dividend Payout	-0.022 **	-0.004	0.013	-0.008 *	-0.018 *
Tax Shield	-0.229	-0.271	-0.696	7.432	-0.170
Non-durables	-0.003	-0.006	-	-0.031	-0.002
Durables	-0.007	0.008	-	-0.016	-0.007
Oil and Gas	-0.009	0.011	-	-0.050	-0.008
Chem. & Construction	0.018	0.011	-	-0.050	0.018 *
Business Equipment	-0.027	-0.039 **	-	-0.065 *	-0.026 *
Regulated	0.072 ***	0.069 **	-	0.022 *	0.071 ***
Wholesale & Retail	-0.005	-0.017	-	-0.003	-0.003
Health	-0.001	0.003	-	0.002	0.000
Service & etc	-0.008	-0.004	-	-0.015	-0.009
Common	0.134	0.032	-	0.739	0.124
Dev2	-0.147	-0.191 **	-	0.249	-0.145
Dev3	-0.105	-0.103	-	-0.453	-0.105
Common*Profitability	0.282	0.296	0.024	0.264	0.353
Common*Asset Tangibility	-0.098	-0.100	-0.234	-1.084	-0.103
Common*Tax Shield	-0.323	0.487	1.780	-7.420	-0.342
Common*Growth Opport.	0.183	0.014	0.119	-0.410	0.155
Common*Earnings Vol.	0.001	0.030	0.027	0.095	0.000
Common*Firm Size	-0.016	-0.009	-0.077	0.039	-0.016
Dev2*Earnings Vol.	0.046	0.052	0.053 *	0.189 *	0.042
Dev3*Earnings Vol.	0.061	0.025	0.029	0.038	0.055
Dev2*Div. Payout	0.004	-0.006	-0.021	0.007	-0.001
DEV3*Div. Payout	0.044 ***	0.001	-0.018	-0.003	0.034 **
Dev2*Growth Opport.	0.130	-0.009	0.046	-0.368	0.101
DEV3*Growth Opport.	0.012	0.015	-0.063	0.057	-0.020
Dev2*Firm Size	0.020	0.023	0.056	0.118	0.020
DEV3*Firm Size	0.005	0.019	0.165	0.077	0.009
DEV2*Profitability	0.284	0.095	-0.268	0.224	0.340
DEV3*Profitability	-0.012	-0.051	-0.081	-0.013	0.003
DEV2*Asset Tangibility	-0.249 ***	-0.127	0.094	-1.157 *	-0.254 ***
DEV3*Asset Tangibility	-0.144	-0.131	0.106	-0.084 *	-0.115 ***
DEV2*Tax Shield	0.555	0.051	0.310	-7.779	0.521
DEV3*Tax Shield	0.949	-0.099	-0.995	0.020	0.584
Constant	0.099	0.185 **	0.022	-0.251	0.119
F-statistic	15.920 ***	-	2.410 ***	-	-
Chi2	-	392.50 ***	-	509.35 ***	662.56 ***
Hausman Test	-	27.000	27.000	-	-
N	1743	1743	1743	1725	1743

Table 2.11: (Cont'd ...)

	Panel C: Dependent Variable – Total Leverage				
	OLS	RE	FE	GMM	SUR
Earnings Volatility	-0.168 **	-0.046	0.006	0.184	-0.172
Firm Size	0.039	0.053	0.226	0.223	0.040
Profitability	0.584	-0.014	0.153	-1.869	0.656
Growth Opportunities	-0.609	-0.371	-0.686	-0.549	-0.661
Asset Tangibility	-0.055	0.374 *	0.496 **	0.847	-0.054
Dividend Payout	-0.035 ***	-0.009	0.002	0.005	-0.031 *
Tax Shield	-0.083	-0.576	-5.160	-5.796	-0.109
Non-durables	-0.020	-0.016	-	-0.087 *	-0.020
Durables	0.005	0.045	-	-0.065	0.005
Oil and Gas	-0.015	0.001	-	-0.002	-0.016
Chem. & Construction	0.078 **	0.074 **	-	-0.030	0.078 ***
Business Equipment	0.009	0.040	-	-0.058	0.007
Regulated	0.073	0.105 **	-	-0.026	0.074 ***
Wholesale & Retail	0.043	0.055 *	-	0.092 *	0.044 **
Health	-0.005	0.024	-	-0.070	-0.006
Service & etc	-0.047	-0.014	-	-0.003 *	-0.045 **
Common	0.046	0.214	-	1.205	0.050
Dev2	-0.163	0.093	-	1.391	-0.164
Dev3	0.222	0.299 *	-	0.324 *	0.222 *
Common*Profitability	-0.681	0.036	-0.183	1.789	-0.753
Common*Asset Tangibility	0.115	-0.286	-0.319	-0.701	0.113
Common*Tax Shield	0.325	0.271	4.670	4.825	0.317
Common*Growth Opport.	0.796 *	0.372	0.649	0.517	0.863
Common*Earnings Vol.	0.096	0.034	0.005	-0.295	0.105
Common*Firm Size	-0.024	-0.015	-0.047	-0.175	-0.024
Dev2*Earnings Vol.	0.210 **	0.046	-0.007	-0.260	0.210
Dev3*Earnings Vol.	0.089	0.016	0.031	0.050	0.086
Dev2*Div. Payout	0.009	0.004	-0.006	0.010	0.005
DEV3*Div. Payout	0.048 ***	0.010	-0.007	-0.018	0.044 *
Dev2*Growth Opport.	0.623	0.377	0.662	0.592	0.671
DEV3*Growth Opport.	-0.321	-0.056	-0.011	0.179	-0.347 **
Dev2*Firm Size	0.018	0.010	-0.097	-0.184	0.019
DEV3*Firm Size	-0.019	-0.030	0.006	-0.045	-0.018
DEV2*Profitability	-0.907 *	-0.381	-0.560	1.565	-0.970
DEV3*Profitability	0.077	-0.205	-0.244	-0.040	0.078
DEV2*Asset Tangibility	-0.030	-0.365 *	-0.425	-0.908	-0.031
DEV3*Asset Tangibility	-0.069	-0.074	-0.168	-0.203	-0.067
DEV2*Tax Shield	0.185	-0.028	4.410	4.930	0.227
DEV3*Tax Shield	-1.330	-0.872	-0.539	0.823	-1.320
Constant	0.346 **	0.115	-0.289 *	-1.127	0.328
F-statistic	5.120 ***	-	2.700 ***	-	-
Chi2	-	67478 ***	-	524.24 ***	368.01 ***
Hausman Test	-	45.850 *	45.850 *	-	-
N	1696	1696	1696	1664	1696

Notes: The table reports the regression results for short-term, long-term and total leverage using Ordinary Least Square (OLS), Random Effects (RE), Fixed Effects (FE), system Generalized Method of Moments (GMM) and Seemingly Unrelated Regression (SUR). The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 2.12: Firm, industry, institutional and macroeconomic factors and capital structure

	Panel A: Dependent Variable – Short term Leverage				
	Model A	Model B	Model C	Model D	Model E
Earnings Volatility	-0.012	-0.046	-0.010	-0.008	-0.0114
Firm Size	0.030 ***	0.027 **	0.033 ***	0.031 ***	0.0306 ***
Profitability	-0.096	-0.067	-0.073	-0.087	-0.0910
Growth Opt.	0.015	0.001	0.014	0.020	0.0199
Asset Tangibility	-0.265 ***	-0.247 ***	-0.264 ***	-0.258 ***	-0.2650 ***
Dividend Payout	-0.002	-0.003	-0.005	-0.004	-0.0046
Tax Shield	-0.099	-0.242	-0.070	-0.208	-0.0767
Non-durables	-0.005	-0.024	-0.002	-0.004	-0.0054
Durables	0.015	0.028	0.019	0.013	0.0187
Oil and Gas	0.003	-0.039	0.019	-0.002	0.0092
Chemicals & Const.	0.068 **	0.069 **	0.068 **	0.068 **	0.0689 **
Business Equip.	0.035	0.007	0.043	0.024	0.0452
Regulated	0.009	0.005	0.011	0.007	0.0059
Wholesale & Retail	0.065 **	0.022	0.064 **	0.051	0.0648 **
Health	-0.004	-0.017	-0.005	-0.003	-0.0001
Service & etc	-0.032	-0.055 *	-0.034	-0.034	-0.0326
Economic Growth	0.001	-0.004	0.007	0.002	
Shareholder Rights	0.017 *			0.012	
Rule of Law	-0.082 ***				
Taxation		0.002			
Stock Market Liq.		-0.098			
Inflation			0.010 ***		
Stock Market Size			-0.006		
Banking Sector Size				-0.131 ***	
Creditor Rights					0.0195 **
Size of Economy					-0.1010 ***
Constant	0.164	0.201	0.159 *	0.260 *	0.0000
Chi-square Statistic	400.68 ***	152.320 ***	391.800 ***	380.560 ***	6185.04 ***
Test for time effect	10.68 *	4.77	21.700 ***	13.940 *	10.8800
R-square	0.219	0.215	0.211	0.207	0.215
No. of Obs.	1432	556	1462	1456	1462

Table 2.12: (Cont'd . . .)

	Panel B: Dependent Variable – Long term Leverage				
	Model A	Model B	Model C	Model D	Model E
Earnings Volatility	0.036 **	0.063 ***	0.045 ***	0.047 ***	0.042 **
Firm Size	0.007	0.006	0.006	0.006	0.003
Profitability	-0.126 ***	-0.150 ***	-0.124 ***	-0.131 ***	-0.146 ***
Growth Opt.	0.006	-0.009	0.001	-0.001	0.001
Asset Tangibility	0.191 ***	0.151 ***	0.187 ***	0.178 ***	0.178 ***
Dividend Payout	-0.019 ***	-0.022 ***	-0.017 ***	-0.016 ***	-0.017 ***
Tax Shield	0.234	0.589 *	0.233	0.272	0.316
Non-durables	0.005	0.005	0.006	0.005	0.004
Durables	-0.006	-0.010	-0.006	-0.007	-0.005
Oil and Gas	0.030	0.021	0.034 *	0.034 *	0.032
Chemicals & Const.	0.017	0.011	0.016	0.016	0.016
Business Equip.	-0.017	-0.041 *	-0.016	-0.022	-0.007
Regulated	0.088 ***	0.072 ***	0.088 ***	0.088 ***	0.083 ***
Wholesale & Retail	0.012	-0.001	0.020	0.008	0.014
Health	0.001	0.024	0.003	0.002	0.005
Service & etc	-0.017	-0.015	-0.012	-0.016	-0.017
Economic Growth	-0.003	-0.016 ***	0.002	-0.002	
Shareholder Rights	0.024 ***			0.022 ***	
Rule of Law	-0.017				
Taxation		-0.001			
Stock Market Liq.		0.113 *			
Inflation			0.002		
Stock Market Size			0.028 ***		
Banking Sector Size				-0.059 **	
Creditor Rights					0.031 ***
Size of Economy					0.052 **
Constant	0.000	0.000	-0.087	-0.175 *	-0.335 *
Chi-square Statisitc	1324.810 ***	578.020 ***	388.870 ***	424.900 ***	436.260 ***
Test for time effect	21.740 ***	25.350 ***	11.010	35.210 ***	30.700 ***
R-square	0.224	0.238	0.205	0.220	0.224
No. of Obs.	1462	583	1510	1504	1510

Table 2.12: (Cont'd . . .)

	Panel B: Dependent Variable – Total Leverage				
	Model A	Model B	Model C	Model D	Model E
Earnings Volatility	0.025	0.014	0.033	0.038	0.030
Firm Size	0.040 ***	0.040 ***	0.044 ***	0.042 ***	0.039 ***
Profitability	-0.195 **	-0.200 ***	-0.168 *	-0.185 **	-0.206 **
Growth Opt.	0.017	0.045	0.006	0.001	0.012
Asset Tang/Maturity	-0.052	-0.073	-0.056	-0.051	-0.062
Dividend Payout	-0.021 ***	-0.024 ***	-0.022 ***	-0.021 ***	-0.021 ***
Tax Shield	0.027	0.254	0.072	-0.105	0.108
Non-durables	-0.002	-0.021	0.002	-0.002	-0.004
Durables	0.014	0.025	0.019	0.011	0.019
Oil and Gas	0.029	-0.015	0.052	0.025	0.037
Chemicals & Const.	0.090 **	0.089 **	0.089 **	0.091 ***	0.090 **
Business Equip.	0.027	-0.015	0.038	0.010	0.048
Regulated	0.096 **	0.094 **	0.099 **	0.095 **	0.088 *
Wholesale & Retail	0.071 **	0.008	0.075 **	0.047	0.071 *
Health	-0.001	0.015	-0.001	0.001	0.006
Service & etc	-0.053 *	-0.075 **	-0.052	-0.056 *	-0.055 *
Economic Growth	-0.004	-0.024 **	0.007	-0.009	
Shareholder Rights	0.041 ***			0.035 ***	
Rule of Law	-0.108 ***				
Taxation		0.001			
Stock Market Liq.		-0.019			
Inflation			0.013 ***		
Stock Market Size			0.016		
Banking Sector Size				-0.220 ***	
Creditor Rights					0.049 ***
Size of Economy					-0.067 *
Constant	0.000	0.206	-0.010	0.218 *	0.000
Chi-square	7237.500 ***	89.910 ***	225.870 ***	263.710 ***	7356.770 ***
Test for time effect	4.680	11.560 *	31.710 ***	8.530	15.630 **
R-square	0.156	0.139	0.134	0.153	0.153
No. of Obs.	1433	556	1463	1457	1463

Notes: The table reports the regression results for short-term, long-term and total leverage using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

CHAPTER 3

WHAT DETERMINES THE ADJUSTMENT SPEED OF CAPITAL STRUCTURE OF FIRMS TOWARD A TARGET?

3.1 Introduction

The issue of basic capital structure of a firm has engaged the attention of academics and practitioners alike for some time now. In Chapter 2, the thesis explored mainstream capital structure theories and empirical works to identify firm, industry, institutional and macroeconomic factors that determine basic capital structure. It extended the debate on capital structure a step further by empirically examining the role of institutional and macroeconomic contexts and firm- and industry-characteristics on capital structure decisions of firms within the African setting. The capital structure literature is inundated with similar endeavours that attempt to investigate the determinants of observed capital structure of a firm. While such studies certainly advance our understanding of a firm's financing behaviour, they do not address whether firms rebalance their capital structure over time. This dimension of capital structure research was intentionally postponed to be addressed in the present chapter.

A closer look at the mainstream capital structure theories indicates that while one camp suggests the existence of a target capital structure at firm level, others do not. For instance, the traditional trade-off theories that stress various costs and benefits of debt imply the existence of an optimal capital structure. According to this camp, when firms are perturbed from the optimum capital structure they respond by rebalancing their capital structure back to the optimal level. On the other hand, the market timing theory by Baker and Wurgler (2002) suggests a firm's capital structure is a cumulative result of its historical efforts to time equity issuances with high market valuations than the result of a dynamic

optimizing strategy. Similarly, the inertia theory by Welch (2004) suggests that equity price shocks have a persistent effect on leverage which he takes as evidence against firms rebalancing their capital structures toward an optimum. Likewise, the pecking order theory of Myers (1984) and Myers and Majluf (1984) considers leverage to be primarily a result of a firms' historical profitability and investment opportunities and hence firms have no strong tendencies to reverse shocks to capital structure caused by financing needs and earnings growth. Therefore, recent empirical capital structure researches attempt to discriminate between the capital structure theories by testing whether a target leverage ratio does exist.

Recent empirical literature documents evidence that market imperfections and adjustment costs and/or benefits cause firms to be at a sub-optimal capital structure. It further suggests that, in perfect markets where there is no friction, the adjustment of capital structure towards a target is costless, and thus, a firm can instantly adjust its capital structure toward the optimum. However, in imperfect markets, the adjustment of capital structure toward the optimal is costly, and hence, a firm may not adjust its capital structure instantly, but adjust partially (e.g., Heshmati 2001; Leary and Roberts 2005; Drobetz and Wanzenried 2006). The literature's attempt to empirically discriminate between trade-off and other competing theories by using dynamic trade-off theory framework and partial adjustment models has rather become promising (e.g., Elsas and Florysiak 2008). The findings, almost invariably, confirm the argument that there is a substantial dynamic component in a firm's capital structure decisions and that the dynamism depends on firm, industry, macroeconomic and institutional factors (e.g., Drobetz and Wanzenried 2006; Drobetz et al. 2007; Flannery and Hankins 2007).

In the context of Africa, there is no published work that investigates the dynamic partial adjustment of a firm's capital structure. This chapter aims to fill this gap by investigating whether firms in our sample countries adjust their capital structures to a certain

target level and, if they do, how firm, industry, macroeconomic and institutional factors impact on the speed at which firms adjust their capital structure over time. The contribution of the study presented in this chapter is threefold. Firstly, it provides an “out-of-sample-test” for the theoretical and empirical literature documented within the context of advanced economies. Secondly, it helps identify the institutions and macroeconomic policies that are conducive for enhancing the convergence of capital structure of firms in sample countries to an optimum level. Thirdly, it helps policymakers and other stakeholders in crafting policies and legislations suitable to industry and firm-specific characteristics that enhance a firm’s ability to adjust to optimal capital structure.

The chapter applies dynamic partial adjustment models on 10-years (1999-2008) data pertaining to 986 non-financial firms drawn from nine (9) African economies that have functioning stock exchanges. Model parameters are estimated using the system Generalized Method of Moments (GMM) estimator proposed by Blundell and Bond (1998). The main findings of the study are: (i) basic capital structure of firms in our sample countries does temporarily deviate from and partially adjusts to a target capital structure; (ii) effect of firm size, growth opportunities, and the gap between observed and target leverage of a firm on adjustment speed is dependent on how leverage is defined; (iii) firm profitability tends to have a robustly significant and positive effect on adjustment speed; (iv) adjustment speed is faster for firms in: (a) industries that have relatively higher risk; (b) countries with common law tradition; (c) countries with less developed stock markets; and (d) countries with weaker creditor rights protection. Finally, the evidence also indicates that adjustment speed generally tends to decrease with increase in per capita income level of countries in which the firm operates.

The remainder of the chapter proceeds as follows: section 2 presents a brief review of the literature on adjustment speed of firm's capital structure. Section 3 presents the empirical setup for analyses. Section 4 presents the results and discussions and section 5 concludes.

3.2 Literature Review

Recent literature critiques studies on determinants of capital structure on the grounds that they do not take into account the typical rebalancing behaviour of firms as far as their capital structure is concerned. It draws on dynamic trade-off theory and develops a theory for dynamic capital structure (e.g., Flannery and Hankins 2006). We may group the literature on the study of dynamic capital structure into two succinct clusters: (i) those investigating whether firms adjust towards a target capital structure; and (ii) those investigating the factors that influence the pace at which firms adjust their capital structure. In what follows, we attempt to briefly review these two clusters of the literature.

3.2.1 On the existence of a target capital structure

The literature alludes that detection of target behaviour in the capital structure of a firm is, arguably, central to discriminating between the trade-off and alternative theories. Trade-off theories that stress various costs and benefits of debt imply the existence of a target capital structure, and assume that firms make financing choices that minimize the cost of deviating from its target (e.g., Chang and Dasgupta 2009). On the other hand, the alternative theories alluded to earlier suggest that firms do not have a target capital structure that they are adjusting to achieve. In a rebuttal of the trade-off view, Miller (1977) showed that there would be no optimum capital structure at firm level by pointing to the fact that bankruptcy costs are “trivial” and also showing that the tax advantage of debt financing at the firm level

is exactly offset by the tax disadvantage of debt at the personal level²⁹. Haugen and Senbet (1978) and Barnea, Haugen and Senbet (1980) also point out that bankruptcy “penalties” are too small to offset the effect of tax advantage of debt. Nonetheless, DeAngelo and Masulis (1980), Kim (1982) and Modigliani (1982) argue that bankruptcy costs are not the only costs against which the tax advantages of debt ought to be weighed. There are other costs of debt such as agency costs, loss of non-debt-related tax-shield, etc., that should be considered in the determination of optimal capital structure.

Considerable research efforts note that firm’s capital structure decisions reflect not only the optimal leverage ratio but also rebalancing exercises toward the optimum. Myers’ (1984) view that trade-off theory suggests a target capital structure was corroborated in research efforts as early as Jalilvand and Harris (1984) which report that a firm’s financial behaviour is characterised by partial adjustment to long-run financial targets. However, Jalilvand and Harris’ work was criticized for exogenously specifying the long-run financial target to which firms adjust. After seventeen years, De Miguel and Pindado (2001) attempted to improve on Jalilvand and Harris’ work by endogenizing the target capital structure in their model and conclude that firms adjust their capital structure toward an optimum. De Miguel and Pindado’s model estimates a time-invarying adjustment speed though. At about the same time, through a survey of corporate finance practices of firms, Graham and Harvey (2001) show that 81 per cent of the CFOs in their sample responded to having either a target range of debt ratio or a “strict” target debt ratio.

Rather recently, Fama and French (2002), note that firm’s debt ratio adjust slowly toward their targets. This observation is consistent with the suggestion by Myer (1984) that firm’s may take long time to return to their target capital structure in the presence of costs of adjustment. In a rebuttal of the works of Baker and Wurgler (2002) and Welch (2004), Leary

²⁹ See Haugen and Senbet (1978); Barnea, Haugen and Senbet (1980); DeAngelo and Masulis (1980); Kim (1982); and Modigliani (1982) for elaborate discussion on the [ir]relevance of bankruptcy costs to capital structure decisions.

and Roberts (2005) show that firms actively rebalance their leverage to stay within the optimal range. In a further push, more recent literature, employing models and procedures that are more robust, confirms not only that firms adjust their capital structure but also identify that adjustment costs and benefits enhance or mitigate the speed at which firms adjust their capital structure toward the optimum (e.g., Banerjee, Heshmati and Wihlborg 2004; Gaud, Jani, Hoesli and Bender 2005; Leary and Roberts 2005; Drobetz and Wanzenried 2006; Flannery and Rangan 2006; Frank and Goyal 2007b; Huang and Ritter 2009; Fualkendar, Flannery, Hankins and Smith 2011).

Although copious empirical studies endeavour to investigate adjustment speed of capital structure, Shyam-Sunder and Myers (1999) and Chen and Zhao (2007) caution against overly interpreting adjustment coefficients by pointing to the possibility that “firm’s leverage ratios tend to revert to mean *mechanically* regardless of the firm’s financing preferences”. However, a number of other widely employed tests are also susceptible to mechanical effects that could arise when firms do not follow target behaviour (e.g., Chang and Dasgupta 2009).

3.2.2 On the determinants of adjustment speed of capital structure

In a recent paper, Faulkender et al. (2011) re-iterate a contemporary question in capital structure research: whether firms have a target level of leverage, and if so, what factors enhance (or hinder) the speed with which firms adjust their capital structure towards a target? Various endeavours to obtain answers for the above question suggest that the speed at which firms adjust their capital structure toward a target varies from study to study. Part of the dissention has to do with the econometric procedures employed and part of it could also be ascribed to differences in adjustment costs and/or benefits. The later view was reflected in Flannery and Hankins (2007) who remark that capital structure decisions reflect not only the level of the optimal leverage ratio but also both the costs of deviating from the target and the

costs of adjusting toward that target. According to them, whilst adjustment costs hinge on external financing expenses, stock price movements and financial constraints adjustment benefits depend on potential costs of distress and the value of tax shields. In what follows, we present a synthesis of the influence of firm-, industry-, and country-characteristics on adjustment costs and benefits, and thereby, on adjustment speed.

3.2.2.1 Inter-firm heterogeneity in adjustment speed of basic capital structure

As the adjustment costs and/or benefits are likely to vary from firm to firm, so does the optimal capital structure adjustment process (e.g., Flannery and Hankins 2007). Studies as early as Fischer, Heinkel and Zechner (1989) propose a model of dynamic capital structure choice in the presence of adjustment costs and show that the swings in capital structure are functions of firm-specific factors. The following paragraphs present synthesis of the relationship between firm characteristics and adjustment speed by using adjustment costs and/or benefits as a framework.

The capital structure literature customarily suggests that larger firms tend to have lower information asymmetry which enables them to have lower financing costs as they are likely to enjoy better access to external finance. As alluded to earlier, the lower the financing cost of a firm is the lower its capital structure adjustment cost. Thus, we expect larger firms to have smaller adjustment costs and faster adjustment speed (e.g., Banerjee et al. 2004; Drobetz and Wanzenried 2006; Flannery and Hankins 2007). On the other hand, one might argue that larger firms tend to have less cash flow volatility, which reduces the potential costs of distress (e.g., Flannery and Rangan 2006). A reduction in potential cost of distress in turn reduces a firm's benefit of adjusting toward a target capital thereby reducing the adjustment speed (e.g., Flannery and Hankins 2007). Although Flannery and Hankins (2007) report a

positive relationship between firm size and adjustment speed, Haas and Peeters (2006) and Banerjee et al. (2004) observe an inverse relationship between the two variables.

According to Flannery and Hankins (2007), profitability impacts both the costs and/or benefits of capital structure adjustment of a firm. A more profitable firm is likely to have more flexibility (i.e., lesser constraints) in financing decisions and also likely to enjoy issuance of securities at more attractive rates (i.e., lower cost of external financing). This signifies that more profitable firms are likely to experience lesser costs of rebalancing their capital structure toward a target. In addition, higher profit may also increase the value of debt tax-shields or minimize asset substitution concerns (i.e., increase benefits of adjustment); especially if the firm is under-leveraged (see Flannery and Hankins 2007). Thus, we conjecture the profitability of a firm to positively influence the pace at which a firm adjusts its capital structure to a target.

Both Banerjee et al. (2004) and Drobetz and Wanzenried (2006) suggest that growing firms tend to have more flexibility in choosing the sources of finance than no-growth firm which can only change their capital structure by swapping debt against equity. This in turn implies that growing firms are likely to enjoy lesser financing constraints and hence are likely to more rapidly rebalance their capital structure toward a target level. Although Drobetz and Wanzenried's (2006) empirical results corroborate this conjecture, Banerjee et al.'s (2004) results indicate that firms with higher growth opportunity adjust more slowly towards the optimal capital structure. The inconsistent result obtained by Banerjee et al. (2004) could partly be due to the non-linear least square estimation technique they used to analyze the data which usually leads to biased and inconsistent estimators (Drobetz and Wanzenried 2006).

The theoretical predictions regarding the relationship between the magnitude of the distance between target and observed capital structures of a firm (i.e., the distance variable) and adjustment speed are indeterminate. If fixed costs (e.g., legal fees and investment bank

fees) constitute a major portion of the rebalancing cost, only firms which moved significantly far away from the optimal capital structure will change their capital structure. Hence, we expect a positive relationship between adjustment speed and the distance variable (e.g., Banerjee et al. 2004; Drobetz and Wanzenried 2006)³⁰. On the other hand, if the fixed costs of adjustment are prohibitively high, firms may avoid using capital markets to raise funds and manoeuvre their dividend policy to rebalance their capital structure. In this case, cost of adjustment tends to be increasing with increase in the distance variable implying slower adjustment speed. While Drobetz and Wanzenried (2006) report a statistically weak but positive relationship, Banerjee et al. (2004) report mostly insignificant (but significantly negative for UK) relationship between the two variables. Finally, a recent strand of research also reports links between cash flows and adjustment speed. Both Byoun (2008) and Faulkender et al. (2011) note that a firm's financial need is a critical determinant of the pace at which they adjust their capital structure toward a target.

3.2.2.2 Inter-industry heterogeneity in adjustment speed of basic capital structure

Empirical researches that explicitly examine inter-industry heterogeneity in adjustment speeds are scant. However, some studies control for industry effects (e.g., Hovakimian, Hovakimian and Tehranian 2004; Flannery and Rangan 2006) to account for inter-industry differences in adjustment speeds. Roberts (2002) analysed capital structure dynamics using a system of stochastic differential equations and showed that the speed at which firms revert back to their target capital structures varies dramatically across industries suggesting the existence of significant inter-industry variation in adjustment costs and/or benefits. Likewise, by employing a dynamic adjustment model, Banerjee et al. (2004) compare the adjustment speed of firms in various industries and report that there are

³⁰ Leary and Roberts (2007) provides an elaborate discussion on the implication of the structure of adjustment cost on capital structure adjustment speed.

substantial differences in adjustment speeds across industries in the US and UK. In a similar vein, Smith, Chen and Anderson (2010) estimate adjustment speeds of capital structure of 15 industries within the New Zealand milieu and show that firms within the agriculture and fisheries, mining, forestry, media and communications, and investment industries move toward their target capital structure relatively rapidly, in comparison to other industries. They suggest that risk characteristics of the industry in which a firm operates might be the underlying factor explaining inter-industry differences in adjustment speeds. In a similar vein, Stoja and Tucker (2007) classify industries into “new economy” group which include biotechnology, IT and leisure industries and “old economy” group which includes oil and mining, construction, textiles and real estate industries. The authors propose that adjustment costs for firms in “old economy” industries are likely to be higher as they are fixed assets intensive with low level of service element whereas firms in “new economy” industries are likely to adjust faster since they are R&D intensive with high levels of service element. Thus, we expect that in as much as industry characteristics influence a firm’s capital structures, so might they influence the costs and/or benefits of adjusting to (or deviating from) a target capital structure.

3.2.2.3 Cross-country heterogeneity in adjustment speed of capital basic structure

Most of the prior empirical evidence that firms partially adjust toward a target capital structure is based on single-country data. However, the speeds of adjustment reported vary considerably around the world. While a number of papers find evidence of relatively slow adjustment speeds, others report faster speeds. Studies which report low adjustment speeds include Fama and French (2002) who report that US firms move towards target debt ratios at speeds ranging from 7 to 18 per cent each year. Similarly, Hovakimian and Li (2009), using various target proxies and modifications to the standard methodologies, estimate adjustment

speeds ranging from 5 to 13 per cent. Consistent with faster speeds reported in earlier studies such as Jalilvand and Harris (1984), Shyam-Sunder and Myer (1999) and Flannery and Rangan (2006) report adjustment speeds of 41 per cent and 34 per cent, respectively, for firms in the US. According to Ozkan (2001), the adjustment speed of capital structure of UK firms is in the vicinity of 43 per cent. There are also studies [e.g., De Miguel and Pindado (2001) and Gaud et al. (2005) for Swiss firms and Lemmon, Roberts and Zender (2008) and Huang and Ritter (2009) for US firms] which report adjustment speeds that lie at the middle of the spectrum. Part of the dissension in the adjustment speeds stems from econometric issues. But econometric issues may not explain all of the variation in the speed of adjustment. This variation in the observed adjustment speeds in different countries opened a further research direction in which many researchers attempted to examine the nexus between country characteristics and the pace at which firms adjust their capital structure.

In a series of influential works on the association between law and finance, La Porta et al. (e.g., 1996; 1997; 1998; 1999) document that the legal rules and the quality of their enforcement are important determinants of the shape and complexity of financial contracts pertaining to debt and equity. At the heart of their argument is the legal protection afforded by legal systems to mitigate agency problems between insiders and outsiders to the firm. Investors' disposition towards providing funding for firms partly depends on the protection they receive from the legal system. The authors show that legal systems based on the English common law provide a stronger protection to investors (i.e., shareholders and creditors) than those based on the French civil law. The empirical literature seems to confirm this prediction. Thus, firms in countries with legal systems based on the English common law tend to have lesser agency-associated problems compared to those in countries with legal systems based on the French civil law. Therefore, we expect firms in the first group of countries to more quickly adjust their capital structure to a target than those in the latter group. Following Clark

et al. (2009) and Wanzenried (2006), we also anticipate that firms located in countries with strong creditor and shareholder rights and relatively high levels of contract enforcement efficiency would adjust their capital structures more quickly than firms located in countries characterized by lower levels of creditor and shareholder rights and less efficient means of enforcing contracts.

Prior literature also attempts to explain variations in adjustment speeds by invoking cross-country divergence in financial systems. Developed stock markets and banking sector makes it easier for firms to raise capital. The likely smaller transaction costs and reduced agency costs associated with developed stock markets and banking sector would mean that firms find it easier to adjust their capital structure to the target (e.g., Grossman and Stiglitz 1980; Demirgüç-Kunt and Maksimovic 1999; Wanzenried 2006; Clark et al. 2009). Hence, we conjecture that the size and liquidity of stock markets and the size of banking sector have positive effects on the speed at which firms adjust their capital structure to a target.

To test the impact of macroeconomic conditions on the speed of capital structure adjustment, prior empirical literature employs such factors as overall size of the economy, GDP growth rate, inflation rate, and taxation that define macroeconomic conditions. The GDP growth rate is usually considered as an indicator of financing needs of firms (e.g., Demirgüç-Kunt and Maksimovic 1999). Thus, in line with Cook and Tang (2010), Drobetz and Wanzenried (2006), and Wanzenried (2006), we expect firms to adjust their capital structure to a target at a faster rate as the economy goes through higher GDP growth.

According to Mills (1996), higher inflation rate increases the cost of capital and changes in the cost of capital are paid closer attention by firms so that they can optimize their capital structure. Hence, consistent with Wanzenried (2006), we expect higher inflation rates to have a positive influence on adjustment speed. The dynamic trade-off theory predicts that adjustment speed is positively related to the benefits of being at a target capital structure.

Thus, the higher the benefit resulting from untapped tax benefits, the faster the pace at which a firm adjusts its capital structure (e.g., Clark et al. 2009). As in the legal institutions, we examine the effect of macroeconomic conditions on the speed of adjustment in two stages. We first examine if there are variation in adjustment speeds across broadly defined income groups (i.e., upper-middle-income; lower middle income, and low-income countries) to which the country belongs. Second, we examine the effect of more narrowly defined macroeconomic variables (i.e., taxation, inflation, size of economy, and growth rate of GDP) on adjustment speed.

3.3 The Empirical Framework

Prior empirical works indicate that firm, industry, and country-level factors impact on firm's capital structure decisions (e.g., Rajan and Zingales 1995; Demirgüç-Kunt and Maksimovic 1999; Booth et al. 2001). Nonetheless, until recently, international work on capital structure imposes the implicit, but unrealistic, assumption that firms are always at their target capital structure. In an imperfect environment where there are a set of adjustment costs and/or benefits, a firm's capital structure may not necessarily be at a target level. In an effort to properly account for the dynamic nature of capital structure, recent literature adopted a dynamic partial adjustment model which allows target capital structure to vary across firms and over time (e.g., Fischer et al. 1989; Hovakimian, Opler and Titman 2001; Drobetz and Wanzenried 2006). The pace at which firms adjust their capital structure towards a target is the main stay of this chapter.

The literature also documents that adjustment speed measure is very sensitive to the econometric design. Econometric challenges include, among others, problems of model specification, unobservable variables, heterogeneous panel data, short panel biases, autocorrelation and unbalanced panels (e.g., Zhao and Susmel 2008). Two distinct strands of

econometric modelling approaches stand out in the study of adjustment speed of capital structure: the two-stage and integrated dynamic partial adjustment capital structure models (e.g., Cook and Tang 2010). Although both approaches are widely used, Flannery and Rangan (2006) convincingly shows that the two-stage dynamic panel adjustment model results in abnormally smaller estimates of adjustment speed than theory would predict. Further, this approach does not allow us to examine the determinants of adjustment speed while the integrated approach enables us to jointly determine the adjustment speed along with its determinants. Hence, this chapter adopts the integrated dynamic partial adjustment model.

3.3.1 Model specification

In line with De Miguel and Pindado (2001) and Hovakimian et al. (2001), we define target capital structure as a leverage ratio that a firm would desire to have in a frictionless environment. To analyse the impact of firm, industry and country characteristics, taking a cue from Drobetz and Wanzenried (2006) and Öztekin and Flannery (2008), we specify target capital structure using a dynamic capital structure model. Let the optimal or target capital structure of firm i in period t , labelled as $Lev_{i,t}^*$, be a linear function of a set of N explanatory variables, $K_{j,i,t}$ (where $j = 1, 2, 3, \dots, N$) that have been used in past cross-sectional studies of capital structure:

$$Lev_{i,t}^* = \sum_{j=1}^N \theta_j K_{j,i,t} \quad (1)$$

where θ_j denotes a column vector containing the coefficients of explanatory variables.

Since factors that determine a firm's optimal capital structure may vary across firms and change over time, it is likely that the optimal capital structure itself may vary across firms and change over time. Hence, the dynamic set up in Equation (1) allows target capital structure across firms and over time.

In a frictionless environment where information asymmetries, transaction costs and other adjustment costs and/or benefits are absent, firms may instantly adjust their capital structure to a target. Hence, in such an environment, observed capital structure ($Lev_{i,t}$) is expected to be the same as target capital structure ($Lev_{i,t}^*$). In other words, in a perfect environment, the difference between the current and the previous periods' observed leverage should be the same as the difference between target leverage and the pervious period's leverage. That is, $Lev_{i,t} - Lev_{i,t-1}$ should be equal to $Lev_{i,t}^* - Lev_{i,t-1}$. However, in the presence of all sorts of adjustment costs and/or benefits (which is more likely in the real world), $Lev_{i,t}$ is not necessarily the same as $Lev_{i,t}^*$. That is, firms may not fully adjust their capital structure to the target capital structure. They may rather adjust partially. Thus, the equality is disrupted and a more realistic partial adjustment model may be specified as:

$$(Lev_{i,t} - Lev_{i,t-1}) = \gamma_{i,t}(Lev_{i,t}^* - Lev_{i,t-1}) + \varepsilon_{i,t}, \text{ where } 0 < |\gamma_{i,t}| < 1 \quad (2)$$

where $\gamma_{i,t}$ denotes the adjustment parameter representing the magnitude of adjustment toward a target capital structure between two consecutive periods, $Lev_{i,t-1}$ represents capital structure of firm i , in period $t-1$, and $\varepsilon_{i,t}$ denotes the idiosyncratic error term. Rearranging the terms in Equation (2), we obtain:

$$Lev_{i,t} = (1 - \gamma_{i,t})Lev_{i,t-1} + \gamma_{i,t}(Lev_{i,t}^*) + \varepsilon_{i,t}, \text{ where } 0 < |\gamma_{i,t}| < 1 \quad (3)$$

Our model follows Drobetz and Wanzenried (2006) and Hovakimian et al. (2001), where firms adjust their capital structure to an endogenously determined capital strucure as specified in Equation (1). Taking cues from prior empirical work (e.g., Drobetz and Wanzenried 2006; Flannery and Rangan 2006; Cook and Tang 2010), we specify adjustment speed ($\gamma_{i,t}$) as a linear function of factors affecting the costs and benefits of adjustment and the unobserved firms-specific effects as follows:

$$\gamma_{i,t} = \omega_0 + \omega_1 X_{i,t} \quad (4)$$

When firm-specific variables are used to explain the speed of adjustment, $X_{i,t}$ has both time and cross-sectional dimensions. In contrast, in the case of macro-economic variables, $X_{i,t}$ has only time dimension as macroeconomic variables do not vary across firms.

Substituting Equation (4) and Equation (1) in Equation (3), we obtain:

$$Lev_{i,t} = [1 - (\omega_0 - \omega_1 X_{i,t})] Lev_{i,t-1} + (\omega_0 + \omega_1 X_{i,t}) (\sum_{j=1}^N \theta_j K_{j,i,t} + \varepsilon_{i,t}) \quad (5)$$

Partly multiplying Equation (5) out, we obtain:

$$Lev_{i,t} = (1 - \omega_0) Lev_{i,t-1} - \omega_1 X_{i,t} Lev_{i,t-1} + \omega_0 \sum_{j=1}^N \theta_j K_{j,i,t} + \omega_1 \sum_{j=1}^N \theta_j K_{j,i,t} + \varepsilon_{i,t} \quad (6)$$

When Equation (6) is estimated, interest is mainly in ω_1 which is the coefficient of the interaction term between the determinant variable of adjustment speed, $X_{i,t}$, and the lagged leverage, $Lev_{i,t-1}$. Following precedence, we formulate the null hypothesis that $\omega_1 = 0$, i.e., the speed of adjustment is independent from firm, industry, and/or country characteristics.

3.3.2 A brief comment on the estimation procedures

We observe in the literature that varying econometric procedures are used to estimate Equation 6 and results are non-robust to econometric procedures (e.g., Frank and Goyal 2007b). Estimating Equation (6) using OLS would result in biased estimates of coefficients as it ignores fixed effects (e.g., Frank and Goyal 2007b; Antoniou et al. 2008). If the only problem surrounding the estimation was the fixed effect, consideration of either fixed or random effects estimation procedure would have mitigated the problem. In fact, Flannery and Rangan (2006) used fixed effects estimation procedure to estimate capital structure adjustment speed. However, endogeneity is another common problem that plagues

researchers in capital structure research (e.g., Parsons and Titman 2007; Getzmann, Lang and Spremann 2010). To overcome the problem of endogeneity, Anderson and Hsiao (1982) propose the use of an instrumental variables (IV) technique in which two-period lagged dependent variables are used as instrument. However, Antoniou et al. (2008) note that this procedure is unlikely to provide efficient estimates since it doesn't use all the related moment conditions and also doesn't accounts for the differenced structure of the error term. Arellano and Bond (1991) suggest using a dynamic panel data estimator based on the GMM methodology that optimally exploits the linear moment restrictions implied by the dynamic panel model. GMM estimator uses both lagged values of all endogenous regressors and lagged and current values of all strictly exogenous regressors as instruments. Models can be estimated using the levels or the first differences of the variables. For the difference estimator, the variables are measured as first differences and their lagged values are used as appropriate instruments. However, one has to check that there is no second-order serial correlation in the first differences of the error term as the consistency of the GMM estimator requires that this condition be satisfied. Further the validity of instruments is verified using the Sargan test of over identifying restrictions.

According to Blundell and Bond (1998) lagged levels of variables are likely to be weak instruments for current differenced variables when the series are close to random walk. In these conditions, the differenced GMM estimates are likely to be biased and inefficient. The authors suggest the use of a more efficient system GMM estimator that combines the difference-equation and a levels-equation in which suitably lagged differenced variables are the appropriate instruments. The system GMM is consistent and more efficient than the difference estimator so long as there is no significant correlation between the differenced regressors and country fixed effects. Specifically, Antoniou et al. (2008) and Deesomsak et

al. (2009) demonstrate that system-GMM is the most appropriate method to estimate Equation (6). Hence, we use the system-GMM to obtain the parameter estimates.

3.4 Results and Discussions³¹

3.4.1 Descriptive Statistics

The salient features of capital structures of sample firms over the study period were identified and discussed in Chapter 2. This section re-iterates some of those features which have a direct relevance to our forgoing discussion on capital structure adjustment speed. For the sake of convenience, Table 3.1 reproduces the summary statistics which were presented in Table 2.1. There are three important features of the capital structure of the sample firms which are worth mentioning at this stage. Firstly, independent of how leverage is defined, we note that the leverage ratios were varying over time. This could be considered as an initial suggestion that firms might be attempting to adjust their capital structure toward a target.

Secondly, we observe an overall upward trend in all the three measures of leverage throughout the sample period. Total leverage, for instance, increased from 41.3 per cent in 1999 to 47.6 per cent in 2008 while long-term leverage went from 9.9 per cent to 13.9 per cent over the same period. This could be ascribed to a confluence of increasing size and growth rate of the economies of sample countries (e.g., Booth et al. 2001; De Jong et al. 2008); increasing size and liquidity of stock markets (e.g., Demirgüç-Kunt and Maksimovic 1999; Wanzienried 2006); and increasing inflationary situations (e.g, Taggart 1985; Frank and Goyal 2007a) over the same period. This phenomenon could as well be due to the steady increase in profitability, growth opportunities, and dividend payout factors (e.g, Barclay and Smith 1999; Benito 2003; Deesomsak et al. 2004; Mazur 2007; Antoniou et al. 2008).

(Insert table 3.1 about here)

³¹ We used the same dataset as in Chapter 2 for the analysis in this Chapter.

Thirdly, short-term leverage was on the decline over the second half of the sample period. This may be due to the increase in the size and liquidity of stock markets over the sample period which may have enticed quoted firms to switch to using more long-term than short-term debt (e.g., Deesomsak et al. 2009). It could as well be owing to the observed increase in firm-specific factors such as size, profitability, and growth opportunities over the sample period (e.g., Smith and Warner 1979; Barclay and Smith Jr 1995; Ozkan 2002; Antoniou et al. 2006; Deesomsak et al. 2009). Overall, the three salient features identified signify that the capital structure of the sample firms exhibited a dynamic behaviour during the period under study.

In the pairwise correlation matrices reported in Chapter 2 (i.e., Table 2.2), it was noted, for our sample firms, that the correlations between all the three measures of leverage and firm- and country-characteristics are in sync with main stream capital structure theories and most empirical findings. It was also noted that the correlation coefficients between country-specific determinants of speed of capital structure adjustment are very high. To keep the estimation problem tractable and avoid problems of multicollinearity when estimating Equation (6) in the presence of high correlations, we develop slightly different specifications of Equation (6) by excluding highly correlated variables³².

The estimation of the dynamic model in Equation (6) crucially hinges on the correct specification of the model for target capital structure. Findings reported using a series of models in Chapter 2 indicate that the relationship between the firm- and country-specific variables and the various measures of leverage are broadly in tandem with main stream capital structure theories. They also sit well in the ‘club of many other efforts’ within the context of developed and developing countries. Furthermore, all of the model fit tests (see the F-statistic and the Chi-square statistic in Tables 2.8, 2.9, 2.10, 2.11 and 2.12) showed that the

³² The reader is kindly reminded that an extended discussion on correlation between firm- and country-level variables and a firm’s capital structure is available in chapter 2.

independent variables adequately explain the dependent variables. In summary, our results are comparable to those in other similar studies and they indicate that the explanatory variables are appropriate to model a time varying target leverage ratio in a dynamic adjustment model.

3.4.2 Determinants of adjustment speed of basic capital structure

In this section, we report dynamic panel estimation results from Equation (6). Dynamic panel estimation using system-GMM allows estimation of all coefficients in Equation (6) simultaneously. We begin our analysis by perusing the results for our baseline regression model (Model 1) which specifies only firm-specific factors as the independent variables. Table 3.2 presents the system GMM estimate of Model 1.

(Insert table 3.2 about here)

As indicated in an earlier section, our focus is on the estimates of $(1 - \omega_1)$ and ω_1 . While $(1 - \omega_1)$ shows the movement of leverage to its target, ω_1 indicates whether the speed of adjustment is independent of firm- and country-specific factors. The estimates of $(1 - \omega_1)$ for short-term, long-term, and total leverage were 0.461, 0.410, and 0.606, respectively. This implies that firms in our sample countries close by 53.9 $(1-0.461)$, 59 $(1-0.410)$, and 39.4 $(1-0.606)$ per cent the gap between current and target short-term, long-term, and total-leverage, respectively, within one year. At these rates, a firm takes roughly two years to reach its target capital structure. Such a rapid adjustment towards a target capital structure suggests the existence of trade-off theory and rules out the dominance of rival theories proposed by Baker and Wurgler (2002) and Welch (2004). It also suggests the presence of costly and non-instantaneous adjustment towards target capital structure (e.g., Leary and Roberts 2005; Flannery and Hankins 2007). Our results are consistent with the relatively faster adjustment

speeds reported in Shyam-Sunder and Myer (1999), Flannery and Rangan (2006) for firms in the US and Mukherjee and Mahakud (2010) for Indian companies.

3.4.2.1 Firm-specific determinants of adjustment speed of basic capital structure

A perusal of the estimates of ω_1 in Table 3.2 reveals that the nexus between distance variable ($\text{Dist}_{i,t}$) and speed of adjustment is dependent on how leverage is defined. The further the observed short-term and total leverage ratios are from the target, the faster their speeds of adjustment. These results confirm the idea that a firm's cost of maintaining a sub-optimal capital structure is higher than the cost of adjustment and the fixed costs of adjustment are not significant. We observe that Drobetz and Wanzenried (2006) and Mukherjee and Mahakud (2010) reported similar results. On the other hand, the negative relationship between adjustment speed of long-term leverage and the $\text{Dist}_{i,t}$ variable suggests that adjustment costs (i.e., cost of external financing, transaction costs, etc.) were prohibitively high for our sample firms that they were avoiding accessing capital markets and rather were changing their dividend policy to rebalance their capital structure. In situations where firms sidestep capital markets to adjust their capital structure, they may take "extended excursions away from the optimal capital structure" and only adjust their capital structure slowly as part of their normal operation while larger adjustments require new issues of securities (e.g., Loof 2004)³³.

Further, the estimated coefficients of profitability (Table 3.2) are all negative, indicating a positive association between firm profitability and the pace at which a firm adjusts its capital structure to the optimum. This is consistent with the conjecture that more profitable firms have the financial flexibility and better access to raising external finance and

³³ Note that Equation (6) specifies a negative sign on ω_1 , and therefore the signs of the estimated coefficients on the respective interaction terms must be interpreted accordingly.

hence adjust their capital structure more rapidly than less profitable firms. Similar results were reported in Flannery and Rangan (2006) and Song and Philippos (2004).

We observe that the nexus between firm size and adjustment speed is sensitive to how leverage is defined (Table 3.2); it is positive for short-term and total-leverage and negative for long-term leverage. This shows that firm size enhances adjustment speed of long-term capital structure while it deters the adjustment speed of short-term and total leverage. This implies that larger firms adjust their long-term leverage more rapidly than smaller firms. This could be ascribed to the relatively smaller transaction costs of capital market transactions that larger firms incur as compared to smaller firms.

Also evident in Table 3.2 is that the growth opportunities variable has a statistically weak and definitionally sensitive relationship with adjustment. This result is in contrast to what was reported in Drobetz and Wanzenried (2006) and doesn't allow for further interpretation. Specifically, the finding in Drobetz and Wanzenried (2006) and Mukherjee and Mahakud (2010) that growing firms adjust faster than no-growth firms couldn't be confirmed.

3.4.2.2 Inter-industry heterogeneity of adjustment speed

We now attempt to examine whether the adjustment speeds indicated in Table 3.2 persist when we estimate Model 1 on an industry-by-industry basis. System GMM regression estimation results for each industry are reported in Table 3.3 - Panel A. For reasons of brevity, we report only coefficients of lagged leverage along with the corresponding robust standard errors and number of observations.

(Insert table 3.3 about here)

The results of industry-by-industry analysis for the 10 industries indicate that adjustment speeds vary across industries regardless of how leverage is defined. On a short-

term leverage basis, firms within the Durables and Chemicals & Construction industries move toward their target capital structures relatively rapidly than is the case in other industries. The adjustment speed of short-term capital structure for these industries is about 57.5 per cent per year. On a long-term leverage basis, firms within the Health, Oil & Gas, and Regulated industries move toward their target capital structures relatively rapidly than is the case in other industries. The adjustment speeds of long-term capital structure for these industries range between 66.7 and 91.6 per cent per year. These industries generally have high levels of leverage (Table 3.3 - Panel B), which may indicate that they are of higher default risk than the other industries. When firms in these industries deviate from their target capital structure, in particular take on additional debt, they may increase their default risk even further. Consequently, they may try to adjust back towards their target capital structure faster than firms in comparatively less risky industries (e.g, Smith et al. 2010).

In contrast, on a short-term leverage basis, firms within the Business Equipment, Wholesale & Retail and Health industries adjust their capital structures relatively slowly toward their target (Table 3.3 - Panel A). On a long-term leverage basis, on the other hand, firms within the Durables, Service and Wholesale & Retail industries adjust their capital structures relatively slowly toward their target. While firms within the Health industries have low short-term leverage, those in Wholesale & Retail industries have low long-term leverages (Table 3.3 - Panel B). This points out that these industries exhibit relatively less default risk. Therefore, when firms in these industries deviate from their target capital structure, and in particular take on additional debt, they may feel less pressure to adjust back to the target quickly (e.g., Smith et al. 2010).

Broadly speaking, we observe that majority of the industries in our sample exhibit an inverse relationship between leverage (i.e., default risk) and speed of adjustment. Taking a cue from Smith et al. (2010), these findings indicate that an industry's default risk could be

the underlying factor determining adjustment speed. That is, firms in industries that have relatively high default risk tend to revert more quickly to their target capital structure than is the case in industries that have relatively low [default] risk.

3.4.2.3 Cross-country heterogeneity of adjustment speed of basic capital structure

To gain an idea about cross-country variations in adjustment speeds, we estimate Model 1 using system GMM for each of the countries included in our sample. For reasons of brevity, we report only coefficients of lagged leverage ratios³⁴. On a short-term leverage basis, our results (Table 3.4 - Panel A) show that firms in Kenya adjust at the fastest rate ($1 - 0.349 = 0.651$) while those in South Africa adjust at the slowest rate ($1 - 0.816 = 0.184$). On a long-term leverage basis, we observe that firms in Tunisia adjust at the fastest rate ($1 - 0.131 = 0.869$) while those in Morocco adjust at the slowest rate ($1 - 0.949 = 0.051$). Thus, as in the inter-industry analyses, the results of our country-by-country analyses indicate that there is, indeed, a cross-country variation in capital structure adjustment speeds independent of how capital structure is defined³⁵. These cross-country variations in adjustment speeds could be attributed to some country-level factors that explain capital structure dynamics beyond those explained by firm- and industry-specific characteristics.

(Insert table 3.4 about here)

Earlier, we hypothesized that legal institutions should determine the adjustment speed of basic capital structure of firms. To this end, we examine the dynamics by splitting our sample into firms from countries with common law and civil law traditions³⁶. We estimate Model 1 using system GMM for firms in each sub-sample. Table 3.5 reports the adjustment

³⁴ The figures in parenthesis are robust standard errors.

³⁵ The results of the other four countries including Botswana, Ghana, Mauritius, and Nigeria were not reported owing to sample size issues.

³⁶ While Botswana, Ghana, Kenya, Nigeria, and South Africa have common law legal systems, Egypt, Mauritius, Morocco, and Tunisia have civil law legal systems (La Port et al. 1997).

speeds for each sub-sample. As in the previous analyses, we report only coefficients of lagged leverage ratios.

(Insert table 3.5 about here)

La Porta et al. (1997; 1998) demonstrate that countries with common law origin provide the strongest institutions and legal protections to investors (both shareholders and creditors), while countries with civil law origin provide the weakest protection and institutions. Accordingly, adjustment costs should be lower and/or adjustment benefits higher in common law origin countries, leading to faster adjustment. Consistent with this conjecture, we observe that firms in the common law sub-sample adjust to target capital structures at a relatively faster speed than those in civil law sub-sample. Interestingly, the difference in the adjustment speeds is more vivid when one considers short- and long-term leverages separately than total-leverage. Similar results were reported in other studies (e.g., Öztekin and Flannery 2008). These variations in adjustment speeds do strengthen the hypothesis that the legal institutions influence the adjustment costs and/or benefits, and hence, the adjustment speed of capital structure of firms.

We further examine capital structure adjustment speeds by trifurcating our sample into sub-samples of income groups: upper-middle-income countries; lower-middle-income countries; and low-income countries³⁷. We consider these sub-samples because the results may reveal the influence that economic development has on basic capital structure dynamics that we couldn't capture through other variables. We carry out separate estimates of Model 1 for each sub-sample using system GMM. Table 3.6 reports the variation in adjustment speed of capital structure of firms in all the three sub-samples. For reasons of brevity, only coefficients of the lagged leverage variable are reported.

³⁷ The classification of countries by income groups is a contentious issue and surrounded by fierce debate. Different institutions (e.g., the World Bank, IMF, the economist, CIA, etc.) use different criteria for different purposes to classify countries. We use World Bank's classification based on per capita income levels.

Our results show that adjustment speeds vary across income groups independent of how leverage is defined. Specifically, on a short-term leverage basis, firms in richer countries tend to have a slower adjustment speed of capital structure than is the case in poorer countries. We observe similar results for total leverage (Table 3.6).

(Insert table 3.6 about here)

These differences in the speed of adjustment are consistent with the view that the relative costs and/or benefits of deviating from target capital structure varies across income levels. Hence, the (net) adjustment cost, based on Table 3.6, is highest for upper-middle-income countries, followed by lower-middle-income countries and low-income countries. These differences in the speed of adjustment do strengthen the idea that macroeconomic factors influence the speed of adjustment (e.g., Hackbarth, Miao and Morellec 2006; Wanzenried 2006). In contrast, this finding doesn't sit well with the proposition that firms in less developed countries actually adjust their capital structure at a slower rate than those in more developed countries.

We now proceed to examine the nexus between more-narrowly defined features of each country's macroeconomic and institutional environment by introducing a set of more-narrowly defined legal, financial, macroeconomic variables into Equation (6) – Model 2. In particular, in Model 2, we include such variables as size of the overall economy, growth rate of the economy, corporate tax rate, inflation, stock market size, stock market liquidity, size of banking sector, creditor rights protection, shareholder rights protection and rule of law. Most of these country-level variables were severely correlated that putting all of them into one model would result in multicollinearity problem.³⁸ To avoid problem of multicollinearity and also keep the estimation problem tractable, we develop variants of Model 2 (i.e., Model 2a, Model 2b,, Model 2g) each of which encompass only less severely correlated

³⁸ See the correlation matrices in Table 2.3

independent variables. Table 3.7 presents the parameter estimates and related test statistic using system GMM for each of the measures of leverage.

(Insert table 3.7 about here)

The estimated coefficient on the interaction term with the marginal corporate tax rate indicates that firms in countries with higher marginal corporate tax rates adjust faster towards their target leverage rate implying that higher untapped tax benefits enhance the pace at which firms adjust to their target capital structure. Empirical works by Öztekin and Flannery (2008) and Clark et al. (2009) report similar results. In line with the predictions by Mills (1996), our results indicate a statistically weak but positive relationship between inflation and speed of capital structure (Table 3.7). This confirms the hypothesis that inflationary situations lead to increased cost of capital for sub-optimal capital structure, and hence lead, to higher adjustment speed towards an optimal capital structure. This result is in sync with the findings reported in Wanzenried (2006) in a study of four European countries.

Our results show that the nexus between the overall size of the economy and its growth rate, on the one hand, and leverage, on the other, is a function of how one defines leverage. In particular, we observe a negative but weak relationship between GDP per capita growth rate and adjustment speed of short-term leverage and a positive relationship for long-term and total leverage (Table 3.7). This partially confirms Hackbarth et al.'s (2006) argument that lower restructuring thresholds during periods of high GDP per capita growth lead to faster capital structure adjustment speeds. In a study of firms drawn from four European countries, Wanzenried (2006) reports similar results. Also, we note that overall size of the economy impacts adjustment speed of short-term leverage negatively while it positively impacts the adjustment speed of long-term leverage (Table 3.7).

Dependable legal systems, which assure investors that they receive promised cash flows, enhance capital market transactions (e.g., Öztekin and Flannery 2008). Although

statistically weak, we find that adjustment speeds of both short-term and long-term leverage are faster in countries with stronger shareholder rights protection. However, an opposite relationship emerges when total leverage is considered (Table 3.7). This partially confirm the hypothesis that firms in countries with better protection to shareholder rights exhibit faster capital structure adjustment speed than is the case in countries with poor shareholder rights protection.

In contrast to Öztekin and Flannery (2008) and Clark et al. (2009), a negative relationship is revealed between the adjustment speeds of short-term and total-leverage and creditor rights protection (Table 3.7). On the other hand, although statistically weak, we observe that creditor rights protection positively influences the adjustment speed of long-term leverage. The statistically significant negative relationship does not support our hypothesis that a stronger protection of creditor rights leads to a faster capital structure adjustment speed. In addition, albeit statistically weak, we observe that better law enforcement tends to positively impact on the adjustment speed of capital structure independent of how leverage is defined (Table 3.7). This is in sync with the theory that better law enforcement positively affects adjustment speed of capital structure and also in agreement with results reported in Öztekin and Flannery (2008) and Clark et al. (2009).

We observe that stock market size has a statistically strong but definitionally sensitive influence on adjustment speed. To be exact, it has a negative influence on adjustment speed of short-term and total-leverage while it has a positive influence on the adjustment speed of long-term leverage. We observe, more or less, similar results for the stock market liquidity variable. These results vindicate Deesomsak et al. (2009) who argue that developed stock markets, by reducing information asymmetry, may trigger firms to switch to long-term leverage. As such, firms may rapidly adjust their long-term than short-term leverage in countries with bigger and developed stock markets.

In line with extant literature (e.g., Öztekin and Flannery 2008), our results show a statistically weak but positive relationship between relative size of banking sector and capital structure adjustment speed independent of how leverage is defined. Thus, our result supports the proposition that firms in countries with more developed banking sector adjust their capital structure more rapidly than those in countries with less developed banking sector.

3.5 Conclusions

In this chapter, we further extended the debate on basic capital structure decisions of firms in Africa along the lines of empirical endeavours elsewhere. We contended that capital structure of firms in Africa displays target behaviour and the pace at which they adjust their capital structure to a target is a function of not only firm characteristics but also of industrial, institutional and macroeconomic factors. We examined the data using system-GMM panel data estimator which is robust to firm heterogeneity and data endogeneity problems.

The chapter presented evidence that capital structure of firms in Africa not only converges to a target but also that it faces varying degrees of adjustment costs and/or benefits in doing so. This suggests not only that dynamic trade-off theory explains capital structure decisions of firms in our sample countries but also rules out the dominance of information asymmetry based theories within the context of firms in Africa.

Also, the chapter established that the extent of costs and/or benefits of adjustment that firms in Africa face is determined, *inter alia*, by firm-specific factors such as firm profitability, size, growth opportunities, and the gap between observed and target capital structure. Furthermore, except for firm profitability which positively influences adjustment speed, we observe that the nature of influence that firm-specific characteristics exert on adjustment costs and/or benefits is a function of how leverage is defined. The role that firm-specific characteristics play in the determination of adjustment speed suggests that financing

costs, financial flexibility, access to external finance, the potential cost of distress and the value of debt-related tax-shields are at play in aggravating or mitigating adjustment costs and/or benefits.

In terms of inter-industry differences in adjustment costs and/or benefits, we note that the relationships are sensitive to how one defines capital structure. On a short-term leverage basis, firms within the Durables and Chemicals & Construction industries move toward their target capital structures relatively rapidly than is the case in other industries. In contrast, on a long-term leverage basis, firms within the Health, Oil & Gas, and Regulated industries move towards their target capital structures relatively rapidly compared to those in other industries. A further investigation shows that firms in industries with higher default risk tend to adjust faster than those industries with lesser default risk implying that probability of bankruptcy has important place in determining adjustment costs and/or benefits of a firm in our sample countries.

In addition, consistent with the view that adjustment costs should be lower and /or adjustment benefits should be higher in common law origin countries; we observe that firms in countries with common law tradition tend to more rapidly adjust their capital structure than is the case in countries with civil law system. In terms of more-narrowly-defined institutional variables, we observe that shareholder rights protection and rule of law, in contrast to creditor rights protection, have positive influence on capital structure adjustment speed of firms. The implication of these findings is that investor protection and contract enforceability are important matters in the determination of adjustment costs and/or benefits of a firm in the sample countries.

The chapter also proffers evidence that a more developed banking sector and stock market negatively influence speed of adjustment of short-term and total leverage. Contrary to expectation, adjustment speeds of short-term and long-term leverages are slower in richer

countries than is the case in poorer countries. Furthermore, firms in countries which have higher marginal corporate tax rate and inflation tend to have faster adjustment speed. Put together, the evidences again suggest that access to external finance and tax issues are central to the determination of adjustment costs and/or benefits of a firm in our sample.

Although there has been an avalanche of theoretical and empirical endeavours to enhance our understanding about the dynamics of basic capital structure, similar researches on the maturity structure of debt are scarce; especially within the African setting. In Chapter 4, the thesis examines the role that firm, industry, institutional and macroeconomic factors play in the determination of a firm's debt maturity structure.

Table 3.1 Evolution of firm and country characteristics**Panel A:** Descriptive statistics of firm characteristics

Year	Distance - STL	Distance - LTL	Distance - TL	Firm Size	Earnings Volatility	Profitability	Growth Opportunities	Asset Tangibility	Dividend Payout	Tax shield
1999	0.069	0.139	0.096	5.221	0.244	0.274	0.024	0.543	0.293	0.031
2000	0.161	0.170	0.092	5.108	0.270	0.059	0.034	0.457	0.634	0.030
2001	0.142	0.171	0.097	5.150	0.274	0.124	0.058	0.390	0.553	0.038
2002	0.142	0.179	0.112	4.968	0.216	0.086	0.029	0.369	0.675	0.036
2003	0.157	0.187	0.091	4.961	0.235	0.094	0.056	0.362	0.687	0.036
2004	0.156	0.176	0.089	4.973	0.219	0.106	0.053	0.348	0.632	0.034
2005	0.159	0.174	0.090	5.067	0.234	0.118	0.035	0.337	0.584	0.033
2006	0.150	0.168	0.082	5.170	0.208	0.114	0.078	0.326	0.601	0.031
2007	0.148	0.165	0.087	5.321	0.225	0.130	0.086	0.322	0.614	0.031
2008	0.140	0.167	0.086	5.417	0.209	0.122	0.075	0.325	0.613	0.033
Overall	0.151	0.172	0.089	5.116	0.224	0.112	0.059	0.350	0.619	0.034

Notes: Distance-STL refers to the difference between the observed short-term leverage and the fitted values from a fixed effects (two way error component) regression of the short-term leverage on the eight capital structure determinants; Distance-LTL refers to the difference between the observed long-term leverage and the fitted values from a fixed effects (two way error component) regression of the long-term leverage on the eight capital structure determinants; Distance-TL refers to the difference between the observed total leverage and the fitted values from a fixed effects (two way error component) regression of the total leverage on the eight capital structure determinants. The exact definition of the other variables in the table is as indicated in Table 2.3 in Chapter 2.

Table 3. 1: (con'd ...)

Panel B: Descriptive statistics of institutional and macroeconomics characteristics													
Year	Total Leverage	Long- term Leverage	Short- term Leverage	Taxation	Inflation	Size of Economy	Growth of Economy	Size of Stock Market	Liquidity of Stock Market	Size of Banking Sector	Creditor Rights	Shareholder Rights	Rule of Law
1999	0.413	0.099	0.314	35.108	4.098	3.188	2.332	73.484	26.960	0.660	2.384	3.550	.
2000	0.448	0.100	0.348	34.985	4.213	3.199	2.621	58.206	28.824	0.657	2.384	3.550	-0.077
2001	0.488	0.121	0.367	34.985	4.821	3.206	1.677	46.577	18.948	0.691	2.384	3.550	.
2002	0.501	0.115	0.386	34.985	5.363	3.210	1.034	61.606	30.713	0.702	2.384	3.550	-0.102
2003	0.500	0.109	0.392	34.863	5.797	3.220	2.206	62.971	20.428	0.699	2.384	3.550	-0.125
2004	0.500	0.112	0.388	34.863	8.252	3.233	3.202	85.285	23.278	0.705	2.384	3.550	-0.036
2005	0.499	0.115	0.384	34.863	5.530	3.246	2.980	112.525	35.167	0.709	2.384	3.550	-0.030
2006	0.498	0.121	0.377	34.531	7.001	3.266	4.609	125.792	44.854	0.691	2.384	3.550	-0.099
2007	0.490	0.131	0.359	23.404	8.021	3.285	4.592	144.504	42.829	0.679	2.384	3.550	-0.119
2008	0.476	0.139	0.337	23.404	NA	NA	NA	NA	51.166	.	2.384	3.550	-0.100
Overall	0.493	0.118	0.375	32.599	5.899	3.228	2.806	85.661	32.317	0.688	2.384	3.550	-0.086

Notes: The exact definition of the variables is indicated in Table 2.3 in Chapter 2.

Table 3.2: Firm-specific factors and capital structure adjustment – Model 1

Dependent Variable	Short-term leverage	Long-term leverage	Total leverage
$LV_{i,t-1}$	0.461 *** (0.086)	0.410 *** (0.097)	0.606 *** (0.086)
$LV_{i,t-1} \times Size_{i,t}$	0.033 (0.022)	-0.116 * (0.062)	0.062 ** (0.025)
$LV_{i,t-1} \times Profit_{i,t}$	-0.810 ** (0.403)	-0.453 (0.944)	-0.767 * * (0.359)
$LV_{i,t-1} \times Grwth_{i,t}$	0.164 (0.185)	-0.257 (0.528)	0.048 (0.231)
$LV_{i,t-1} \times Dist_{i,t}$	-0.128 (0.361)	8.038 *** (1.231)	-0.814 ** (0.354)
Constant	0.150 ** (0.062)	0.042 (0.031)	0.095 (0.062)
Wald Test	49.21 ***	317.18 ***	386.16 ***
Z_2	1.148	-0.974	0.753
Sargan Test	96.738 (107)	127.715 (113)	100.641 (107)
N	1067	1130	1070

Notes: The table reports the results of estimating Equation (6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. The table shows the coefficients on the lagged leverage ratio and on the interaction term of the determinant of adjustment speed with the lagged leverage ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target leverage ratio are jointly equal to zero. The test statistic Z_2 tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator. In parenthesis are the chi-squares. $Size_{i,t}$ refers to size of firm i at time t . $Profit_{i,t}$ refers to profitability of firm i at time t . $Grwth_{i,t}$ refers to growth opportunities of firm i at time t . $Dist_{i,t}$ refers to the value of the distance variable (as defined in Table 3.1) of firm i at time t . The exact definition of the variables is as presented in Table 2.3 in Chapter 2.

Table 3.3 - Capital structure and its adjustment speed by industry

Panel A: Inter-industry heterogeneity in adjustment speeds of basic capital structure

Dependent Variable	Short-term leverage	Long-term leverage	Total leverage
Non-durable Industry	0.616 *** (0.165) 1006	0.549 ** (0.259) 1055	0.725 *** (0.141) 1011
Durable Industry	0.424 * (0.284) 167	0.929 ** (0.408) 170	0.686 *** (0.192) 167
Manufacturing Industry	0.563 *** (0.134) 921	0.564 *** (0.162) 958	0.662 *** (0.102) 922
Oil and Gas Industry	0.523 (0.386) 385	0.255 (1.414) 383	0.208 (1.302) 386
Chemicals & Construction Industry	0.426 (0.852) 523	0.370 *** (0.131) 536	0.550 *** (0.174) 523
Business Equipment Industry	0.902 ** (0.387) 346	0.537 (0.894) 350	0.865 *** (0.223) 346
Regulated Industry	0.728 (2.279) 304	0.333 ** (0.152) 310	0.839 (1.494) 305
Wholesale & Retail Industry	0.764 (0.882) 697	0.592 *** (0.138) 748	0.841 (0.819) 705
Health Industry	0.739 (0.503) 283	0.084 (3.134) 294	0.467 (0.791) 283
Service Industry	0.453 *** (0.199) 814	0.643 *** (0.208) 862	0.649 *** (0.156) 814

Notes: The table reports the parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each industry in the sample. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations. The exact definition of the industries is as reported in Table 2.2 in Chapter 3.

Panel B: Summary Statistics of Leverage by Industry

	Short-term leverage			Long-term leverage			Total leverage		
	Mean	SD*	Obs#	Mean	SD*	Obs#	Mean	SD*	Obs#
Non-durables	0.345	0.209	1006	0.109	0.159	1055	0.467	0.288	1011
Durables	0.342	0.178	167	0.088	0.115	170	0.432	0.212	167
Manufacturing	0.357	0.194	921	0.124	0.176	958	0.482	0.245	922
Oil & Gas	0.265	0.233	385	0.197	0.206	383	0.477	0.321	386
Chem. & Construction	0.445	0.224	523	0.108	0.164	536	0.555	0.230	523
Business Equipment	0.429	0.243	346	0.078	0.105	350	0.526	0.316	346
Regulated	0.367	0.200	304	0.182	0.194	310	0.546	0.226	305
Wholesale & Retail	0.428	0.229	697	0.095	0.119	748	0.545	0.309	705
Health	0.352	0.189	283	0.074	0.138	294	0.435	0.232	283
Service & Others	0.318	0.226	814	0.132	0.160	862	0.462	0.293	814

Notes: SD = Standard deviation; Obs = Number of observations. The exact definition of the industries is as reported in Table 2.2 in Chapter 2.

Table 3.4: Cross-country heterogeneity in adjustment speed of basic capital structure

Dependent Variable	Short-term leverage	Long-term leverage	Total leverage
Egypt	0.531 *** (0.096) 2685	0.442 *** (0.098) 2702	0.658 *** (0.133) 2697
South Africa	0.816 (0.853) 1664	0.178 (0.645) 1663	0.773 *** (0.136) 1665
Kenya	0.349 *** (0.135) 150	0.178 *** (0.056) 163	0.022 (0.092) 151
Morocco	0.750 (0.833) 288	0.949 *** (0.141) 289	0.647 *** (0.318) 288
Tunisia	0.539 *** (0.179) 176	0.131 (0.181) 177	0.360 (0.452) 176

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each country in the sample. The results of four countries including Botswana, Ghana, Mauritius, and Nigeria were not included owing to sample size issues. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 3.5: Heterogeneity in Adjustment Speeds across Legal Origin

Dependent Variable	Short-term leverage	Long-term leverage	Total leverage
Common Law	0.430 *** (0.151) 3322	0.282 (1.309) 3341	0.619 ** (0.291) 3334
French Law	0.527 *** (0.086) 2122	0.469 *** (0.100) 2325	0.641 *** (0.080) 2128

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each legal family. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 3.6: Heterogeneity in Adjustment Speeds across Income Groups

Dependent Variable	Short-term leverage	Long-term leverage	Total leverage
Upper middle income countries	0.802 (0.618) 1911	0.099 (0.221) 1910	0.775 *** (1.379) 1912
Lower middle income countries	0.539 *** (0.136) 3149	0.471 *** (0.105) 3168	0.648 *** (0.081) 3161
Low income countries	0.190 (0.432) 388	0.310 *** (0.080) 588	0.533 (0.597) 389

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each income group family. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 3.7 Determinants of adjustment speed of capital structure – Model 2

Panel A:	Dependent variable – Short term leverage													
	Model 2 (a)		Model 2 (b)		Model 2 (c)		Model 2 (d)		Model 2 (e)		Model 2 (f)		Model 2 (g)	
LV _{i,t-1}	0.456 ***		0.452 ***		0.521 ***		0.462 ***		0.469 ***		0.498 ***		0.480 ***	
	(0.093)		(0.083)		(0.100)		(0.097)		(0.087)		(0.112)		(0.105)	
LV _{i,t-1} x Profit _{i,t}	-0.609 *		-0.626 *		-0.906 **		-0.458		-0.537		-0.626		-0.455	
	(0.343)		(0.337)		(404)		(0.384)		(0.380)		(0.411)		(0.349)	
LV _{i,t-1} x Grwth _{i,t}	0.251		0.123		0.143		0.129		0.226		0.198		0.231	
	(0.186)		(0.178)		(0.219)		(0.204)		(0.209)		(0.213)		(0.213)	
LV _{i,t-1} x Dist _{i,t}	0.440		0.061		0.176		0.213		0.392		0.150		0.432	
	(0.388)		(0.286)		(0.348)		(0.462)		(0.421)		(0.449)		(0.353)	
LV _{i,t-1} x GDPG _{i,t}	0.003													
	(0.010)													
LV _{i,t-1} x SR _{i,t}													-0.077	
													(0.052)	
LV _{i,t-1} x RUL _{i,t}	-0.055								-0.075				-0.105	
	(0.084)								(0.094)				(0.090)	
LV _{i,t-1} x TAX _{i,t}			-0.001											
			(0.001)											
LV _{i,t-1} x STKLIQ _{i,t}											0.050			
											(0.135)			
LV _{i,t-1} x INFL _{i,t}					-0.001						0.001			
					(0.004)						(0.004)			
LV _{i,t-1} x STKSIZ _{i,t}					0.097 **									
					(0.048)									
LV _{i,t-1} x BNKSIZ _{i,t}							-0.169							
							(0.181)							
LV _{i,t-1} x CR _{i,t}							0.080 *							
							(0.048)							
LV _{i,t-1} x LOGGDP _{i,t}									0.015					
									(0.070)					
Constant	0.170 ***		0.204 ***		0.168 ***		0.161 **		0.154*		0.174 **		0.229 ***	
	(0.047)		(0.046)		(0.051)		(0.063)		(0.086)		(0.072)		(0.079)	
Wald Test	42.99 ***		43.68 ***		58.28 ***		41.35 ***		37.99***		31.21 ***		54.09 ***	
Z ₂	0.155		1.471		0.295		0.483		0.264		0.262		1.184	
Sargan Test	82.186		103.280		90.687		80.335		85.404		89.233		110.194	
N	5444		5441		5435		5440		5429		5437		5428	

Notes: $GDPG_{i,t}$ refers to the growth rate of real GDP of the country in which firm i operates at time t . $SR_{i,t}$ refers to the shareholder rights protection index of the country in which firm i operates at time t . $RUL_{i,t}$ refers to the rule of law index of the country in which firm i operates at time t . $TAX_{i,t}$ refers to the highest corporate marginal tax rate of the country in which firm i operates at time t . $STKLIQ_{i,t}$ refers to stock market liquidity of the country in which firm i operates at time t . $INF_{i,t}$ refers to inflation rate of the country in which firm i operates at time t . $STKSIZ_{i,t}$ refers to stock market capitalization of the country in which firm i operates at time t . $BNKSIZ_{i,t}$ refers to the relative size of banking sector of the country in which firm i operates at time t . $CR_{i,t}$ refers to creditor rights index the country in which firm i operates at time t . $LOGGDP_{i,t}$ refers to natural logarithm of the GDP of the country in which firm i operates at time t . The exact definition of the other variables is as presented in Tables 3.1 and 3.4. The table reports the results of estimating Equation (6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. The table shows the coefficients on the lagged leverage ratio and on the interaction term of the determinant of adjustment speed with the lagged leverage ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target leverage ratio are jointly equal to zero. The test statistic Z2 tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator.

Table 3.7 (con'd...)

Panel B: Dependent Variable – Long term leverage

	Model 2 (a)	Model 2 (b)	Model 2 (c)	Model 2 (d)	Model 2 (e)	Model 2 (f)	Model 2 (g)
$LV_{i,t-1}$	0.463 *** (0.135)	0.396 *** (0.118)	0.476 *** (0.152)	0.460 * (0.244)	0.428 *** (0.124)	0.492 *** (0.095)	0.413 *** (0.095)
$LV_{i,t-1} \times Profit_{i,t}$	-1.188 (1.197)	-0.551 (0.881)	-1.500 * (0.859)	-0.989 (0.244)	-1.220 (1.012)	-1.360 * (0.740)	-0.692 (0.834)
$LV_{i,t-1} \times Grwth_{i,t}$	-0.527 (0.596)	-0.615 (0.391)	-0.471 (0.494)	-0.421 (0.379)	-0.363 (0.407)	-0.331 (0.378)	-0.555 (0.453)
$LV_{i,t-1} \times Dist_{i,t}$	6.460 *** (1.461)	8.109 *** (1.424)	7.713 *** (2.173)	7.153 *** (2.318)	7.334 *** (1.597)	6.750 *** (1.404)	7.690 *** (1.347)
$LV_{i,t-1} \times SR_{i,t}$							-0.095 (0.101)
$LV_{i,t-1} \times RUL_{i,t}$	-0.140 (0.165)				-0.074 (0.145)		-0.104 (0.155)
$LV_{i,t-1} \times TAX_{i,t}$		-0.011 *** (0.004)					
$LV_{i,t-1} \times STKLIQ_{i,t}$						-0.071 (0.247)	
$LV_{i,t-1} \times INFL_{i,t}$			-0.013 (0.013)			-0.003 (0.017)	
$LV_{i,t-1} \times STKSIZ_{i,t}$			0.276 ** (0.133)				
$LV_{i,t-1} \times BNKSIZ_{i,t}$				-0.575 (0.595)			
$LV_{i,t-1} \times CR_{i,t}$				-0.050 (0.160)			
$LV_{i,t-1} \times LOGGDP_{i,t}$					-0.211 * (0.131)		
Constant	0.004 (0.026)	0.022 (0.016)	-0.010 (0.011)	0.041 * (0.024)	0.059 * (0.034)	0.006 (0.020)	0.023 (0.022)
Wald Test	294.04 ***	299.46 ***	331.24 ***	237.02 ***	241.09 ***	286.83 ***	371.00 ***
Z_2	-0.812	-1.171	-0.787	-1.034	-0.833	-0.950	-0.986
Sargan Test	97.645	118.615	105.800	96.548	102.111	102.877	132.44
N	5666	5662	5645	5658	5661	5659	5652

Notes: The exact definition of the other variables is as presented in Tables 3.1, 3.4 and 3.9 (Panel A). The table reports the results of estimating Equation (6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. $Dist_{i,t}$ is constructed as the fitted values from a fixed effects (two way error component) regression of the respective measures of leverage on the eight capital structure determinants. The exact definitions of all the other variables are presented in Appendix 1. The table shows the coefficients on the lagged leverage ratio and on the interaction term of the determinant of adjustment speed with the lagged leverage ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target leverage ratio are jointly equal to zero. The test statistic Z_2 tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator.

Table 3.7: (Con'd ...)

Panel C: Dependent Variable – Total leverage

	Model 2 (a)	Model 2 (b)	Model 2 (c)	Model 2 (d)	Model 2 (e)	Model 2 (f)	Model 2 (g)
$LV_{i,t-1}$	0.612 *** (0.096)	0.634 *** (0.101)	0.699 *** (0.077)	0.568 *** (0.109)	0.586 *** (0.090)	0.664 *** (0.083)	0.620 *** (0.076)
$LV_{i,t-1} \times Profit_{i,t}$	-0.594 * (0.309)	-0.553 (0.366)	-0.799 ** (0.393)	-0.610 ** (0.300)	-0.766 * (0.446)	-0.630 * (0.355)	-0.740 * (0.434)
$LV_{i,t-1} \times Grwth_{i,t}$	0.132 (0.179)	0.078 (0.188)	0.064 (0.201)	0.076 (0.132)	0.090 (0.179)	0.083 (0.165)	0.086 (0.162)
$LV_{i,t-1} \times Dist_{i,t}$	-0.180 (0.246)	-0.449 * (0.251)	-0.256 (0.236)	-0.320 (0.257)	-0.516 * (0.285)	-0.280 (0.206)	-0.435 (0.307)
$LV_{i,t-1} \times GDPG_{i,t}$	-0.003 (0.012)						
$LV_{i,t-1} \times SR_{i,t}$							0.008 (0.031)
$LV_{i,t-1} \times RUL_{i,t}$	-0.089 (0.089)				-0.070 (0.094)		-0.040 (0.083)
$LV_{i,t-1} \times TAX_{i,t}$		-0.001 (0.001)					
$LV_{i,t-1} \times STKLIQ_{i,t}$						-0.016 (0.100)	
$LV_{i,t-1} \times INFL_{i,t}$			-0.001 (0.004)			-0.001 (0.003)	
$LV_{i,t-1} \times STKSIZ_{i,t}$			0.073 ** (0.030)				
$LV_{i,t-1} \times BNKSIZ_{i,t}$				-0.216 (0.151)			
$LV_{i,t-1} \times CR_{i,t}$				0.124 ** (0.055)			
$LV_{i,t-1} \times LOGGDP_{i,t}$					0.050 (0.051)		
Constant	0.201 *** (0.058)	0.221 *** (0.061)	0.167 *** (0.050)	0.184 *** (0.067)	0.168 ** (0.083)	0.185 *** (0.065)	0.204 *** (0.061)
Wald Test	105.49 ***	104.08 ***	176.15 ***	196.97 ***	83.37 ***	125.91 ***	118.35 ***
Z_2	-0.288	1.432	-0.347	-0.102	-0.159	-0.234	1.110
Sargan Test	83.319	109.630	85.574	81.504	80.504	82.596	116.237
N	5462	5448	5432	5455	5461	5460	5441

Notes: The exact definition of the other variables is as presented in Tables 3.1, 3.4 and 3.9 (Panel A). The table reports the results of estimating Eq.(6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. $Dist_{i,t}$ is constructed as the fitted values from a fixed effects (two way error component) regression of the respective measures of leverage on the eight capital structure determinants. The exact definitions of all the other variables are presented in Appendix1. The table shows the coefficients on the lagged leverage ratio and on the interaction term of the determinant of adjustment speed with the lagged leverage ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target leverage ratio are jointly equal to zero. The test statistic Z_2 tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator.

CHAPTER 4

DETERMINANTS OF DEBT MATURITY STRUCTURE

4.1 Introduction

Corporate finance theory has furthered our understanding of a range of financial decisions, *inter alia*, capital structure, debt maturity structure, and dividend policy. In Chapter 3, the thesis extended the debate on basic capital structure by empirically examining the role that institutions, macroeconomic conditions, firm-specific factors and industry characteristics play in capital structure rebalancing decisions of firms in the African setting. Although there has been a proliferation of studies on the subject of basic capital structure choice much less is known about debt maturity structure of firms (e.g., Schiantarelli and Sembenelli 1999; Antoniou, Guney and Paudyal 2006). However, debt maturity decisions are as important since they may be used to: (i) avoid liquidity risk by aligning a firm's asset structure with its debt maturity structure; (ii) address agency problems; (iii) signal quality of earnings of a firm; or (iv) enhance flexibility in financing, reduce cost of financing, and refunding risk (Cai, Fairchild and Guney 2008)³⁹. Thus, in this chapter, the thesis examines debt maturity structure of firms in the African setting.

The earliest work on debt maturity structure was that of Morris' (1975) which focused on the determinants of debt maturity structure of U.S firms. Most subsequent empirical studies on debt maturity studies focused on North America (e.g., Mitchell 1993; Barclay and Smith Jr 1995; Stohs and Mauer 1996; Scherr and Hulburt 2001), Western Europe (e.g., Ozkan 2000; 2002; Antoniou et al. 2006) and Japan (e.g., Cai et al. 1999). Lately, however, the literature has started witnessing a few research endeavours within the context of developing/emerging economies. The researches by Arslan and Karan (2006) on Turkish

³⁹ An exact definition of the phrase "debt maturity structure" as employed in this chapter and the debate surrounding an appropriate measure of debt maturity structure are documented in the section entitled "measuring debt maturity structure."

firms; by Cai et al. (2008) on Chinese firms; by Gwatidzo (2009:149-222) on the choice of sources of debt on selected African countries, and Terra (2011) on Latin America are examples of the few researches that were carried out within the milieu of developing/emerging economies.

The existing empirical work on debt maturity structure, nevertheless, has some limitations. First, it largely ignored how African firms make maturity decision although the institutional and macroeconomic setup of African economies is profoundly different from those in the developed world (e.g., Gwatidzo 2009:30). Second, except for a few studies (e.g., Antoniou et al. 2006; Fan et al. 2008; Terra 2011), most past researches deal with debt maturity structure within a single-country context. Although single-country studies enhance our understanding about a firm's debt maturity decisions, they don't help us explain cross-country variations in debt maturity structure. Thirdly, although we anticipate inter-industry variations in debt maturity structure, there is no published work which examines inter-industry variation in debt maturity structure. This chapter contributes to the literature since it is a first attempt to directly test the influence of institutional, macroeconomic, industry and firm-specific factors on debt maturity structure decisions of firms within the context of African countries.⁴⁰ To that extent, it offers an 'out of sample' test for existing theories, primarily originating from US experience, by providing a comparative picture of nine major African economies.

We drew a sample of 986 non-financial firms operating in nine African countries and analysed 10-year (1999 to 2008) data pertaining to these firms. Taking a cue from Fan et al. (2008) and Song and Philippatos (2004) who use a sequential approach to modelling capital and debt maturity structure, we first examine the data using a baseline model (Model 1) which specifies debt maturity structure as a function of firm characteristics. Second, we

⁴⁰ Although Gwatidzo (2009) investigates determinants of debt choice in sub-Saharan Africa, his focus was to identify the factors influencing a firm's choice of sources of debt finance, not debt maturity structure.

examine the data if the results in Model 1 persist after controlling for inter-industry differences (Model 2). Third, we consider cross-country variations in debt maturity structure by further including country dummies (Model 3). Fourth, we introduce some broadly-defined measures of cross country differences (i.e., legal system and level of development) that are known to impact on debt maturity structure (Model 4). Finally, we inject more specific and direct measures of institutional and macroeconomic conditions to see if such variables effect on debt maturity structure decisions of African firms (Model 5).

In terms of firm-specific factors, we obtain evidence that earnings volatility, asset maturity, non-debt-related tax-shield and leverage variables have positive influence whilst profitability and dividend payout ratios have inverse influence on debt maturity structure. We also document clear evidence that there is inter-industry variation in debt maturity structures of our sample firms. In terms of cross-country variations, we find evidence that: (i) there is cross-country variation in debt maturity structure; (ii) a country's income group, in addition to its direct impact, indirectly influences debt maturity structure of firms by enhancing or mitigating the impact of firm-specific factors on debt maturity structure; (iii) while shareholder and creditor rights protection, stock market size and size of overall economy positively influence debt maturity, economic growth, taxation and relative size of banking sector have a negative influence.

The remainder of the chapter proceeds as follows: section 2 presents a brief review of the literature on debt maturity structure. Section 3 develops the empirical setup for the analysis. Section 4 presents the results and discussions and section 5 concludes.

4.2 Literature Review

4.2.1 Debt maturity structure theories

The foundation for the theoretical literature on debt maturity, as in basic capital structure, was implied in the breakthrough work of MM (1958) although a more formalized explanation was only provided in Stiglitz (1974). Stiglitz extends the argument of MM to a multiperiod model to show that a firm's value, under certain conditions, is independent of its choice of debt maturity structure. Subsequent research efforts by relaxing Stiglitz's conditions conclude that firm value depends on its debt maturity structure. This subsequent body of research forwards a number of explanations for debt maturity structure of a firm. The main criticism that can be made about these explanations is that there has not been a universal theory that explains debt maturity structure of a firm. Rather, there are only a set of partial explanations that have not been unified into a single theory (e.g., Terra 2011).

We may summarize the main theories of debt maturity as follows. The first one is based on *tax hypothesis* which examines whether the amount of tax benefits differ between short-term and long-term debt. The explanations suggested by Brick and Ravid (1985; 1991) and Ravid (1996) are perhaps the best known works along the lines of this hypothesis. The second is based on *agency hypothesis* which posits that firms choose debt maturity structure to reduce agency costs arising from asset substitution and underinvestment (e.g., Jensen and Meckling 1976; Myers 1977; Barnea et al. 1980; Myers and Majluf 1984; Jensen 1986; Fama 1990; Harris and Raviv 1990). The third strand deals with *signalling hypothesis* which conjectures that a firm uses its debt maturity decision to convey information regarding its quality (e.g., Flannery 1986; Kale and Noe 1990; Mitchell 1991). The fourth theory is based on *liquidity risk hypothesis* which argues that the optimal debt maturity structure is a result of a trade-off between the benefits (e.g., reduced interest costs and enhanced reputation) and the

costs (e.g., liquidity risk) of issuing short-term debt (e.g., Diamond 1991). Finally, *maturity-matching* hypothesis suggests that firms match their debt maturity to their asset maturity (e.g., Hart and Moore 1994; Graham and Harvey 2001).

Based on these theories, the literature identifies a number of firm, industry and country level factors that determine debt maturity structure of a firm. However, neither theoretical predictions nor empirical results are uniform. Table 4.1 presents a summary of the theoretical predictions and empirical results.

(Insert table 4.1 about here)

4.2.2 Measuring debt maturity structure

As in the competing theories, there has not been one universally accepted measure of debt maturity structure. Empirical literature focused on either the term-to-maturity of debt issues or measures of the proportions of short- and long-term debt of a firm to measure debt maturity structure (e.g., Stohs and Mauer 1996). While the first approach enables measuring the actual number of years to maturity of a firm's debt, the latter approach provides a measure of monetary value of those debts maturing within the short-term relative to those maturing over the long-term. We adopt the latter approach mainly due to the difficulty of obtaining data on term-to-maturity of debt for our sample firms. Major studies such as Barclay and Smith Jr. (1995), Antoniou et al. (2006) and Deesomsak, Paudyal and Pescetto (2009) used a similar approach.

However, again, there is no universal definition of long- or short-term debt. Some studies use the one-year mark following accounting conventions (e.g., Scherr and Hulburt 2001; Antoniou et al. 2006) while others use a three-year mark (e.g., Barclay and Smith Jr 1995), or a five-year mark (e.g., Schiantarelli and Sembenelli 1997) to delineate between short- and long-term debt. We use the one-year mark to delineate between the two categories of debt,

again, because of data availability. Thus, we defined debt maturity structure as the ratio of non-current liabilities to total liabilities.

4.2.3 Firm characteristics and debt maturity structure

The debt maturity theory considers firm characteristics as proxies for tax advantages, costs of agency, risk of liquidation and degree of information asymmetry and analyses their role in the determination of a firm's debt maturity structure. Consistent with the literature, we include a set of firm level variables known to impact on debt maturity structure including firm size, profitability, growth opportunities, asset maturity, earnings volatility, non-debt-related tax-shield, dividend payout and leverage.

The literature commonly considers firm size as an inverse proxy for agency costs, degree of information asymmetry, and contracting and transaction costs. According to agency hypothesis, smaller firms are more likely to experience conflicts between shareholders and debtholders, leading to problems such as risk shifting, asset substitution and claim dilution. Further, the signalling role of debt is more important in smaller firms, as smaller firms might communicate less information to outsiders leading to more informational asymmetries because of economies of scale in information production and distribution (e.g., Deesomsak et al. 2009). Hence, both tax and signalling hypotheses suggests that larger firms tend to choose longer maturity than smaller ones.

Past profitability of a firm has been under scrutiny in debt maturity structure research. The tax hypothesis suggests that a firm's profitability should be directly related with debt maturity as profitable firms have higher taxable income, and thus receive greater tax benefits from long-term debt. This is because long-term debt can create a tax timing option to repurchase and re-issue debt (e.g., Kim, Mauer and Stohs 1995; Scherr and Hulburt 2001; Deesomsak et al. 2009). On the other hand, Flannery's (1986) signalling theory contends that

short-term debt issuance is perceived by the market as good news that cannot be imitated by firms of bad quality. Hence, it is only firms with higher profit that could choose to issue short-term debts because they believe in their ability to refinance in opportune times. Thus, according to this theory, debt maturity is a decreasing function of a firm's profitability.

Theoretical prediction regarding the influence of growth opportunities on debt maturity is indeterminate as growth opportunities of a firm could be taken as a proxy for a host of attributes including agency costs, information asymmetry and liquidity risk. Agency hypothesis suggests that the agency cost of debt is likely to be higher for high growth firms which have more flexibility in their choice of future investments (e.g., Titman and Wessels 1988). Informational asymmetries also tend to increase with growth opportunities. Hence, according to both hypotheses, abundance of growth opportunities shortens debt maturity (e.g., Myers 1977; Deesomsak et al. 2009). Liquidity hypothesis, on the other hand, predicts that firms with long-term investment opportunities – requiring ongoing managerial discretion – prefer hedge against liquidity risk by issuing long-term debts (e.g., Diamond 1991). Thus, based on liquidity risk reasoning, abundance of growth opportunities lengthens debt maturity.

Stohs and Mauer (1996) and Morris (1975) argue that a firm can face the risk of not having sufficient cash in situations where the maturity of debt does not match that of assets. Similarly, Myers (1977) argues that maturity matching could partially serve as a tool for mitigation of underinvestment problems. Based on these arguments, we expect a direct relationship between asset maturity and debt maturity structure.

The literature views earnings volatility as a proxy for the probability of financial distress, which leads to high bankruptcy risk. Studies as early as Kane, Marcus and McDonald (1985), using an option valuation model, show that the volatility of asset returns is inversely related to debt maturity. Flannery (1986) derives a separating equilibrium with positive transaction costs in which riskier borrowers are not able to cover cost of rolling short-term debt and

prefer long-term debt, while low-risk borrowers stick to short-term debt. Kale and Nevo (1990) suggest that similar separating equilibrium is possible even in a framework without transaction costs. Sarkar (1999) also documents a negative relationship between debt maturity and earnings volatility.

In an influential piece of work, DeAngelo and Masulis (1980) argue that non-debt-related tax-shields are substitutes for debt-related tax-shields. The size of tax-shield benefit that a firm would receive by issuing long-term debt depends on the size of its non-debt-related tax-deductible items such as depreciation, amortization, tax credits, etc.; the higher the size of these items, the lesser the taxable income, and hence higher tax benefit that accrues to a firm from its use of long-term debt. Thus, we conjecture that debt maturity structure is a decreasing function of non-debt-related tax-shield.

Reasoning based on agency and signalling hypotheses suggests that dividend payout ratio is inversely related to debt maturity structure as such firms tend to have lesser agency and information asymmetry related problems (e.g., Bhattacharya 1979; Miller and Rock 1985; Terra 2011). This theoretical argument is supported empirically by Ferreira, Laureano and Custodio (2011) who find that U.S. firms that do not pay dividends are more likely to be financially constrained and less likely to be able to issue long-term debt.

The liquidity hypothesis predicts that a firm lengthens its debt maturity as leverage increases in order to offset the higher probability of liquidity crises, and thus delay exposure to bankruptcy risk (e.g., Stohs and Mauer 1996). On the other hand, Myers (1977) suggests that the agency cost of under-investment can be mitigated by reducing leverage, or by shortening debt maturity. If firms reduce debt to mitigate the under-investment problem, there is less need to shorten their debt maturity.

4.2.4 Industry characteristics and debt maturity structure

The extant literature presents ample evidence on inter-industry variation in debt maturity structure. For instance, Barclay and Smith (1995) recognize the role of industry effects in debt maturity decisions by suggesting that firms in regulated industries choose less short-term debt because the agency costs of managerial discretion are lower in such industries. In a study of debt maturity structures of Chinese companies, Cai et al. (2008) note generally similar results with regard to the determinants of debt maturity structures across different industries. Likewise, Guedes and Opler (1996) examined the determinants of the maturity of corporate debt issues of 7 369 bonds and notes, and found that firms in utilities industry, on average, issue relatively long-term debt. The literature identifies that the driving forces behind these variation are managerial incentives, asset structure, operating flexibility, economies of scale in borrowing and operations, level of financial market access and level of asymmetry between managers and lenders (e.g., Guedes and Opler 1996; Scherr and Hulburt 2001). In the present chapter, as in the previous chapters, we employ ten industry classifications following the work of Song and Philippatos (2004). The financial industry is excluded because its debt maturity structure is strongly affected by a different set of regulatory requirements.

4.2.5 Institutions and debt maturity structure

Recent literature points out that debt maturity decisions of a firm can hardly be understood in isolation from the legal and financial institutions that epitomize the country in which the firm operates. This is because different institutional environments influence the relationship between managers, shareholders and creditors (e.g., Antoniou et al. 2006; Fan et al. 2008; Deesomsak et al. 2009). In this section, we explore how these institutions effect on debt maturity decisions of a firm.

4.2.5.1 Legal institutions

Recent literature accentuates the critical role of legal institutions in understanding patterns of corporate finance in different countries (e.g., La Porta et al. 1998). Debt maturity structure theory suggests that a major factor in a firm's choice of debt maturity structure is the existence of agency costs. And, the legal environment in which contracting takes place affects the extent of agency problem that exists between corporate insiders and outsiders, and thus, influences outsiders' confidence in the markets and consequently their development (e.g., Djankov et al. 2008; Fan et al. 2008). Prior empirical works indicate that there are varying degrees of disparities between the laws in the books and laws in action. This phenomenon is particularly conspicuous when one considers the African continent as all African countries had adopted (or "transplanted") laws from Western origin (e.g., Berkowitz et al. 2003). We consider the legal tradition on which a country's legal system is based to investigate cross-country disparities in debt maturity structures. We further consider variables that are known to more-narrowly-define the legal institutions in a country: shareholder rights protection; creditor rights protection; and quality of law enforcement.

Firms in countries with stronger shareholder rights protection tend to use more long-term debt than short-term debt as the need to use short-term debt to mitigate agency problems is reduced. On the other hand, according to Diamond (1991), stronger creditor rights protection incentivizes lenders who engage in monitoring activities to make short-term loans. Hence, firms in such countries will use more short-term debt than long-term debt. Furthermore, since short-term debt makes it more difficult for borrowers to expropriate creditors, firms in countries with poor law enforcement are likely to issue more short-term debt than long-term debt (e.g., Hart and Moore 1995; Diamond 2004).

4.2.5.2 Financial institutions

The debt maturity research also considers financial institutions as factors that determine debt maturity structure of firms. Based on extant literature, we identify three proxies that define the development of financial institutions in a given country: stock market size, stock market liquidity and relative size of banking sector⁴¹.

In countries where the weight of banking sector is heavier⁴², we observe more screening, monitoring and controlling of firms by banks as bankers have economies of scale in obtaining information (e.g., Diamond 1991). Such systems reduce creditor's costs related with information asymmetry, agency and bankruptcy (e.g., Demirgüç-Kunt and Maksimovic 1999; Levine 2002; Antoniou et al. 2008). Thus, the relative size of banking sector of a country is expected to be inversely related with debt maturity, because short-term debt enables banks to use their comparative advantage in monitoring lenders (e.g, Fan et al. 2008).

The conjectures on the influence of stock market development on debt maturity are difficult to discern. On the one hand, Grossman (1976) shows that market prices partially transmit information and hence reduce information asymmetry problems making lending to quoted firms less risky. Thus, an active stock market may increase a firm's ability to obtain long-term debt. On the other hand, both Deesomsak et al. (2009) and Demirgüç-Kunt and Maksimovic (1999) contend that there is an incentive for firms in countries with developed stock market to switch from long-term debt to equity, as the additional liquidity of the stock market encourages risk taking behaviour from well-informed investors. This could lead to stock market development to be negatively related with debt maturity. Which of these scenarios prevail in the context of African firms is an empirical matter.

⁴¹ These variables are the most commonly used variables in prior empirical efforts. Hence, we decided to use similar variables to enhance comparability. Otherwise, there are a host of variables that other literature uses to measure financial development. For an extensive discussion on measures of financial development, see Beck, T., et al. (2000), Demetriads, P. and Luintel, K. (1996) and Demirgüç-Kunt, A and R. Levine (1996).

⁴² Such countries are referred to as "bank-centred systems" in the literature.

4.2.6 Macroeconomic conditions and debt maturity structure

The notion that macro-economic conditions of a country influence debt maturity structure of a firm is not new. We consider three variables that define macro-economic conditions of a country: economic development, inflation, and taxation.

4.2.6.1 Economic development

Firms can be expected to use more short-term debts in lower-income countries as it is difficult in such countries both to sell shares of stock and to enforce contracts (e.g., Caprio Jr and Demirgüç-Kunt 1998). Furthermore, Demirgüç-Kunt and Maksimovic (1999) attribute the increased reliance on long-term debt of firms in more developed countries to maturity matching exercises as firms in developed countries tend to own more fixed assets. Similarly, in a more recent study, Fan et al. (2008) and Deesomsak et al. (2009) suggest that firms in less developed countries tend to use far less long-term debt than their counterparts in developed countries. We examine the influence of development on debt maturity by trifurcating our sample countries into three categories: upper-middle-income, lower-middle-income (LMI) and low-income (LI) group countries⁴³.

We further examine the role of economic development in the determination of a firm's debt maturity by introducing more specific variables: size of overall economy and its growth rate. The maturity matching hypothesis predicts that GDP per capita should be positively related with debt maturity structure. On the other hand, the fact that agency problem would tend to be exacerbated during times of recession or down turns increase the likelihood that firms would use more short-term debt at times of recession or downturn (e.g., De Haas and Peeters 2006).

⁴³ Classification of countries as “developed” and “developing/emerging” is a contentious issue and surrounded by fierce debate. Different institutions (e.g., the World Bank, IMF, The Economist, CIA, etc) use different criteria for classifying countries. We used World Bank's classification of countries into income groups.

4.2.6.2 Taxation

According to Kane et al. (1985), debt maturity is negatively associated with tax advantage of debt. Notwithstanding the attention that taxation and tax institution have received in debt maturity structure research, there has not been one easy way of measuring them⁴⁴. We employ highest marginal corporate tax rate as a proxy to measure differences in taxation systems across countries.

4.2.6.3 Inflation

Inflation is usually considered as a proxy for government's ability to manage the economy and it provides information about the stability of a currency in long-term contracting (e.g., Demirgüç-Kunt and Maksimovic 1999; Wanzenried 2006). Debt contracts are generally based on nominal terms and thus high inflation which generally increases the interest rate risk faced by firms may tilt lenders away from long-term debt. Hence, inflation should be inversely related with debt maturity (e.g., Demirgüç-Kunt and Maksimovic 1999; Fan et al. 2008; Deesomsak et al. 2009).

The noticeable commonality between most of the determinants⁴⁵ of basic capital and debt maturity structures and that capital structure as measured by leverage ratio is one of the determinants of debt maturity structure reinforces the view that the two financing decisions are rather intertwined and, perhaps, jointly determined. That is, in addition to the direct influence that determinants of debt maturity structure have on the latter, they also influence the latter through their influence on capital structure (Barclay, Marx and Smith 2001).

⁴⁴ See the discussion on Chapter 2 for an elaborate discussion on alternative proxies of the tax variable.

⁴⁵ Except for asset maturity and a measure of leverage, we note that the firm-specific determinants of debt maturity structure are also determinants of basic capital structure.

4.3 The Empirical Framework

With a view to determine which set of factors – firm, industry, or country factors – are more important determinants of debt maturity, Fan et al. (2008) employ a sequential approach to modelling debt maturity structure. We used a similar approach in this chapter. Firstly, we analyze the data using a baseline model (Model 1) that defines debt maturity as a linear function of firm characteristics($X'_{i,t}^f$) that have been used in past cross-sectional studies⁴⁶.

The model can be written as:

$$DM_{i,t} = \alpha' + X'_{i,t}^f \beta'_f + \varepsilon'_{i,t} \quad (1)$$

where $DM_{i,t}$ denotes debt maturity structure, $X'_{i,t}^f$ is a vector of firm characteristics, β'_f is a column vector containing the corresponding coefficients.

Secondly, we control for industry effects by introducing dummies (D'_i^s) for each industry to examine if the industry in which a firm operates matter in debt maturity decisions of a firm (Model 2). The model is written as:

$$DM_{i,t} = \alpha' + X'_{i,t}^f \beta'_f + \sum_s \beta'_s D'_i^s + \varepsilon'_{i,t} \quad (2)$$

where D'_i^s is a dummy variable for industry classification to which firm i belongs and β'_s is the corresponding coefficient. To avoid a dummy variable trap problem⁴⁷, we used the manufacturing industry as a reference industry⁴⁸. Thus, the coefficient β'_s is interpreted as

⁴⁶ The reader is reminded to note that the notation used to represent firm-specific determinants of debt maturity structure - ($X'_{i,t}^f$) – is different from the notation used to represent firm-specific determinants of basic capital structure which is ($X_{i,t}^f$). So β'_f is different from β_f . Similar notation patterns were used for other factors in the equations.

⁴⁷ ‘Dummy variable trap’ refers to a situation where we experience perfect (multi)collinearity among independent variables due to inclusion of dummy variables for all of the groups while the model has an overall intercept. Hence, since we opted to have an overall intercept in our model, the number of dummy variables introduced must be one less than the categories of that variable to avoid this problem.

⁴⁸ Prof. Kalu Ojah of the Wits Business School was of the view that it would be of interest to see how results would look like if one was to use the agriculture sector as a reference sector as it is still the main stay of most

the significance of debt maturity structure of an industry relative to firms in the manufacturing industries.

Thirdly, we further control for cross-country variations by introducing country dummies to see if the country in which a firm operates matter in debt maturity decisions of a firm (Model 3). The model is written as:

$$DM_{i,t} = \alpha' + X'_{i,t} \beta'_f + \sum_s \beta'_s D'^s_i + \sum_c \beta'_c D'^c_i + \varepsilon'_{i,t} \quad (3)$$

where D'^c_i is a country-dummy and β'_c is the corresponding coefficient. Again, to avoid a dummy variable trap problem, we use South Africa as a reference group. South Africa was considered as a reference group since it arguably has the most advanced institutional and macroeconomic infrastructure among sample countries (e.g., Gwatidzo and Ojah 2009).

Fourthly, we introduce legal, market, and macroeconomic variables that broadly define cross-country differences in institutions and macroeconomic characteristics (Model 4). At this stage, we particularly introduce dummy variables for origin of legal systems (D'^L_i) - that is, 1 for English common law based legal systems, and 0 for French civil law based legal systems - and economic development (D'^Y_i) - that is, upper middle income groups, lower middle income group, and low income group. We also include the interaction variables between country and firm characteristics to examine how cross-sectional determinants of debt maturity structure vary from country to country. The model is as follows:

$$DM_{i,t} = \alpha' + X'_{i,t} \beta'_f + \sum_L \beta'_L D'^L_i + \sum_Y \beta'_Y D'^Y_i + \sum_L \sum_Y \beta'_{L*Y} D'^L_i D'^Y_i + \varepsilon'_{i,t} \quad (4)$$

where D'^L_i is a dummy variable for legal group to which firm i belongs and β'_L is a column vector containing the corresponding coefficients; D'^Y_i is a dummy variable for income group to which firm i belongs and β'_Y is a column vector containing the corresponding coefficients.

African economies. However, we could not heed his suggestions as we didn't have enough number of listed firms from the agriculture sector in all the countries we considered.

Finally, in Model 5, we replace legal and macroeconomic variables that broadly define country characteristics by more specific legal, market and macroeconomic variables ($X'_{i,t}^C$). The model is written as follows:

$$DM_{i,t} = \alpha + X'_{i,t} \beta'_f + \sum_s \beta'_s D'^s_i + X'_{i,t} \beta'_c + \varepsilon'_{i,t} \quad (5)$$

where $X'_{i,t}^C$ is a vector of institutional and macroeconomic variables that are known to effect on debt maturity structure and β'_c is a column vector containing the corresponding coefficients.

4.4 Results and Discussion⁴⁹

4.4.1 Descriptive statistics

The debt maturity of African firms had evolved over the sample period. We present descriptive statistics of the dependent and independent variables in Table 4.2. The overall mean of debt maturity of all firms included in the sample is 22.5 per cent; while it varied from a high of 19.7 per cent in 2003 to a high of 27.0 per cent in 2008.

(Insert Table 4.2 about here)

We note two salient patterns in the maturity choices of African firms. Firstly, we observe that debt maturity was varying over time. This is considered as an early indication that African firms might be attempting to adjust their debt maturity structure toward a target. Secondly, especially in the latter half of the sample period, we note a general upward trend in debt maturity structure. Specifically, it went from a low of 19.7 per cent in 2003 to a high of 27.0 per cent in 2008. As theory suggests, this trend could be attributed to the confluence of expansion in the economies and stock markets of our sample countries. It could also be due to

⁴⁹ We used the same dataset, except for data on additional variables and variables which were not relevant, as in Chapter 2.

the steady increase observed in profitability, growth opportunities, firm size, asset maturity and leverage experienced by firms in sample countries.

(Insert Table 4.3 about here)

We probe the descriptive statistics to see if there are inter-industry variations in debt maturity structures (Table 4.3 - Panel A). An inspection of the results pertaining to industry means of debt maturities indicates that the average debt maturities of industries are rather heterogeneous. For instance, firms in Oil and Gas and Regulated industries have the longest debt maturities while those in Health and Business Equipment have the shortest debt maturities. This could be a reflection of inter-industry variations in agency costs, information asymmetries, liquidity, and asset structure.

One of the goals of this chapter is to examine if country characteristics have any effect on debt maturity structure of a firm. As a first pass at this issue, we consider how debt maturity ratios vary across countries, legal origin, and income groups. In Table 4.3 -Panel B, we observe that the debt maturity ratios vary considerably across countries ranging from a high of 41 per cent for firms in Kenya to a low 11.2 per cent for those in Ghana. Furthermore, firms in civil law countries seem to have shorter average debt maturities - 17.3 per cent - than those in common law countries - 30.7 per cent (Table 4.3 - Panel C). Similarly, we note variations in the ratio across income groups. Upper-middle-income countries have the longest debt maturities while those in lower-middle-income countries have the shortest debt maturities. This variation in debt maturity structure of sub-samples is an early indication of potential heterogeneity in underlying factors that determine debt maturity.

Previous cross-country studies on debt maturity structure report that firms in developing countries exhibit shorter maturity periods than those in the developed world (e.g., Demirgüç-Kunt and Maksimovic 1999; Fan et al. 2008). Along similar lines, we assess whether the debt maturity ratios in our sample countries are comparable to those found in

countries considered in Terra (2011) and Antoniou et al. (2006). Although the average debt maturity ratio of firms in our sample countries are closer to those in Latin American countries reported in Terra (2011), it is lower than those reported for firms in USA, France, UK, and Germany indicating a higher dependence on short-term financing (Table 4.4). This seems to be consistent with Deesomsak et al. (2009), Fan et al. (2008) and Demirgüç-Kunt and Maksimovic (1999) who suggest that firms in developing countries tend to use far less long-term debt than those in developed countries.

(Insert Table 4.4 about here)

Earlier in this chapter, we indicated that most of the firm-specific determinants of debt maturity structure (i.e., except for asset maturity and leverage variables) are also determinants of basic capital structure. Also, somewhere in Chapter 3, we reported existence of inter-temporal, inter-industry and cross-country variations in those variables for the sample firms. Furthermore, again elsewhere in Chapter 3, we indicated similar variations in the three measures of leverage. In an unreported result, we note that firms in Mauritius and Kenya had assets with the longest maturity while those in South Africa and Morocco had assets with the shortest maturity. Overall, these observations affirm the view that firm characteristics exhibit inter-temporal, inter-firm, inter-industry and cross-country variations. We conjecture that these differences might have resulted in differences in maturity structure of firms.

We also note that the country-specific determinants of debt maturity structure are also determinants of basic capital structure. Chapter 3 presented a detailed description of the inter-temporal and cross-country variation in those variables. As in basic capital structure, we conjecture that the variation in the institutional and macroeconomic conditions of the sample countries might have resulted in cross-country disparity in access to external finance and diversification opportunities available to firms which in turn might have caused the observed cross-country variation in debt maturity structure.

We present correlation coefficients of variables along with their statistical significances in Table 4.5. A perusal of this table indicates that asset maturity, non-debt-related tax-shield, earnings volatility and growth opportunities are positively and significantly correlated with debt maturity while we observe a significantly inverse association between profitability and dividend payout and debt maturity.

(Insert table 4.5 about here)

In terms of country characteristics, our results indicate a positive association between GDP per capita and its growth rate; size and liquidity of stock market; shareholder and creditor rights protection and rule of law; and debt maturity. On the other hand, size of banking sector variable is inversely correlated with debt maturity.

4.4.2 Regression analyses

In this section, we report regression results and their interpretation for Equations 1 up to 5. A battery of estimation procedures were considered to examine if results are robust to econometric procedures.

4.4.2.1 Firm characteristics

We begin our regression analysis with a perusal of results of the baseline regression model (Model 1) which specifies only firm specific factors as the independent variables. Table 4.6 presents the parameter estimates and their statistical significance (or lack of it) for a range of estimation procedures.

(Insert table 4.6 about here)

Our results indicate a broadly positive and significant relationship between earnings volatility and debt maturity variables corroborating Flannery's (1986) argument that riskier

borrowers are not able to cover cost of rolling short-term debt and prefer long-term debt, while low-risk borrowers stick to short-term debt. However, it is in disagreement with Kane et al. (1985) and Sarkar (1999) who argue that low variability in firm value inspires the managers to issue long-term debt rather than short-term debt since such managers may want to avoid potential risk of bankruptcy.

Table 4.6 also shows that firm profitability and dividend payout ratio and debt maturity structure are inversely related providing support for the view that short-term debt issuance is perceived by the market as good news that cannot be imitated by firms with bad quality, and hence, debt maturity should be a decreasing function of profitability and dividend payout (e.g., Flannery 1986). In a study of US industrial firms, Ferreira et al. (2011) report that firms that do not pay dividends are more likely to be financially constrained and less likely to be able to issue long-term debt.

We also note that the relationship between asset maturity and debt maturity is positive, although not robust to econometric procedures proffering a partial support to maturity-matching hypothesis and results reported in Hart and Moore (1994), Stohs and Mauer (1996), Graham and Harvey (2001), Körner (2006), Cai et al. (2008) and Correia (2008). Similarly, the results show that non-debt-related tax-shield has a direct influence on debt maturity structure.

We observe a robust and significantly positive relationship between the level of a firm's leverage and its debt maturity structure confirming the notion by Stohs and Mauer (1996) that a firm lengthens its debt maturity as leverage increases in order to offset the higher probability of liquidity crises and thus delay exposure to bankruptcy risk. However, it is in contrast with the argument by Myers (1977) that firms may use leverage and debt maturity to mitigate the agency problems of under-investment. Our findings are similar with

those reported in Barclay and Smith Jr. (1995), Stohs and Mauer (1996), Antoniou et al. (2006), Körner (2006) and Deesomsak et al. (2009).

4.4.2.2 Industry characteristics

Table 4.7 presents parameter estimates for Model 2 using a range of estimation procedures.

(Insert table 4.7 about here)

Our results indicate that firms in Oil & Gas, Regulated and Service industries tend to have longer debt maturity structures relative to those in Manufacturing industries. On the other hand, firms in Durables, Chemical and Construction, Business Equipment, Wholesale and Retail and Health industries tend to have shorter debt maturity structures relative to those in Manufacturing industries. These findings support the view that industry characteristics such as technologies and assets employed in industries and regulations to which industries are subjected to influence financing decisions of firms in those industries (e.g., Frank and Goyal 2007). It would be interesting to examine what specific industry-characteristics influence debt maturity structure. However, such an exercise is beyond the scope of the present study.

4.4.2.3 Country characteristics

The literature on debt maturity structure presents a strong case for the possibility that a country's institutional and macro-economic factors could decisively affect a firm's debt maturity structure (e.g., Demirgüç-Kunt and Maksimovic 1999). Table 4.8 presents the results of estimating Model 3 using various estimation procedures.

(Insert table 4.8 about here)

The coefficients of Egypt, Ghana, Morocco, Nigeria and Tunisia are negative and significant indicating the fact that firms in these countries tend to have shorter debt maturity than those in South Africa (Table 4.8). This could be attributed to the relatively well-developed stock market and superior shareholder protection that epitomize South Africa.

Table 4.9 presents the estimates of Model 4 using a battery of econometric procedures.

(Insert table 4.9 about here)

The results of Model 4 indicate that the coefficient of DEV3 is negative and significant implying that firms in low-income countries tend to issue less long-term debt relative to those in upper-middle-income countries upholding findings reported in Deesomsak et al. (2009), Fan et al. (2008) and Demirgüç-Kunt and Maksimovic (1999).

Model 4 also includes interaction variables to examine if firm characteristics affect debt maturity structure differently in countries with different institutional and macroeconomic characteristics (Table 4.9). We observe that the negative influence of profitability on debt maturity is stronger in lower-middle-income and common law countries. We further note that the positive effect of asset maturity is mitigated in lower-middle-income and common law countries; in contrast, it is enhanced in low-income countries. The results also show that the positive effect of non-debt-related tax-shield is deterred in low-income countries whereas the inverse effect of dividend payout is deterred in lower-middle-income countries. Our interpretation of these results is that country characteristics, in addition to their direct impact on debt maturity structure, indirectly influence debt maturity structure by enhancing or mitigating the impact of firm-specific factors on debt maturity structure. This interpretation is consistent with Fan et al. (2008) who indicate that the relationship between firm-specific variables and debt maturity structure tends to vary across countries.

We further refine our definition of macroeconomic and institutional factors that characterize a given country in Model 5. In this model, we include 10 variables that more-narrowly-define country characteristics. Because of multicollinearity between variables, we could not include all variables in a single regression. Rather, we estimate separate regressions for a group of variables which do not have multicollinearity problems. For reasons of brevity, we present regression results of only seemingly unrelated regression (SUR) procedure in Table 4.10.

(Insert table 4.10 about here)

Our results show that growth rate of the real GDP per capita variable is negatively related with debt maturity structure. This finding does not support De Haas and Peters (2006) who argue that a firm is likely to use more long-term debt at times of economic growth. Perhaps, the prevalence of relatively short asset maturity of firms in high-growth countries might have overwhelmed the expected positive effect of economic growth on debt maturity. We also find that the influence of taxation variable on debt maturity structure is negative which is in line with the argument by Kane et al. (1985). Also evident from our results is that the relative size of banking sector of the country in which a firm operates negatively influences the firm's debt maturity confirming the argument by Demirgüç-Kunt and Maksimovic (1999) and Antoniou et al. (2006) that developed banking sector reduces creditor's costs related with information asymmetry, agency and bankruptcy.

Consistent with the argument that legal institutions determine debt maturity structure, we find that the provisions of the law with regard to investor (i.e., both shareholder and creditor) protection influence debt maturity structure of a firm directly and highly significantly. Although the positive relationship between shareholders rights protection variable and debt maturity corroborates conjectures based on agency theory, the similar relationship that we observe between creditor rights protection and debt maturity contradicts

hypothesis based on the same theory. The latter relationship could be due to the relatively small banking sector that characterized countries with high creditor rights protection index (i.e., Botswana, Nigeria, and Kenya) in our sample.

Our results also indicate that size of stock market in a given country positively and significantly influences debt maturity, as Giannetti (2003) also find. This finding supports the view that developed stock markets reduce information asymmetry problems and hence increase a firm's ability to obtain long-term debt. We further observe that the size of the overall economy variable is also positively and significantly related to debt maturity structure. This particular finding finds itself in sync with the argument forwarded in most of the literature (e.g., Caprio Jr and Demirgüç-Kunt 1998; Demirgüç-Kunt and Maksimovic 1999; Fan et al. 2008; Deesomsak et al. 2009).

Our results also reveal an interesting resemblance between the determinants of basic capital structure (discussed in chapter 3) and those of debt maturity structure. We note that firm- and country-level characteristics that determine the two financing decisions, in most of the cases, are identical. Given that leverage itself is one of the determinants of debt maturity, the determinants of debt maturity have both direct and indirect effects on maturity. That is, in addition to their direct influence, these variables indirectly impact on maturity through their effect on leverage. This evidence reinforces the view that leverage and maturity are jointly determined (Barclay et al. 2001).

4.5 Conclusions

This chapter went beyond issues pertinent to basic capital structure and, to a certain extent, tackled matters pertaining to debt maturity structure. We contended that debt maturity structure of firms in our sample is determined by a host of “conventional” factors including firm, industrial, institutional, and macroeconomic factors. The data was examined using a

battery of models to identify the significance of different factors. A range of standard estimation procedures were used for checking the robustness of results.

At firm level, we observe that such factors as earnings volatility, asset maturity and leverage have a positive influence on the debt maturity structure of firms in our sample. This implies that liquidity risk pressure, maturity matching and bankruptcy risk are important factors in debt maturity structure decisions of firms in our sample. On the other hand, we also document that firm profitability and dividend payout ratio inversely influence debt maturity decisions of our sample firms; this signifies the signalling role of debt maturity structure.

We also note inter-industry heterogeneity in debt maturity structure of firms in our sample countries. Specifically, firms in Oil & Gas, Regulated and Service industries incline to have longer debt maturities while those in Durables, Chemical and Construction, Business Equipment, Wholesale and Retail and Health industries incline to have shorter debt maturity. This implies that industry characteristics such as industry-specific technologies, risks, and regulations influence debt maturity decisions of firms in our sample countries.

In terms of macroeconomic variables, the chapter established that firms in low-income countries tend to issue less long-term debt relative to those in upper-middle-income countries. This was further cemented by our observation that the size of overall economy and debt maturity structure were positively related. Contrary to our expectation, the chapter also documents that growth rate of real GDP per capita variable is negatively related with debt maturity structure. This, perhaps, is due to the prevalence of relatively shorter asset maturities that epitomize firms in high-growth countries. Also, we found that the influence of taxation variable on debt maturity structure is negative as expected. These findings underscore the role that quality of law enforcement, access to external finance, maturity matching, agency problems and debt-related tax-shield play in the financing decisions of a firm.

We also note that financial deepening had a role to play in the debt maturity structure decisions of firms in our sample countries. Unlike, stock market development variables, banking sector development variables were negatively related with debt maturity structure of our sample firms. With regard to legal institutions, we found that the provisions of the law with regard to investor (i.e., both shareholder and creditor) protection influences debt maturity structure of a firm directly and highly significantly. Although the positive relationship between shareholders rights protection variable and debt maturity corroborates conjectures based on agency theory, the similar relationship that we observe between creditor rights protection and debt maturity contradicts hypothesis based on the same theory. The latter relationship could be due to the relatively small banking sector that characterized countries with high creditor rights protection index (i.e., Botswana, Nigeria, and Kenya) in our sample. Put together, the evidences suggest that agency and bankruptcy costs and information asymmetry problems do matter in the determination of debt maturity structure of a firm in our sample countries.

In addition to the direct effects, we observe that broadly defined macroeconomic and institutional variables had an indirect effect by either mitigating or enhancing the influence of firm-specific factors. For instance, in lower-middle income countries, the effect of profitability is enhanced whilst that of asset maturity and dividend payout is mitigated. Furthermore, in low-income countries, while the influence of asset maturity is enhanced that of non-debt-related tax-shield is deterred. Similarly, in common law countries, the effect of profitability on debt maturity structure is enhanced while the effect of asset maturity is mitigated. The fact that we observe some commonality between the determinants of basic capital structure and debt maturity reinforces the view that the two financing decisions are highly intertwined and, perhaps, jointly determined.

Inspired by the literature on basic capital structure, lately, the literature on debt maturity structure has witnessed endeavours that attempt to examine if firms engage in the act of rebalancing debt maturity structure toward a target. In an effort to raise the debt maturity structure debate to where it is elsewhere, in Chapter 5, the thesis examines whether the sample firms adjust their debt maturity structures toward a target, and if so, attempts to identify the factors that effect on the adjustment speed toward the target.

Table 4.1: Determinants of debt maturity structure, theoretical predictions, and empirical findings

Notes: When a theory is silent or when there is significant ambiguity regarding the appropriate interpretation, the cell is left blank. The (+/-) sign is put in a cell if plausible arguments could be made for a positive as well as a negative relationship using a given theory. $\pm$ denotes the sensitivity of empirical results either to the way the dependent variable is defined or country variations 0 denotes that there were studies which reported support for no relationship between the variable indicated and financing decisions.

Panel A: Institutional and macroeconomic characteristics and debt maturity structure

S. No	Variables	Theoretical Predictions			Summary of Empirical Results			
		Tax bankruptcy trade-off	Agency	Matching Hypothesis	Positive Influence on debt maturity structure	Negative influence on debt maturity structure	$\pm$	No influence on debt maturity structure
1.	Shareholder Rights		+		Deesomsak et al. (2009)			
2.	Rule of Law		+		Deesomsak et al. (2009) Fan et al. (2008) Demirguc-Kunt & Maksimovic (1999)			
3.	Creditor Rights		-			Deesomsak et al. (2009)		
4.	Taxation	-			Scherr & Hulburt (2001)		Antoniou et al. (2006)	Guedes & Opler (1996)
5.	Inflation			-		Demirguc-Kunt & Maksimovic (1999)		Fan et al. (2008)
6.	Size of economy			+	Fan et al. (2008)	Deesomsak et al. (2009)		
7.	Economic Growth		-			Demirguc-Kunt & Maksimovic (1999)		
8.	Market Capitalization		+/-				Deesomsak et al. (2009) Demirguc-Kunt & Maksimovic (1999)	
9.	Stock Market Turnover		+/-				Deesomsak et al. (2009) Demirguc-Kunt & Maksimovic (1999)	
10	Size of Banking Sector		-				Deesomsak et al. (2009) Demirguc-Kunt & Maksimovic (1999)	

Panel B: Firm characteristics and debt maturity structure

S. No	Variables	Theoretical Predictions					Summary of Empirical Results			
		TBT	Agency	MH	LH	ST*	Positive influence on debt maturity structure	Negative influence on debt maturity structure	±	No influence on debt maturity structure
1.	Firm size		+			+	Singh(2009), Deesomsak et al. (2009), Ozkan (2002), Morris (2009), Fan et al. (2008), Korner (2006), Demiruc-Kunt and Maksimovic (1999)	Barclay and Smith Jr. (1995), Guedes & Opler (1996), Scherr & Hulburt (2001), Heyman et al. (2003)	Antoniou et al. (2006)	
2.	Profitability	+				-	Scherr & Hulburt (2001), Fan et al. (2008)		Deesomsak et al. (2009),	
3.	Growth opportunities	-	-		+		Körner (2006), Stohs & Mauer (1996), Garcia-Teruel & Martinez-Solano (2007), Cai et al. (2008).	Barclay & Smith Jr (1995), Goyal et al. (2002), Johnson (2003)		Korner (2006)
4.	Asset maturity		+	+			Correia (2008), Cai et al. (2008), Hart and Moore (1994), Stohs & Mauer (1996), Graham & Harvey (2001), Körner (2006)		Fan et al. (2008), Deesomsak et al., (2009), Antoniou et al. (2006)	
5.	Earnings volatility	-	-			+/-		Guedes & Opler (1996), Stohs & Mauer (1996), Scherr & Hulburt (2001), Ozkan (2002), Stephane et al. (2011)	Deesomsak et al. (2009), Antoniou et al. (2006), Terra (2011)	Korner (2006)
6.	Tax shield	-								
7.	Dividend policy		-			-		Ferreira (2010)		
8.	Leverage		-		+		Antoniou et al. (2006), Korner (2006), Stohs & Mauer (1996), Barclays and Smith Jr (1995), Deesomsak et al. (2009)			

Note: **TBT** denotes tax/bankruptcy trade-off theory; **MH** denotes Matching Hypothesis; **LH** denotes Liquidity Hypothesis; **ST** denotes Signalling Theory.

Table 4.2; Evolution of firm and country characteristics**Panel A: Descriptive statistics of firm characteristics**

Year	Firm Size	Earnings Volatility	Profitability	Growth Opportunities	Asset Maturity	Dividend Payout	Tax shield	Total Leverage	Debt Maturity
1999	5.221	0.244	0.274	0.024	9.815	0.293	0.031	0.413	0.243
2000	5.108	0.270	0.059	0.034	7.153	0.634	0.030	0.448	0.236
2001	5.150	0.274	0.124	0.058	11.870	0.553	0.038	0.488	0.258
2002	4.968	0.216	0.086	0.029	18.121	0.675	0.036	0.501	0.214
2003	4.961	0.235	0.094	0.056	16.793	0.687	0.036	0.500	0.197
2004	4.973	0.219	0.106	0.053	12.167	0.632	0.034	0.500	0.201
2005	5.067	0.234	0.118	0.035	14.204	0.584	0.033	0.499	0.218
2006	5.170	0.208	0.114	0.078	10.002	0.601	0.031	0.498	0.223
2007	5.321	0.225	0.130	0.086	8.288	0.614	0.031	0.490	0.250
2008	5.417	0.209	0.122	0.075	14.322	0.613	0.033	0.476	0.270
Overall	5.116	0.224	0.112	0.059	12.970	0.619	0.034	0.493	0.225

Panel B: Descriptive statistics of institutional and macroeconomics characteristics

Year	Taxation	Inflation	Size of Economy	Growth of Economy	Size of Stock Market	Liquidity of Stock Market	Size of Banking Sector	Creditor Rights	Shareholder Rights	Rule of Law
1999	35.108	4.098	3.188	2.332	73.484	26.960	0.660	2.384	3.550	.
2000	34.985	4.213	3.199	2.621	58.206	28.824	0.657	2.384	3.550	-0.077
2001	34.985	4.821	3.206	1.677	46.577	18.948	0.691	2.384	3.550	.
2002	34.985	5.363	3.210	1.034	61.606	30.713	0.702	2.384	3.550	-0.102
2003	34.863	5.797	3.220	2.206	62.971	20.428	0.699	2.384	3.550	-0.125
2004	34.863	8.252	3.233	3.202	85.285	23.278	0.705	2.384	3.550	-0.036
2005	34.863	5.530	3.246	2.980	112.525	35.167	0.709	2.384	3.550	-0.030
2006	34.531	7.001	3.266	4.609	125.792	44.854	0.691	2.384	3.550	-0.099
2007	23.404	8.021	3.285	4.592	144.504	42.829	0.679	2.384	3.550	-0.119
2008	23.404	NA	NA	NA	NA	51.166	.	2.384	3.550	-0.100
Overall	32.599	5.899	3.228	2.806	85.661	32.317	0.688	2.384	3.550	0.086

Notes: Debt maturity refers to the average of the ratio of a firm's non-current liabilities to total liabilities. The exact definition of the other variables is as indicated in Table 2.3 in chapter 2.

Table 4.3: Summary statistics of debt maturity structure by sub-samples

Panel A: By industry				Panel A: By country				Panel B: By legal Origin			
	Mean	SD*	Obs#		Mean	SD*	Obs#		Mean	SD*	Obs#
Non-durables	0.209	0.240	1 019	Egypt	0.153	0.231	2 706	Common law	0.307	0.249	2 138
Durables	0.181	0.193	167	South Africa	0.310	0.242	1 669	Civil law	0.173	0.233	3 344
Manufacturing	0.222	0.238	926	Botswana	0.332	0.295	74				
Oil & Gas	0.394	0.285	386	Ghana	0.112	0.156	53				
Chem. & Construction	0.185	0.236	523	Kenya	0.416	0.276	151				
Business Equipment	0.162	0.184	347	Mauritius	0.393	0.204	173				
Regulated	0.301	0.271	306	Morocco	0.159	0.182	289				
Wholesale & Retail	0.182	0.216	711	Nigeria	0.239	0.244	191				
Health	0.140	0.214	278	Tunisia	0.292	0.214	176				
Service & Others	0.270	0.268	810								

Notes: * denotes standard deviation; # denotes number of observations. The exact definition of the variables is as presented in Tables 2.2 and 2.4 in chapter 2.

Table 4.4: Debt maturity ratios reported in prior empirical studies

Panel A: Average Debt Maturity Ratios Reported in Antonio et al. (2006)			
Country	Mean	Std. dev	Obs.
France	0.590	0.270	3160
Germany	0.530	0.310	5882
UK	0.460	0.340	32 339

Panel B: Average Debt Maturity Ratios Reported in Terra (2011)			
Country	Mean	Std. dev	Obs.
Argentina	0.337	0.259	621
Brazil	0.379	0.263	4 100
Chile	0.408	0.287	1 770
Colombia	0.375	0.255	283
Mexico	0.433	0.265	1 411
Peru	0.279	0.371	1 032
Venezuela	0.396	0.222	175
USA	0.525	0.267	5 028

Source: Antonio et al. (2006) "The determinants of debt maturity structure: evidence from France, Germany and the UK." *European Financial Management* 12(2): 161-194.
and Terra (2011) "Determinants of corporate debt maturity in Latin America." *European Business Review* 23(1): 45-70.

Table 4.5: Pairwise Correlation Matrix

	Debt Maturity [1]	Firm Size [2]	Earnings Volatility [3]	Profit. [4]	Growth Opprt. [5]	Asset Maturity [6]	Div. Pay [7]	Tax Shield [8]	Taxation [9]	Inflation [10]	Size of Economy [11]	Grwth of Economy [12]	Size of Stk Mkt [13]	Liq. of Stk Mkt [14]	Size of Bnk'g [15]	Creditor Rights [16]	Shareholder Rights [17]	Rule of Law [18]
[1]	1.000 ***																	
[2]	0.016	1.000 ***																
[3]	0.052 ***	-0.044 ***	1.000 ***															
[4]	-0.031 **	0.077 ***	-0.011	1.000 ***														
[5]	0.046 ***	0.111 ***	0.077 ***	0.124 ***	1.000 ***													
[6]	0.071 ***	-0.077 ***	0.016	-0.019	0.004	1.000 ***												
[7]	-0.079 ***	-0.031	0.134 ***	-0.040 **	-0.121 ***	0.057 **	1.000 ***											
[8]	0.116 ***	0.029 **	-0.020	-0.010	0.003	-0.107 ***	0.045 **	1.000 ***										
[9]		-0.186 ***	0.006	-0.050 ***	-0.039 ***	0.031 **	0.090 ***	-0.005	1.000 ***									
[10]	-0.022	0.023 *	-0.011	0.034 **	0.048 ***	-0.005	-0.115 ***	-0.117 ***	-0.394 ***	1.000 ***								
[11]	0.143 ***	0.034 **	0.022	-0.031 **	0.018	-0.024	0.127 ***	0.128 ***	-0.070 ***	-0.398 ***	1.000 ***							
[12]	0.052 ***	0.081 ***	-0.024	0.008	0.041 ***	-0.044 ***	-0.008	0.006	-0.235 ***	0.150 ***	0.106 ***	1.000 ***						
[13]	0.176 ***	0.145 ***	0.041 **	0.029 **	0.057 ***	-0.042 ***	-0.019	0.023	-0.347 ***	-0.051 ***	0.649 ***	0.161 ***	1.000 ***					
[14]	0.062 ***	0.092 ***	0.022	0.008	0.029 **	-0.022	0.034 *	0.010	-0.213 ***	-0.026 **	0.513 ***	0.363 ***	0.696 ***	1.000 ***				
[15]	-0.106 ***	-0.096 ***	0.011	-0.068 ***	0.001	0.045 ***	0.157 ***	0.042 ***	0.533 ***	-0.475 ***	0.669 ***	-0.053 ***	0.245 ***	0.330 ***	1.000 ***			
[16]	0.201 ***	0.178 ***	0.034 **	0.061 ***	0.026 *	-0.019	-0.124 ***	-0.101 ***	-0.384 ***	0.350 ***	-0.200 ***	-0.135 ***	0.325 ***	0.062 ***	-0.532 ***	1.000 ***		
[17]	0.206 ***	0.127 ***	0.052 ***	0.033 **	0.044 ***	-0.039 **	-0.111 ***	0.028 **	-0.346 ***	0.125 ***	0.435 ***	-0.041 ***	0.747 ***	0.388 ***	-0.073 ***	0.515 ***	1.000 ***	
[18]	0.057 ***	-0.035 **	0.021	-0.011	0.005	0.003	0.097 ***	0.096 ***	0.129 ***	-0.457 ***	0.852 ***	-0.080 ***	0.338 ***	0.217 ***	0.769 ***	-0.516 ***	0.144 ***	1.000 ***

Notes: The table reports the Pairwise correlation coefficients between the independent variables. Correlation coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Tables 4.2 in chapter 4 and 2.3 in chapter 2.

Table 4.6: Firm characteristics and debt maturity structure

Dependent Variable: NCL_TL	OLS	Random Effects	Fixed Effects	GMM	SUR
Earnings Volatility	0.091 **	0.033 *	0.021	0.016 *	0.101 ***
Firm Size	0.003	0.006	0.041	0.014	-0.006
Profitability	-0.106	-0.150 ***	-0.136 **	0.022	-0.174 ***
Growth Opportunities	0.034	0.001	-0.024	-0.070	0.029
Asset Maturity	0.001 ***	-0.001 **	-0.001 **	0.005 *	0.001 **
Dividend Payout	-0.022 **	-0.009	-0.007	-0.033 *	-0.022 ***
Tax Shield	1.350 ***	0.667 ***	0.282	-1.202	1.450 ***
Leverage	0.212 ***	0.244 ***	0.276 ***	0.629 ***	0.211 ***
Constant	0.047	0.063	-0.133	0.005	0.152 ***
F-statistic	7.980 ***	-	3.590 ***		-
Chi2	-	13893.5 ***	-	127.82 ***	189.10 ***
Hausman Test	-	59.970 ***	59.970 ***		-
N	1600	1600	1600	1576	1600

Notes: The table reports the regression results for debt maturity structure using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 4.7: Firm characteristics, industry classification and debt maturity structure

Dependent Variable: NCL_TL	OLS	Random Effects	Fixed Effects	GMM	SUR
Earnings Volatility	0.082 **	0.033 *	0.021	0.009	0.092 ***
Firm Size	0.010	0.012	0.041	0.021	0.001
Profitability	-0.134 *	-0.155 ***	-0.136 **	-0.023 *	-0.202 ***
Growth Opportunities	0.034	-0.002	-0.024	-0.058	0.028
Asset Maturity	0.001 **	-0.001 **	-0.001 **	-0.001	0.001 **
Dividend Payout	-0.020 *	-0.009	-0.007	-0.033 *	-0.020 ***
Tax Shield	1.050 ***	0.543 **	0.282	-1.011	1.160 ***
Leverage	0.223 ***	0.248 ***	0.276 ***	-0.614 ***	0.222 ***
Non-durables	-0.010	0.002	-	-0.041	-0.008
Durables	-0.067	-0.032	-	-0.127	-0.068 **
Oil and Gas	0.116 **	0.132 **	-	0.047	0.119 ***
Chem. & Construction	-0.053	-0.045	-	0.037	-0.054 ***
Business Equipment	-0.095 **	-0.100 ***	-	-0.112	-0.101 ***
Regulated	0.105 **	0.106 **	-	0.005	0.097 ***
Wholesale and Retail	-0.069 **	-0.067 **	-	-0.025	-0.068 ***
Health	-0.048	-0.047	-	-0.005	-0.048 **
Service & etc.	0.053	0.064 *	-	-0.017	0.042 **
Constant	0.026	0.030	-0.133	-0.013	0.126 ***
F-statistic	6.360 ***	-	3.590 ***		-
Chi2	-	14809.3 ***	-	154.97 ***	308 ***
Hausman Test	-	17.480	17.48		-
N	1600	1600	1600	1576	1600

Notes: The table reports the regression results for debt maturity structure using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 4.8: Firm, industry and country dummies and debt maturity structure

Dependent Variable: NCL_TL	OLS	Random Effects	Fixed Effects	GMM	SUR
Earnings Volatility	0.080 **	0.031 *	0.021	0.041	0.086 ***
Firm Size	-0.002	-0.004	0.041	0.027	-0.009
Profitability	-0.163 **	-0.164 ***	-0.136 **	0.099	-0.209 ***
Growth Opportunities	0.031	0.005	-0.024	-0.098 *	0.029
Asset Maturity	0.001 **	-0.001 **	-0.001 **	-0.001	0.001 **
Dividend Payout	-0.014	-0.008	-0.007	0.028	-0.014 **
Tax Shield	0.840 **	0.489 **	0.282	-1.172	0.926 ***
Leverage	0.171 ***	0.220 ***	0.276 ***	0.555 ***	0.172 ***
Non-durables	-0.024	-0.007	-	-0.060	-0.022
Durables	-0.092 **	-0.056	-	-0.087	-0.091 ***
Oil and Gas	0.038	0.059	-	-0.044	0.044
Chem. & Construction	-0.046	-0.042	-	0.028	-0.047 **
Business Equipment	-0.151 ***	-0.161 ***	-	-0.252 *	-0.151 ***
Regulated	0.068	0.057	-	0.017	0.063 ***
Wholesale & Retail	-0.120 ***	-0.118 ***	-	-0.080	-0.118 ***
Health	-0.049	-0.044	-	-0.145	-0.048 **
Service & etc.	0.022	0.038	-	-0.164	0.015
Egypt	-0.186 ***	-0.179 ***	-	-0.130 *	-0.174 ***
Botswana	0.064	0.031	-	0.624	0.066
Ghana	-0.157 *	-0.193 ***	-	0.065	-0.166 ***
Kenya	-0.011	-0.027	-	0.124	-0.007
Mauritius	0.055	0.079	-	0.119	0.063 *
Morocco	-0.172 ***	-0.137 ***	-	-0.260 **	-0.152 ***
Nigeria	-0.096 *	-0.095 *	-	0.033	-0.082 ***
Tunisia	-0.080 *	-0.075 *	-	-0.114	-0.081 ***
Constant	0.281 ***	0.280 ***	-0.133	0.131	0.342 ***
F-statistic	9.61 ***	-	3.590 ***	-	-
Chi2	-	14935.66 ***	-	213.70 ***	503.900 ***
Hausman Test	-	24.75 *	24.750 *	-	-
N	1600	1600	1600	1576	1600

Notes: The table reports the regression results for debt maturity structure using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 4.9: Firm, industry, institutional and macroeconomic dummies and debt maturity structure

Dependent Variable: NCL_TL	OLS	Random Effects	Fixed Effects	GMM	SUR
Earnings Volatility	0.062	0.0016	-0.070 **	-0.380	0.079
Firm Size	0.012	0.0012	-0.124 *	-0.017	0.007
Profitability	-1.540 *	0.0407	0.288	1.510	-1.791 **
Growth Opportunities	-0.464	0.0217	0.257	-0.943	-0.352
Asset Maturity	0.013 **	0.0024	0.001	1.131	0.013 ***
Dividend Payout	0.021	0.0280 **	0.015	0.021	0.022
Tax Shield	0.861	-2.0642	0.630	0.237	1.118
Leverage	0.170 ***	0.2114 ***	0.271 ***	0.530 ***	0.172 ***
Non-durables	-0.014	-0.003	-	-0.067	-0.012
Durables	-0.061	-0.037	-	-0.126	-0.062 **
Oil and Gas	0.043	0.063	-	-0.096	0.049 *
Chem. & Construction	-0.032	-0.035	-	-0.122	-0.035 *
Business Equipment	-0.113 ***	-0.138 ***	-	-0.155	-0.114 ***
Regulated	0.058	0.070	-	0.052	0.052 **
Wholesale and Retail	-0.090 ***	-0.104 ***	-	-0.200	-0.088 ***
Health	-0.041	-0.041	-	-0.095	-0.040 *
Service & etc.	0.045	0.049	-	-0.046	0.037 **
Common	0.138	-0.042	-	-1.616	0.100
Dev2	-0.249	-0.316	-	-0.818	-0.240
Dev3	-0.301	-0.050	-	-0.478	-0.282 *
Common*Profitability	1.350	-0.082	-0.157	0.856	1.598 **
Common*Asset Maturity	-0.011 **	-0.002	0.001	0.385	-0.011 ***
Common*Tax Shield	0.687	3.956 **	1.797	-0.007	0.663
Common*Growth Opport.	0.362	-0.067	-0.397 **	0.413	0.235
Common*Earnings Vol.	0.097	0.061	0.083	-0.047	0.084
Common*Firm Size	-0.047	-0.028	0.229 **	-0.023	-0.044
Dev2*Earnings Vol.	-0.017	0.029	0.100 ***	-0.059 *	-0.025
Dev3*Earnings Vol.	-0.070	0.036	0.009	0.899	-0.057
Dev2*Div. Payout	-0.042 **	-0.038 ***	-0.024	0.110	-0.043 **
DEV3*Div. Payout	-0.025	-0.049 ***	-0.029	0.037	-0.030
DEV2*Growth Opport.	0.508	-0.024	-0.279	0.026	0.396
DEV3*Growth Opport.	-0.001	0.057	0.162	-1.597	0.026
DEV2*Firm Size	0.001	0.009	0.160 **	0.131	-0.001
DEV3*Firm Size	0.023	0.005	-0.136	-1.071	0.023
DEV2*Profitability	1.380	-0.256	-0.506 *	-0.107	1.571 **
DEV3*Profitability	0.132	-0.111	-0.298	-0.906	0.118
DEV2*Asset Maturity	-0.013 **	-0.003	-0.001	-0.464	-0.013 ***
DEV3*Asset Maturity	0.038 ***	0.004	-0.026	0.594	0.039 ***
DEV2*Tax Shield	0.241	2.557	-0.515	0.333	0.041
DEV3*Tax Shield	-1.700	-1.552	-2.559 *	-0.093	-1.897 *
Constant	0.264	0.358	-0.089	-0.318	0.333 *
F-statistic	29.52 ***	-	7.150 ***	-	-
Chi2	-	13487.54 ***	-	469.64 ***	1069.350 ***
Hausman Test	-	80.480 ***	80.480 ***	-	-
N	1600	1600	1600	1670	1600

Notes: The table reports the regression results for debt maturity structure using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

Table 4.10: Firm, industry, institutional & macroeconomic factors & maturity structure

Dependent Variable:									
NCL_TL	Model A		Model B		Model C		Model D		Model E
Earnings Volatility	0.0655	*	0.1100	**	0.0681	**	0.0725	**	0.0636 *
Firm Size	0.0005		0.0148		-0.0021		0.0008		-0.0062
Profitability	-0.2130	**	-0.2810	***	-0.2170	**	-0.2270	***	-0.2390 **
Growth Opt.	0.0453		0.0239		0.0335		0.0320		0.0308
Asset Maturity	0.0002		0.0003		0.0002		0.0002		0.0002
Dividend Payout	-0.0234	**	-0.0225	*	-0.0165		-0.0171	*	-0.0165 *
Tax Shield	1.2300	***	1.3700	***	1.3100	***	1.1400	***	1.3600 ***
Leverage	0.1990	***	0.2150	***	0.2140	***	0.1830	***	0.1960 ***
Non-durables	-0.0049		-0.0180		-0.0073		-0.0132		-0.0117
Durables	-0.0750	*	-0.0885		-0.0743		-0.0750		-0.0731
Oil and Gas	0.0882	*	0.1140	**	0.0894	*	0.0811		0.0807
Chem. & Construction	-0.0529		-0.0756	*	-0.0542		-0.0496		-0.0510
Business Equipment	-0.1100	***	-0.1170	***	-0.1060	**	-0.1120	***	-0.0966 **
Regulated	0.1100	*	0.0806		0.1070	*	0.1100	*	0.0989 *
Whole & Retail	-0.0656	**	-0.1110	***	-0.0576	*	-0.0850	***	-0.0655 **
Health	-0.0515		-0.0258		-0.0490		-0.0507		-0.0450
Service & etc.	0.0148		0.0203		0.0209		0.0163		0.0117
Economic Growth	-0.0044		-0.0443	***	-0.0028		-0.0118	*	
Shareholder Rights	0.0355	***					0.0392	***	
Rule of Law	-0.0179								
Taxation			-0.0071	**					
Stock Market Liq.			0.0728						
Inflation					0.0045				
Stock Market Size					0.0420	***			
Banking Sector Size							-0.1690	**	
Creditor Rights									0.0554 ***
Size of Economy									0.1010 **
Constant	0.0000		0.0000		-0.0722		0.0089		0.0000
F-statistic	-		-		-		-		-
Chi2	1274.5	***	715.81	***	258.05	***	293.81	***	1344.17 ***
Hausman Test	-		-		-		-		-
N	1343		528		1371		1367		1371

Notes: The table reports the regression results for debt maturity structure using Ordinary Least Square, Random Effects, Fixed Effects, Generalized Method of Moments and Seemingly Unrelated Regression. The parameter estimates that are significantly different from zero at the 1%, 5%, and 10% level are marked with ***, **, and *, respectively. The exact definition of the variables is as presented in Table 2.3.

CHAPTER 5

WHAT DETERMINES THE ADJUSTMENT SPEED OF DEBT MATURITY

STRUCTURE OF FIRMS TOWARD A TARGET?

5.1 Introduction

The finance literature, although only lately, has made strides in explaining the debt maturity structure decisions of firms. In Chapter 4, the thesis attempted to explore the main strands of debt maturity structure theories and related empirical works to identify firm, industry, institutional and macroeconomic variables that determine debt maturity structure. It presented additional insight into the debt maturity structure debate by empirically investigating the vital role that institutions, macroeconomic conditions, industry characteristics and firm level factors play in the determination of debt maturity structure in the African setting. Increasingly, the focus in the literature has been moving beyond a mere examination of determinants of debt maturity structure to the investigation of the extent to which, and the rate at which, firms adjust their debt maturity structure towards a target level (see Jun and Jen 2003; Antoniou et al. 2006; Cai et al. 2008; Dang 2008; Deesomsak et al. 2009; Terra 2011, among others). In this chapter, the thesis attempts to bring additional insight about the debt maturity structure decisions of firms in Africa by examining whether they rebalance their debt maturity structure, and if so, what factors enhance and/or impede the rate at which they adjust towards a target.

As in Chapter 4, most prior studies on debt maturity structure investigate the influence of firm-, industry-, and country-characteristics on debt maturity choices of firms (e.g., Barclay and Smith Jr 1995; Demirguc-Kunt and Maksimovic 1996; Guedes and Opler 1996; Stohs and Mauer 1996; Ozkan 2002; Fan et al. 2008). Although such studies enhance our

understanding of the complexities involved in a firm's debt maturity decisions, they exhibit three shortcomings. Firstly, they employ static econometric modelling which does not account for changes in debt maturity structure of firms due to changes in the underlying factors including firm- and country-specific variables. However, we know from recently emerging studies (e.g., Jun and Jen 2003; Antoniou, Guney et al. 2006; Cai, Fairchild et al. 2008; Dang 2011; Deesomsak, Paudyal et al. 2009; Terra 2011) that there is a substantial dynamic component in the determination of a firm's debt maturity structure. Secondly, they largely focus on developed countries and, at best, on non-African countries. Except for the work by Gwatidzo (2009:149-222) on debt [source] choice of five selected countries in sub-Saharan Africa, there is no work that examines the speed of adjustment of debt maturity structures within the context of African countries. Thirdly, although debt maturity decisions not only reflect the level of the target maturity structure but also the costs and/or benefits of adjusting towards that target, we are yet to see a study that focuses on the examination of factors determining the adjustment speed of debt maturity structure. The thesis, in this chapter, aims to address these shortcomings by investigating debt maturity structure adjustment speed and its determinants within the African setting.

The contribution of this chapter to the literature is manifold. Firstly, although there has been an increasing trend towards the investigation of whether firms in advanced economies adjust their debt maturity structure toward a target; an empirical endeavour to investigate this matter within the African milieu is virtually non-existent. Hence, the work in this chapter provides an 'out of sample test' for the theories and stylized facts developed within the context of advanced economies. Secondly, although we note that the adjustment speeds reported in various studies vary widely, we are yet to see any published work (even within the context of developed countries) which attempts to explain such a variation. The thesis, in this chapter, presents a first attempt to explain the variation in debt maturity

structure adjustment speed of firms using data drawn from firms operating in selected African countries. Thirdly, the study presented in this chapter would help identify the institutions and macroeconomic conditions that enhance and/or mitigate the rebalancing activities of firms as far as their debt maturity structure is concerned. This, in turn, would help governments, policymakers and other stakeholders in crafting policies and legislations suitable for enhancing firms' rebalancing decisions.

The empirical analyses focus on 986 non-financial firms drawn from nine African economies which have functioning stock exchanges. The study covers a period of 10 years (1999 – 2008). We use system Generalized Method of Moment (GMM) estimator proposed by Blundell and Bond (1998) which takes care of problems of endogeneity and dynamic adjustment. Consistent with Terra (2011) and Deesomsak et al. (2009), we document the presence of a costly but non-instantaneous adjustment towards target maturity structure by the sample firms.

In addition to proffering evidence that firms in our sample do temporarily deviate from and partially adjust to an optimal debt maturity structure, we document that: (i) adjustment speed of debt maturity structure is positively affected by firm size and growth opportunities, and inversely affected by the gap between observed and optimal debt maturity structure; (ii) there are inter-industry and cross-country variation in adjustment speed of debt maturity structure confirming that industry and country characteristics matter in adjustment speed dynamics; (iii) firms based in the English common law legal systems adjust faster than those in the French civil law system; (v) stronger protection of investor's rights and efficient law enforcement positively affects adjustment speed of debt maturity structure; and (vi) firms in richer and fast-growing countries tend to adjust their debt maturity structure more quickly than those in poorer and slow-growing countries.

The remainder of the chapter proceeds as follows: Section 2 presents a brief review of prior studies on debt maturity structure dynamics. Section 3 develops a dynamic debt maturity structure model to measure the adjustment speed of debt maturity structure and determine the factors which determine the speed of adjustment. Section 4 presents the empirical results and discussions. Finally, section 5 concludes.

5.2 Literature Review

Traditionally, empirical research on debt maturity structure focused on the determinants of observed debt maturity ratio using static econometric models. The more recent literature, however, saw a blitz of studies that focus on the dynamic adjustment of debt maturity structure towards a target (see Ozkan 2000; Antoniou et al. 2006; Dang 2011; López-Gracia and Mestre-Barberá 2011; Terra 2011, among others). In what follows, the chapter presents a brief survey of theoretical and empirical studies that document the presence of target behaviour in debt maturity decisions of firms and also attempts to present a framework for analyzing the nexus between firm, institutional, and macroeconomic variables and adjustment speed of debt maturity structure of firms.

5.2.1 On the existence of adjustment toward a target debt maturity structure

Mainstream debt maturity structure theories, except for signalling theory, suggest that that a firm's debt maturity structure is a result of a firm's attempt to strike a trade-off between costs and/or benefits of holding varying maturities of debt. Thus, they suggest existence of target (or optimal) debt maturity structure by a firm. The literature further notes that there are inter-firm, inter-industry, cross-country and inter-temporal variations in the underlying factors that determine the optimal debt maturity structure of firms. So, it is fair to conjecture

that there is a substantial dynamic component in the determination of target maturity structure.

Researches subsequent to MM's (1958) 'irrelevance' work suggest that debt maturity structure does have a role on firm value, and thus, a firm does have an incentive to take steps to offset deviations away from target maturity structure. Further, recent empirical literature suggests not only that firms adjust their debt maturity structure toward a target but also that the adjustment is non-instantaneous. This view was shared by Ozkan (2000) who studied 429 non-financial firms in the UK and concluded that firms have long-term target ratios and they adjust to the target ratio relatively fast. They report an adjustment speed hovering around 44 per cent which indicates that the costs of being away from target ratios are considerable for firms. In their paper on the dynamics of debt maturity structures of firms in three European countries, Antoniou et al. (2006) found the presence of costly and non-instantaneous adjustments towards target maturity structure by firms in all of the three countries included in their sample. The authors report adjustment speeds ranging from 34 to 55 per cent using various model specifications.

Likewise, López-Gracia and Mestre-Barberá (2011) who examined the effect of tax on the debt maturity structure of Spanish SMEs conclude that SMEs adjust their debt maturity structure at a speed of circa 37 per cent per annum towards the target. More recently, in a study that examines the potential interactions of corporate financing and investment decisions, Dang (2011) report that the lagged debt maturity has a significant and positive influence on the debt maturity structure. The author reports adjustment speeds ranging from 60 to 62 per cent using various model specifications and estimation procedures. Similarly, Terra (2011) in a paper that examined debt maturity dynamics in seven Latin American economies, observes the existence of a substantial dynamic component in the determination of a firm's debt maturity structure. He estimates a rate of adjustment speed to the optimal

maturity structure ranging from 46 per cent to 68 per cent. Overall, recent literature strongly suggests that firms actively adjust their debt maturity structure towards a target debt maturity structure.

5.2.2 Determinants of adjustment speed of debt maturity structure

It is evident from the foregoing discussion that firms exhibit target behaviour as far as their debt maturity structure is concerned and that the pace at which they adjust varied from study to study. Part of this dissention could be attributed to econometric and sample related issues and part of it could be ascribed to disparities in costs and/or benefits of adjusting toward the target maturity structure. This triggers us to pose the question that what factors determine the costs and/or benefits of adjusting toward a target maturity structure? In what follows, the chapter presents a synthesis of firm-specific and country-level variables that influence the rate at which a firm rebalances its maturity structure toward a target.

5.2.2.1 Firm specific determinants of adjustment speed of debt maturity structure

In Chapter 4, based on a synthesis of the extant literature, we modelled the optimal debt maturity structure as a function of firm, industry, and country characteristics. Thus, here, taking cue from Flannery and Hankins (2007), we hypothesize that if the optimal debt maturity structure varies across firms, industries, and countries, so might the cost of adjusting the maturity structure and the value of maintaining the target. To the extent that adjustment costs and/or benefits matter for a firm's debt maturity structure decisions, variations in these factors will affect the speed of adjustment.

Liquidity hypothesis suggests that a firm's debt maturity structure is a result of its continued attempt to strike a balance between the benefits and costs of short-term debt. Hence, according to this hypothesis, the further a firm's maturity structure is from the

optimal, the costlier it gets for the firm to stay away from the target. Hence, we posit a straight forward proposition that adjustment speed should be a positive function of the distance between observed and target debt maturity structures. On the other hand, Loof (2004) suggests that the further a firm is from its optimal capital structure, the more likely that its adjustment speed would be slower because larger adjustments require new issues of securities which tend to be costlier than smaller adjustments which can be achieved as part of a firm's normal operation. Hence, based on this argument, we expect that the distance variable is negatively related with adjustment speed of debt maturity structure. Which of these predictions will prevail is an empirical matter.

More profitable firms face less refinancing risk as they are likely to have more financial flexibility than the un-profitable firms (e.g., Jun and Jen 2003). Hence we expect, based on liquidity hypothesis, that less profitable firms should adjust more quickly toward their optimal debt maturity structure than the more profitable ones. The literature suggests that growing firms tend to have: (i) higher agency costs as they have more flexibility in their choice of future investment (e.g., Titman and Wessels 1988); and (ii) increased cost of financial distress (e.g., Myers 1984; Myers and Majluf 1984) both of which exacerbate cost of deviating from the optimal debt maturity structure. We, therefore, anticipate that growing firms should adjust more quickly to their optimal debt maturity structure than no-growth firms.

Parallel works on basic capital structure suggest that cost of adjusting toward an optimal structure depends on financial constraints that a firm experiences (e.g., Flannery and Hankins 2007). Due to better transparency and more stable base, we expect larger firms to have lesser agency costs and financing expenses and hence more relaxed with their target adjustment decisions (e.g., Titman and Wessels 1988; Titman and Tsyplakov 2007). Hence, according to liquidity risk hypothesis, small firms need to be relatively more concerned if

they stay away from their optimal debt maturity structure, thus having to move faster to these levels. On the other hand, based on agency hypothesis, one might argue that the lesser agency costs and the resulting lower financing expenses that characterize larger firms may make adjustment a cheaper affair than their smaller counterparts.

5.2.2.2 Inter-industry heterogeneity in adjustment speed of debt maturity structure

The extant literature presents ample evidence on inter-industry variation in debt maturity structure. For instance, Barclay and Smith (1995) recognize the role of industry effects in debt maturity decisions by suggesting that firms in regulated industries choose less short-term debt because the agency costs of managerial discretion are lower in such industries. In a study of debt maturity structures of Chinese companies, Cai et al. (2008) note generally similar results with regard to the determinants of debt maturity structure across different industries. Likewise, Guedes and Opler (1996) examined the determinants of the maturity of corporate debt issues of 7 369 bonds and notes, and found that firms in utilities industry, on average, issue relatively long-term debt.

No prior empirical research has explicitly examined inter-industry heterogeneity in adjustment speed of debt maturity structures. However, in as much as industry characteristics influence a firm's debt maturity structures, so might they influence the costs and/or benefits of adjusting to (or deviating from) an optimal debt maturity structure. Following prior works on basic capital structure (e.g., Roberts 2002; Stojan and Tucker 2007; Smith et al. 2010), we conjecture that such characteristics as the nature of operation, assets and technologies, and risk and growth characteristics of the industry in which a firm operates are the underlying factors explaining inter-industry variations in adjustment speed of debt maturity structure.

5.2.2.3 Cross-country heterogeneity in adjustment speed of debt maturity structure

Unlike the adjustment speed of basic capital structure of firms toward a target, quite a few studies examine the adjustment speed of debt maturity structures in an international setting. A closer look at the adjustment speeds reported in debt maturity structure studies indicated that the speeds vary from country-to-country and region-to-region. For instance, Antoniou et al. (2006) report that French firms adjust their debt maturity structure at a faster pace (i.e., 55 per cent) than their German (i.e., 52 per cent) and British (i.e., 34 per cent) counterparts. Likewise, Deesomsak et al. (2009) observe that Australian firms have the highest adjustment speed (i.e., 71 per cent), while Malaysian firms show a relatively slow adjustment (48 per cent). We also note that Terra (2011) reports a debt maturity structure adjustment speed of 46 per cent and 68 per cent for firms drawn from seven countries in Latin America and the US, respectively. These and other disparities in adjustment speed observed elsewhere in this chapter signify the presence of country-wide factors that impact adjustment speed of debt maturity structure.

Another interesting dimension observed in maturity structure studies in the literature is the presence of inter-temporal variation in the rate at which firms adjust their debt maturity structure. Along this line, Antonio et al. (2006) note the speed of adjustment has been increasing in France and the UK while it has been declining in Germany during the sample period considered for their study. In the same way, Deesomsak et al. (2009) report varying adjustment rates for their sample countries during the pre- and post-1997 Asian financial crises. These evidences trigger a conjecture that country-level characteristics such as legal and financial institutions and macroeconomic conditions could be the underlying factors in explaining the observed cross-country variation in maturity structure adjustment speeds. As there is no published work yet which examines the role of country-wide variables on the rate

at which firms rebalance their debt maturity structure, this chapter provides additional insight in the debt maturity structure literature.

The law-and-finance literature is replete with theoretical and empirical endeavours that attempt to show that a country's legal institutions are important determinants of the complexity and terms of financial contracts between agents. At the core of the nexus between legal institutions and financial contracting is the protection afforded by legal systems to mitigate agency problems between insiders and outsiders. The law-and-finance literature further suggests that firms in countries with legal systems based on the English common law tend to have lesser agency-associated problems compared to those in countries with legal systems based on the French civil law. Therefore, we expect firms in the first group of countries to more quickly adjust their maturity structure to the optimal than those in the latter group. In a rather more direct examination of the influence of quality of the law on adjustment speed of debt maturity structure, we examine the effect of a set of more narrowly defined legal variable (i.e., shareholder rights protection, creditor rights protection, and rule of law).

Analysing cross-country variations in debt maturity structure by examining the influence of market institutions is rather a customary practice. According to Demirgüç-Kunt and Maksimovic (1998), a developed stock market and banking sector makes it easier for firms to raise long-term capital. The likely smaller transaction costs and reduced agency costs associated with developed stock markets and banking sector would mean that firms find it easier to adjust their maturity structure to the optimal. However, firms operating in countries with developed stock markets and banking sector are also likely to have more financial flexibility than those operating in countries with less developed financial sectors. Hence, we expect that firms operating in countries with developed financial sectors might not face the pressure of liquidity risk and hence adjust more slowly. Which of these predictions will

prevail in Africa is an empirical matter. We consider variables which measure financial development (i.e., stock market size, stock market liquidity, and size of banking sector) to see the influence of such variables on speed of adjustment.

Sizeable literature documents that macroeconomic conditions explain a substantial amount of cross-country variations in debt maturity decisions (see Demirgüç-Kunt and Maksimovic 1999; Deesomsak et al. 2009, among others). Accordingly, we hypothesize that if macroeconomic conditions affect the optimal debt maturity structure, so might they affect the cost of adjusting to and deviating from the optimal maturity structure. As in the legal institutions, we examine the effect of macroeconomic conditions on the speed of adjustment in two stages. We first examine if there are variation in adjustment speeds across broadly defined income groups (i.e., upper-middle-income; lower middle income, and low income countries) to which the country belongs. Second, we examine the effect of more narrowly defined macroeconomic variables (i.e., taxation, inflation, size of economy, and growth rate of GDP) on adjustment speed.

5.3 The Empirical Framework

Most prior studies on the subject of debt maturity structure use static econometric modelling which imposes an implicit, but unrealistic, assumption that firms are always at their optimal debt maturity level (e.g., Barclay and Smith Jr 1995; Guedes and Opler 1996; Demirgüç-Kunt and Maksimovic 1999; Jun and Jen 2003). In an imperfect environment where there are a set of adjustment costs and benefits, a firm's debt maturity level may not necessarily be at the optimal state. In an effort to properly account for the dynamic nature of debt maturity structure, recent literature adopts a dynamic partial adjustment debt maturity structure models which allow target debt maturity structure to vary across firms and over time (e.g., Schiantarelli and Sembenelli 1999; Antoniou et al. 2006; Cai et al. 2008; Dang 2011;

López-Gracia and Mestre-Barberá 2011; Terra 2011). In this chapter, our prime interest is to examine the pace at which firms adjust their debt maturity structure towards a target. Again, the literature on basic capital structure presents plenty of evidence that adjustment speed estimation is very sensitive to econometric design and poses interesting econometric challenges (e.g., Zhao and Susmel 2008). In line with Flannery and Regan (2006), we adopt the integrated dynamic debt maturity structure model which allows us to jointly determine the adjustment speed along with its determinants⁵⁰.

In line with prior literature, we define the optimal debt maturity structure as a debt maturity level that a firm would desire to have in a frictionless environment. Let the optimal debt maturity structure of firm i in period t , labelled as $DM_{i,t}^*$ be a linear function of a set of N explanatory variables, $K'_{j,i,t}$ (where $j = 1, 2, 3, \dots, N$) that have been used in past cross-sectional studies of debt maturity structure:

$$DM_{i,t}^* = \sum_{j=1}^N \theta'_j K'_{j,i,t} \quad (1)$$

where θ'_j denotes a column vector containing the coefficients of explanatory variables.

Since factors that determine a firm's optimal debt maturity may vary across firms and change over time, it is likely that the optimal debt maturity itself may vary across firms and change over time. Hence, the dynamic set up in Equation (1) allows optimal debt maturity structure to vary across firms and over time.

In a perfect environment where there are no adjustment costs and benefits, observed debt maturity structure ($DM_{i,t}$) is expected to be the same as optimal debt maturity structure ($DM_{i,t}^*$). Hence, in such a setting, the difference between the current and the previous periods' observed maturity levels should be the same as the difference between the optimal and previous period's maturity structures. That is, $DM_{i,t} - DM_{i,t-1}$ should be equal

⁵⁰ For a detailed discussion of the advantages of employing the integrated dynamic panel adjustment model over the two-stage dynamic panel adjustment model see Flannery and Regan (2006) and Cook and Tang (2010).

to $DM_{i,t}^* - DM_{i,t-1}$. However, in an imperfect environment where there are all sorts of adjustment costs and benefits, $DM_{i,t}$ is not necessarily the same as $DM_{i,t}^*$. That is, firms may not fully adjust their debt maturity level to the optimal; they may rather adjust partially. Thus, the equality is disrupted and a more realistic partial adjustment model may be specified as:

$$(DM_{i,t} - DM_{i,t-1}) = \gamma'_{i,t}(DM_{i,t}^* - DM_{i,t-1}) + \varepsilon'_{i,t}, \text{ where } 0 < |\gamma'_{i,t}| < 1 \quad (2)$$

where $\gamma'_{i,t}$ denotes the adjustment parameter representing the magnitude of adjustment towards an optimal maturity structure between two consecutive periods, $DM_{i,t-1}$ represents maturity structure of firm i , in period $t-1$, and $\varepsilon'_{i,t}$ denotes the idiosyncratic error term. Rearranging the terms in Equation (2), we obtain:

$$DM_{i,t} = (1 - \gamma'_{i,t})DM_{i,t-1} + \gamma'_{i,t}(DM_{i,t}^*) + \varepsilon'_{i,t}, \text{ where } 0 < |\gamma'_{i,t}| < 1 \quad (3)$$

The adjustment parameter is computed by subtracting the estimated coefficient of $DM_{i,t-1}$ from 1.

The model follows Terra (2011) and Drobetz and Wanzenried (2006), where firms adjust their debt maturity structure to an endogenously determined debt maturity structure as specified in Equation (1). Following prior empirical work on basic capital structure (e.g., Drobetz and Wanzenried 2006; Flannery and Rangan 2006; Cook and Tang 2010), we specify adjustment speed of maturity structure ($\gamma'_{i,t}$) as a linear function of factors that affect costs and benefits of adjustment ($X'_{i,t}$) and the unobserved firm-specific effects as follows:

$$\gamma'_{i,t} = \omega'_0 + \omega'_1 X'_{i,t} \quad (4)$$

When firm-specific variables are used to explain the speed of adjustment, $X'_{i,t}$ has both time and cross-sectional dimensions. In contrast, in the case of macroeconomic variables, $X'_{i,t}$ has only time dimension as macroeconomic variables do not vary across firms.

Substituting Equation (4) and Equation (1) in Equation (3), we obtain:

$$DM_{i,t} = [1 - (\omega'_0 - \omega'_1 X'_{i,t})] DM_{i,t-1} + (\omega'_0 + \omega'_1 X'_{i,t}) (\sum_{j=1}^N \theta'_j K'_{j,i,t} + \varepsilon'_{i,t}) \quad (5)$$

Partly multiplying Equation (5) out, we obtain:

$$DM_{i,t} = (1 - \omega'_0) DM_{i,t-1} - \omega'_1 X'_{i,t} DM_{i,t-1} + \omega'_0 \sum_{j=1}^N \theta'_j K'_{j,i,t} + \omega'_1 \sum_{j=1}^N \theta'_j K'_{j,i,t} + \varepsilon'_{i,t} \quad (6)$$

When Equation (6) is estimated, interest is mainly in ω'_1 which is the coefficient of the interaction term between the determinant variable of adjustment speed, $X'_{i,t}$, and the lagged debt maturity structure, $DM_{i,t-1}$. We formulate the null hypothesis that $\omega'_1 = 0$, i.e., the speed of adjustment is independent from firm-, industry-, and/or country-characteristics. However, this does not mean that firms do not adjust their debt ratios at all over time; this would only be the case if $(1 - \omega'_1)$ was estimated to be insignificant.

5.4 Results and Discussions⁵¹

5.4.1 Descriptive statistics

It is to be recalled that the thesis, in Chapter 4, had identified two important features that epitomized debt maturity structure of the sample firms during the 10 years period considered in this study. For the sake of convenience, Table 5.1 reproduces the summary statistics which we presented in Table 4.2. We noted that the debt maturity structures of the sample firms were varying during the period under study. We also observed, especially in the latter half of the sample period, that firms in the sample exhibited generally upward trend in their debt maturity structure; debt maturity ratio increased from 19.7 per cent in 2003 to 27.0 per cent in 2008. This phenomenon could be due to the confluence of expansion in the economies and stock markets of our sample countries. It may also be due to the steady increase observed in

⁵¹ The same dataset as in Chapter 4 was used for the analysis in this chapter.

profitability, growth opportunities, firm size, asset maturity and leverage experienced by firms in sample countries. More broadly speaking, these trends might be indicative of rebalancing exercise by the sample firms.

(Insert table 5.1 about here)

In terms of correlational relations, the results presented in Chapter 4 showed that the correlations between firm- and country-level variables and debt maturity structure were consistent with the major debt maturity structure theories. They were also in sync with findings reported in other similar empirical studies. The relatively high correlation that existed between the country-level variables suggests that care must be exercised in modelling debt maturity structure as we could be trapped in multicollinearity problems. Hence, we develop somewhat different specifications of Equation (6) by not including the severely correlated variables in a model.⁵²

As also pointed out in Chapter 3 for basic capital structure, the estimation of the dynamic model in Equation (6) largely depends on an accurate specification of the model for optimal debt maturity structure. A perusal of Tables 4.6, 4.7, 4.8, 4.9 and 4.10 shows that the observed relationship between the firm- and country-level variables and debt maturity structure is generally in line with predictions of mainstream debt maturity structure hypotheses and all the models were fit. The discussions presented in Chapter 4 also showed that our results were consistent with evidence presented in other similar studies. More broadly speaking, our results are comparable with other similar studies and indicate that the independent variables are appropriate to model time varying debt maturity ratios in a dynamic adjustment model.

⁵² The reader is kindly reminded that an extended discussion on the correlation between the firm- and country-level variables and firm's debt maturity structure is available in Chapter 4.

5.4.2 Determinants of adjustment speed of debt maturity structure

In what follows, we present dynamic panel estimation results from Equation (6). We began our analysis by perusing the results for our baseline regression model (Model 1) which specifies debt maturity structure as a function of only firm-specific factors. Table 5.2 presents the system GMM estimate of Model 1.

(Insert table 5.2 about here)

As in Chapter 3, our focus is on the estimates of $(1 - \omega'_1)$ and ω'_1 . While $(1 - \omega'_1)$ shows the movement of debt maturity to its optimal, ω'_1 indicates whether the speed of adjustment is independent of firm- and country-specific characteristics. The estimates of $(1 - \omega'_1)$ was 0.433 which implies that firms in our sample countries close by 56.7 per cent $(1-0.433)$ the gap between current and optimal debt maturity structure within one year. This means a firm takes less than two years to reach its optimal debt maturity structure. Such a rapid adjustment towards an optimal debt maturity structure suggests the existence of dynamic adjustment of the debt maturity structure of firms in our sample to an optimal debt maturity structure.

Our finding supports theories that suggest dynamic trade-off theory and rules out the dominance of signalling theory in firms' debt maturity structure decisions in our sample countries. Hence, it suggests the presence of costly and non-instantaneous adjustment towards the optimal debt maturity structure. This result is broadly consistent with the relatively faster adjustment speeds reported in Deesomsak et al. (2009) for firms in the Asia Pacific region, Ozkan (2000) for firms in the UK, and Antoniou et al. (2006) for firms in France, Germany, and the UK.

5.4.2.1 Firm-specific determinants of adjustment speed of debt maturity structure

We observe from Table 5.2 that the relationship between the distance variable ($\text{Dist}_{i,t}$) and speed of adjustment is negative implying that the further the observed debt maturity ratio from the optimal, the slower the speed of adjustment⁵³. This result supports the notion that larger adjustments required when a firm is further from its optimal debt maturity structure entail engaging in new issues of securities or retiring existing ones unlike smaller adjustments required when a firm is close to its optimal debt maturity which can be achieved through the normal operations of a firm (e.g., Loof 2004). However, this result does not support the liquidity risk hypothesis which conjectures a positive relationship between the two variables.

The size variable which we had suggested as a determinant of adjustment speed has proved to be one of the important variables explaining speed of adjustment in debt maturity structure of firms in our sample. We note that the parameter estimate of the interaction term between firm size and maturity is negative implying that the adjustment speed of larger firms is faster than their smaller counterparts. As discussed earlier, this result support the prediction based on agency hypothesis and contrasts with that posited by liquidity hypothesis.

After controlling for country specific factors (Model 2), we observe that the parameter estimate for the interaction term between growth opportunities and debt maturity structure is negative implying that the adjustment speed of growing firms is faster than no-growth firms. This result is consistent with the increased cost of financial distress that characterizes growing firms.

⁵³ Note that Equation (6) specifies a negative sign on ω_1 , and therefore the signs of the estimated coefficients on the respective interaction terms must be interpreted accordingly.

5.4.2.2 Inter-industry heterogeneity of adjustment speed of debt maturity structure

We examine if the adjustment speeds shown in Table 5.2 persist when we estimate Model 1 on an industry-by-industry basis. System GMM regression estimation results for each industry are reported in Table 5.3 - Panel A⁵⁴.

(Insert table 5.3 about here)

Industry-by-industry comparison of adjustment speeds of the ten industries considered in the study confirms existence of inter-industry variations in adjustment speeds (Table 5.3 - Panel A). We specifically note that firms within the Service industry move towards their target debt maturity structure relatively rapidly, in comparison to those in other industries. The adjustment speed of debt maturity structure for firms in Service industry was 60.04 per cent ($1 - 0.396$) per year. We also observe that firms in this industry generally tend to have relatively high levels of long-term leverage (Table 5.3 - Panel B), which may indicate that they are paying comparatively higher price for capital as cost of debt generally tends to be higher for long-term debts than short-term debts.

One possible interpretation of the above observation is that when firms in this industry deviate from their optimal debt maturity structure, in particular take on additional long-term debt, they may increase their cost of debt even further. Consequently, they may try to adjust back towards their optimal debt maturity structure faster than firms in industries which borrow relatively short-term. Another possible interpretation of this phenomenon is along the lines of what Stoja and Tucker (2007) call “old economy” versus “new economy” taxonomy. According to Stoja and Tucker (2007), industries which fall in the “old economy” category include, *inter alia*, oil and mining, construction, textiles and real estate whereas those in the “new economy” group include biotechnology, IT and leisure. As firms in the “old

⁵⁴ For reasons of brevity, we report only coefficients of lagged debt maturity ratio along with the corresponding robust standard errors and number of observations.

economy” tend to be fixed asset intensive while those in “new economy” group tend to be R&D intensive, Stoja and Tucker (2007) argue that the cost of deviating from the optimum may be higher in the “new economy” industries than “old economy” industries. The fact that we observe faster adjustment speed for firms in Service industry is also consistent with Stoja and Tucker’s argument.

In contrast, firms within the Durable and Oil and Gas industries adjust their debt maturity structure relatively slowly towards their optimum (Table 5.3 - Panel A). The adjustment speeds of debt maturity structure for firms in these industries is 4.6 per cent ($1 - 0.954$) and 25.4 per cent ($1 - 0.746$) per year, respectively. We also note that firms in these industries tend to have a generally low short-term leverage (Table 5.3 - Panel B), which may indicate that firms in these industries might be experiencing lesser pressure of liquidity risk. According to Flannery and Hankins (2007), firms which are in a less distressful situation have a different incentive to adjust than those in more distressful situations. Hence, when firms in these industries deviate from their optimal debt maturity structure, they may feel less pressure to adjust back to the optimal quickly. This finding is also consistent with Stoja and Tucker’s (2007) “old economy” versus “new economy” taxonomy as both Durable and Oil & Gas industries fall within what they call “old economy” industries.

5.4.2.3 Cross-country heterogeneity of adjustment speed of debt maturity structure

For the purpose of evaluating cross-country variation in adjustment speeds, we estimate Model 1 using system GMM for each of the countries included in our sample. We report only coefficients of lagged debt maturity ratios and robust standard errors in Table 5.4.

(Insert table 5.4 about here)

Our results show that firms in Nigeria adjust at the fastest rate ($1 - 0.493 = 0.507$) while those in Morocco adjust at the slowest rate ($1 - 0.872 = 0.128$). Overall, as in the inter-

industry analysis, a comparison of country-by-country results (Table 5.4) for seven countries indicate that there is a cross-country variation in adjustment speeds of debt maturity structures of firms in our sample⁵⁵. These cross-country variations in adjustment speeds suggest that certain country-level variables might explain debt maturity dynamics beyond those explained by firm- and industry-specific characteristics.

Based on our earlier hypothesis that legal institutions should determine the adjustment speed of debt maturity structure, we examine adjustment speeds by splitting our sample into firms from countries with common law and civil law traditions. Table 5.5 reports system GMM estimates of adjustment speeds of firms in each sub-sample. We report only coefficients of lagged debt maturity ratios.

(Insert table 5.5 about here)

Based on the law-and-finance literature, we expect that adjustment costs should be lower (and/or adjustment benefits should be higher) for firms operating in legal systems based on English common law compared to those operating in legal system based on French civil law. In line with this expectation, we observe that firms operating in countries with legal systems based on the English common law adjust to optimal debt maturity structures at a relatively faster speed – 69.7 per cent – than those operating in countries with legal systems based on the French civil law – 51.5 per cent (Table 5.5). This observation corroborates the hypothesis that legal institutions influence the adjustment costs and/or benefits, and hence, the adjustment speed of debt maturity structure of firms.

Table 5.6 presents system-GMM estimation results for debt maturity structure adjustment speeds and its determinants by splitting the sample into sub-samples of income groups. Consistent with our expectation that the level of development has influence on debt maturity structure adjustment speed, our results show that adjustment speeds vary across

⁵⁵ The results for Botswana and Ghana were not reported owing to sample size limitations.

income groups. Specifically, we observe that firms in lower-middle-income countries tend to have a faster adjustment speed than their counterparts in upper-middle and low-income countries.

(Insert table 5.6 about here)

These differences in speeds of adjustment are consistent with the view that the relative costs and/or benefits of deviating from optimum debt maturity structure varies across income levels. Hence, the (net) adjustment cost, based on Table 5.6, is highest for lower-middle-income countries, followed by upper-middle- and low-income countries. We couldn't however see a clear positive (or negative) association between income level of a country and the adjustment speed of a firm's debt maturity structure. The relationship is rather a complex one. A clearer picture could be seen when we examine the role of more narrowly defined set of macroeconomic variables (Model 2) on adjustment speed of debt maturity structure.

The results of analysis of the influence of a set of more specific legal (i.e., creditor and shareholder rights protection and rule of law), financial (i.e., stock market size, stock market liquidity, and size of banking sector), and macroeconomic (i.e., overall economy, growth rate of the economy, corporate tax rate, and inflation) variables on adjustment speed of debt maturity structure is reported in Table 5.7. As alluded to earlier in this chapter and also in Chapter 3, we develop variants of Model 2 (i.e., Model 2a, Model 2b, . . . , Model 2g) each of which encompass only less correlated independent variables. Table 5.7 presents the parameter estimates and related test statistic using system GMM.

(Insert table 5.7 about here)

We observe that the parameter estimates for the interaction between all the variables defining legal institutions (i.e., shareholder and creditor rights protection and the rule of law) and debt maturity ratio are negative implying the adjustment speed of debt maturity of firms

in countries with stronger investor protection and law enforcement is faster than of those in weaker investor protection and law enforcement. This is consistent with the view that firms in countries with legal systems which provide better investor protection and law enforcement should more quickly adjust their debt maturity structure to the optimal than those in countries which provide weaker investor protection and law enforcement.

Our results also show that the parameter estimates for the interaction term between overall size of economy and its growth rate and debt maturity ratio are negative implying that adjustment speed of debt maturity of firms in richer and fast-growth countries is faster than of those in poorer and slow-growth economies. Our interpretation of this result is that the financial flexibility that firms in richer and fast growing economies enjoy due to the more developed financial markets that exist in these countries (see Table 4.5) permits such firms to adjust their debt maturity structure more quickly than their counterparts in poorer and slow-growth economies.

5.5 Conclusions

This chapter extended the debate on debt maturity structure by disentangling matters pertaining to adjustment of debt maturity structure of a firm within the context of African countries. We argued that debt maturity structure of firms in Africa displays target behaviour and the pace at which they adjust their debt maturity structure to a target is a function of not only firm characteristics but also of industry, institutional and macroeconomic factors. We examined the data using system-GMM panel data estimator which is robust to firm heterogeneity and data endogeneity problems.

The chapter presented ample evidence that firms in our sample not only adjust their debt maturity structure toward a target but also that they experience varying degrees of costs and/or benefits of adjustment. This implies, as in basic capital structure, that hypotheses

grouped under dynamic trade-off theory explain debt maturity structure and that signalling hypothesis is not the dominant theory that explains debt maturity structure of sample firms.

The chapter also presented evidence that the extent of adjustment costs and/benefits of firms in our sample is inversely related to firm size, growth opportunities and the distance between observed and target debt maturity structure. This signifies the role that agency, transaction, and financial distress costs play in aggravating or mitigating adjustment costs and/or benefits.

At industry level, the thesis documents that firms within the Service industry move towards their target debt maturity structure relatively rapidly than is the case in other industries. In contrast, firms within the Durable and Oil & Gas industries adjust their debt maturity structure relatively slowly towards their optimum. The chapter also remarks that those firms in the Service industry do generally tend to have relatively high levels of long-term leverage whilst those in Durable and Oil & Gas tend to have lower levels of short-term leverage. These observations suggest that liquidity pressure, cost of debt, and agency costs are at the centre of the determination of costs and/or benefits of adjustment.

In line with our expectation, the chapter documents that firms in common law countries adjust more rapidly to the optimal debt maturity structure compared to those in civil law countries. We also document that firms in countries with stronger shareholder and creditor rights protection and efficient law enforcement tend to adjust their debt maturity structure more speedily than those in countries with weaker shareholder and creditor rights protection and poorer law enforcement. These evidences highlight the importance of agency costs related with the protection of investors and law enforcement in aggravating or mitigating costs and/or benefits of adjustment speed.

The chapter also proffers evidence that the overall size of a country's economy and its growth rate have positive influence on the adjustment speed of a firm's debt maturity

structure. This signifies the importance of financial flexibility that firms in richer and fast growing economies enjoy due to the more developed financial markets that exist in these countries.

In summary, the study presented in this chapter was an attempt to push the frontiers of debate on firms' debt maturity structure decisions one step further by examining the role that firm-, industry- and country-level factors play in the determination of the rate at which firms operating in Africa adjust their debt maturity structure toward a target. The final chapter that follows aims to conclude the study. It summarizes the study, outlines major findings presented in the hitherto chapters, draws main conclusions of the study, and discusses implications of results.

Table 5.1: Evaluation of firm and country characteristics

Panel A: Descriptive statistics of firm characteristics										
Year	Debt Maturity	Distance - Maturity	Firm Size	Earnings Volatility	Profitability	Growth Opportunities	Asset Maturity	Dividend Payout	Tax shield	
1999	0.243	-	5.221	0.244	0.274	0.024	9.815	0.293	0.031	
2000	0.236	0.008	5.108	0.270	0.059	0.034	7.153	0.634	0.030	
2001	0.258	0.016	5.150	0.274	0.124	0.058	11.870	0.553	0.038	
2002	0.214	0.026	4.968	0.216	0.086	0.029	18.121	0.675	0.036	
2003	0.197	0.031	4.961	0.235	0.094	0.056	16.793	0.687	0.036	
2004	0.201	0.031	4.973	0.219	0.106	0.053	12.167	0.632	0.034	
2005	0.218	0.032	5.067	0.234	0.118	0.035	14.204	0.584	0.033	
2006	0.223	0.036	5.170	0.208	0.114	0.078	10.002	0.601	0.031	
2007	0.250	0.039	5.321	0.225	0.130	0.086	8.288	0.614	0.031	
2008	0.270	0.037	5.417	0.209	0.122	0.075	14.322	0.613	0.033	
Overall	0.225	0.028	5.116	0.224	0.112	0.059	12.970	0.619	0.034	

Panel B: Descriptive statistics of institutional and macroeconomics characteristics										
Year	Taxation	Inflation	Size of Economy	Growth of Economy	Size of Stock Market	Liquidity of Stock Market	Size of Banking Sector	Creditor Rights	Shareholder Rights	Rule of Law
1999	35.108	4.098	3.188	2.332	73.484	26.960	0.660	2.384	3.550	.
2000	34.985	4.213	3.199	2.621	58.206	28.824	0.657	2.384	3.550	-0.077
2001	34.985	4.821	3.206	1.677	46.577	18.948	0.691	2.384	3.550	.
2002	34.985	5.363	3.210	1.034	61.606	30.713	0.702	2.384	3.550	-0.102
2003	34.863	5.797	3.220	2.206	62.971	20.428	0.699	2.384	3.550	-0.125
2004	34.863	8.252	3.233	3.202	85.285	23.278	0.705	2.384	3.550	-0.036
2005	34.863	5.530	3.246	2.980	112.525	35.167	0.709	2.384	3.550	-0.030
2006	34.531	7.001	3.266	4.609	125.792	44.854	0.691	2.384	3.550	-0.099
2007	23.404	8.021	3.285	4.592	144.504	42.829	0.679	2.384	3.550	-0.119
2008	23.404	NA	NA	NA	NA	51.166	.	2.384	3.550	-0.100
Overall	32.599	5.899	3.228	2.806	85.661	32.317	0.688	2.384	3.550	-0.086

Notes: Dist-Maturity refers to the difference between the observed debt maturity structure and the fitted value from a fixed effects (two way error component) regression of the debt maturity structure on the seven maturity structure determinants. The definition of all the other variables is as presented in Table 2.3 in chapter 2.

Table 5.2: Firm-specific Factors and Debt Maturity Adjustment Speed – Model 1

Dependent Variable	Debt Maturity
Matur _{i,t-1}	0.433 *** (0.096)
Matur _{i,t-1} x Size _{i,t}	-0.100 * (0.059)
Matur _{i,t-1} x Profit _{i,t}	0.304 (0.946)
Matur _{i,t-1} x Grwth _{i,t}	-0.617 (0.530)
Matur _{i,t-1} x Dist _{i,t}	4.433 *** (0.931)
Constant	0.050 (0.053)
Wald Test	172.83 (6)
Z ₂	1.148
Sargan Test	95.649 (107)
N	992

Notes: The table reports the results for the whole sample of estimating Equation (6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. The table shows the coefficients on the lagged maturity ratio and on the interaction term of the determinant of adjustment speed with the lagged maturity ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target maturity ratio are jointly equal to zero. The test statistic Z₂ tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator. In parenthesis are the chi-squares. The exact definition of the variables is as presented in Table 2.3 of chapter 2.

Table 5.3 Debt maturity structure and its adjustment speed by industry**Panel A: Inter-industry Heterogeneity in Adjustment Speeds**

Dependent Variable	Debt Maturity
Non-durable Industry	0.790 *** (0.105) 205
Durable Industry	0.954 *** (0.274) 28
Manufacturing Industry	0.633 *** (0.164) 188
Oil and Gas Industry	0.746 *** (0.142) 45
Chemicals & Construction Industry	0.643 *** (0.134) 117
Business Equipment Industry	0.178 (1.541) 38
Regulated Industry	0.229 (0.418) 76
Wholesale & Retail Industry	0.760 (0.801) 109
Health Industry	0.524 (10.164) 83
Service Industry	0.396 *** (0.080) 125

Notes: The table reports the parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each industry in the sample. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations. The exact definition of the variables is as presented in Table 2.3 of chapter 2.

Panel B: Summary statistics of measures of capital structure by industry

	Short-term leverage			Long-term leverage			Total leverage		
	Mean	SD*	Obs#	Mean	SD*	Obs#	Mean	SD*	Obs#
Non-durables	0.345	0.209	1006	0.109	0.159	1055	0.467	0.288	1011
Durables	0.342	0.178	167	0.088	0.115	170	0.432	0.212	167
Manufacturing	0.357	0.194	921	0.124	0.176	958	0.482	0.245	922
Oil & Gas	0.265	0.233	385	0.197	0.206	383	0.477	0.321	386
Chem. & Construction	0.445	0.224	523	0.108	0.164	536	0.555	0.230	523
Business Equipment	0.429	0.243	346	0.078	0.105	350	0.526	0.316	346
Regulated	0.367	0.200	304	0.182	0.194	310	0.546	0.226	305
Wholesale & Retail	0.428	0.229	697	0.095	0.119	748	0.545	0.309	705
Health	0.352	0.189	283	0.074	0.138	294	0.435	0.232	283
Service & Others	0.318	0.226	814	0.132	0.160	862	0.462	0.293	814

* SD = standard deviation; # Obs = number of observations.

Table 5.4: Cross-country Heterogeneity in Adjustment Speed

Dependent Variable	Debt Maturity
Egypt	0.506 *** (0.096) 718
South Africa	0.459 (3.531) 79
Kenya	0.116 (0.805) 37
Mauritius	-0.177 (1.100) 19
Morocco	0.872 *** (0.119) 64
Nigeria	0.493 * (0.325) 44
Tunisia	0.175 (0.282) 38

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each country in the sample. The results for Botswana and Ghana were not included owing to sample size issues. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 5.5: Heterogeneity in Adjustment Speeds across Legal Origin

Dependent Variable	Debt Maturity
Common Law	0.303 *** (0.111) 175
French Law	0.485 *** (0.099) 839

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each legal family. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 5.6: Heterogeneity in Adjustment Speeds across Income Groups

Dependent Variable	Debt Maturity
Upper middle income countries	0.412 (5.257) 107
Lower middle income countries	0.487 *** (0.098) 820
Low income countries	0.270 (0.486) 87

Notes: The table reports parameter estimates of the one-period lagged dependent variable and the corresponding robust standard errors and number of observations. Equation (6) was estimated using system GMM estimator proposed by Blundell and Bond (1998) for each income group family. For reasons of brevity, we do not report parameter estimates and related details of firm-specific variables included in the model. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. And the figure in a third row is the number of observations.

Table 5.7: Determinants of adjustment speed of debt maturity structure - Model 2

Dependent Variable: Debt Maturity	Model 2 (a)	Model 2 (b)	Model 2 (c)	Model 2 (d)	Model 2 (e)	Model 2 (f)	Model 2 (g)
LV _{i,t-1}	0.442 *** (0.130)	0.444 *** (0.101)	0.452 *** (0.106)	0.440 *** (0.117)	0.477 *** (0.128)	0.467 *** (0.114)	0.477 *** (0.109)
LV _{i,t-1} x Profit _{i,t}	-0.163 (1.065)	0.193 (0.965)	-0.655 (1.195)	0.061 (1.832)	-0.276 (0.934)	-0.125 (1.135)	-0.351 (0.974)
LV _{i,t-1} x Grwth _{i,t}	-0.267 * (0.772)	-0.872 (0.624)	-1.223 * (0.775)	-0.971 (0.748)	-1.034* (0.602)	-1.182 * (0.738)	-1.145 * (0.622)
LV _{i,t-1} x Dist _{i,t}	3.264 *** (0.937)	3.854 *** (0.884)	3.474 *** (0.939)	4.016 *** (1.063)	4.573 *** (1.082)	3.580 *** (1.110)	4.135 *** (0.900)
LV _{i,t-1} x GDGP _{i,t}	-0.045 * (0.024)						
LV _{i,t-1} x SR _{i,t}							-0.103 * (0.164)
LV _{i,t-1} x RUL _{i,t}	-0.493 * (0.264)				0.043 (0.266)		-0.093 (0.251)
LV _{i,t-1} x TAX _{i,t}		-0.003 (0.004)					
LV _{i,t-1} x STKLIQ _{i,t}						-0.281 (0.244)	
LV _{i,t-1} x INFL _{i,t}			-0.003 (0.014)			-0.001 (0.013)	
LV _{i,t-1} x STKSIZ _{i,t}			-0.051 (0.102)				
LV _{i,t-1} x BNKSIZ _{i,t}				-0.341 (0.778)			
LV _{i,t-1} x CR _{i,t}				-0.064 * (0.123)			
LV _{i,t-1} x LOGGDP _{i,t}					-0.222* (0.138)		
Constant	0.024 (0.035)	-0.003 (0.036)	0.022 (0.037)	0.041 (0.143)	0.078 (0.069)	0.002 (0.040)	0.030 (0.093)
Wald Test	84.18 *** (6)	198.61 (6)	96.96 *** (6)	91.49 *** (6)	98.01 *** (7)	106.43 *** (7)	169.06 *** (7)
Z ₂	-1.137	-1.528	-1.254	-1.351	-1.448	-1.243	
Sargan Test	78.938 (93)	104.169 (109)	85.961 (99)	90.229 (99)	84.140 (93)	83.285 (98)	107.996 (116)
N	818	992	826	824	797	805	984

Notes: The table reports the results of estimating Equation (6) using system GMM estimator proposed by Blundell and Bond (1998). Variations in sample size are due to data limitations. Dist_{i,t} is constructed as the fitted values from a fixed effects (two way error component) regression of the debt maturity ratio on the eight debt maturity structure determinants. The exact definitions of all the other variables are presented in Annex A. The table shows the coefficients on the lagged maturity ratio and on the interaction term of the determinant of adjustment speed with the lagged debt maturity ratio. Coefficients significantly different from zero at 1%, 5%, and 10% level are marked ***, **, and *, respectively. Robust standard errors are in brackets. The Wald test statistic refers to the null hypothesis that all coefficients on the determinants of target maturity ratio are jointly equal to zero. The test statistic Z₂ tests the null hypothesis of no second order correlation in the residuals. The Sargan test statistic refers to the null hypothesis that the overidentifying restrictions are valid and uses the Blundell and Bond (1998) system GMM estimator.

CHAPTER 6

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

6.1 Introduction

The extant literature has travelled a long way in terms of advancing our understanding of the financing decisions of a firm over the last five decades. It has moved from the initial “irrelevance” proposition forwarded by MM (1958) to a host of competing theories favouring the “relevance” of financing decisions to firm value. However, neither the theoretical nor the empirical endeavours could reach at a consensus even on the basic issues surrounding firm finance (e.g., Elsas and Florysiak 2008). After roughly three decades since Myers’ (1984) presidential address to the American Finance Association, the literature is far from providing an exact answer to the question: how do firms decide on their capital structure and, by extension, their debt maturity structure?

Despite the lack of consensus, the finance literature has made considerable inroads towards enhancing our understanding of financing decisions of a firm. Two important “stylized facts” are noticeable in the hitherto literature. First, there is a substantial dynamic component in the determination of both basic capital structure as well as debt maturity structure of a firm (see Antoniou et al. 2006; Flannery and Rangan 2006; Antoniou et al. 2008; Dang 2011; Deesomsak et al. 2009; Terra 2011, among others). Second, a firm’s financing decisions are a function of not only firm-specific factors but also of industry, macroeconomic, and institutional factors (see Rajan and Zingales 1995; Demircuc-Kunt and Maksimovic 1996; De Jong et al. 2008, among others).

In spite of the recognition that firm-, industry- and country-level characteristics are important factors in understanding a firm’s financing decisions, the extant empirical literature

has several shortcomings. Most prior empirical works⁵⁶ are either single-country studies or, if they involve cross-country setup, focus on advanced or non-African economies. This drawback is even more acute when it comes to studies on debt maturity structure. We, however, know that not only country-level factors such as legal and financial institutions and macroeconomic conditions are important determinants of financing decisions of a firm but also that these factors in Africa are different from those in the advanced world. Further, notwithstanding the recognition in the recent literature that there is a substantial dynamic component in a firm's financing decisions and that the dynamism is a function of firm-, industry- and country-level variables, the subject is virtually unstudied within the African milieu.

In trying to fill this gap, this thesis has:

- examined basic capital structure of firms in selected African countries to identify the influence of firm- industry-, institutional-, and macroeconomic-factors on a firm's basic capital structure decisions;
- investigated debt maturity structure of firms in selected African countries to identify the effect of firm-, industry-, institutional-, and macroeconomic -factors on a firm's debt maturity structure decisions;
- assessed the role of institutional-, macroeconomic-, industry-, and firm-characteristics on the adjustment speed of basic capital structure within the context of selected African countries; and
- examined the role of institutional-, macroeconomic-, industry-, and firm-characteristics on the adjustment speed of corporate debt maturity structure within the context of selected African countries.

⁵⁶ The notable exceptions to the disturbing dearth of cross-country studies in the context of African countries were the recent works by Gwatidzo and Ojah (2009) and Gwatidzo (2009:149-222). The reader is kindly referred to Chapter 1 for a brief critique on these works.

To address the above closely intertwined issues in corporate finance, the study examined 10-year (between 1999 and 2008) financial statement data related to 986 non-financial firms drawn from nine African countries including Botswana, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, South Africa and Tunisia. The financial statement data were used to capture “conventional” firm-characteristics that were known to effect on financing decisions of a firm. We classified firms into 10 industries using the US SIC (4-digit) following Song and Philippatos (2004). Publications by the World Bank, Berkowitz et al. (2003), Kaufmann et al. (2009), and Andrei Shelifer’s personal web page were used to obtain data on institutional and macroeconomic variables. These data were subjected to a series of econometric models. The analyses were done primarily within the panel data framework in which various types of panel data estimation techniques ranging from simple pooled OLS to system-GMM were carried out. The following sections present a summary of the main findings, the policy implications of the findings and directions for future research.

6.2 Summary of Findings

6.2.1 Determinants of basic capital structure of a firm

Based on mainstream capital structure theory, the thesis argued that basic capital structure of a firm is a function of not only firm characteristics but also of industry, institutional and macroeconomic characteristics. We interrogated the data by employing a sequence of models to show the role of different factors and checked robustness of results through [all] available econometric procedures. The study documents a number of findings from the analyses.

Differences in basic capital structure of firms attributable to firm-specific characteristics were observed. Leverage, for all the three measures used, tends to be higher in larger firms whilst it is likely to be lower in smaller firms. Also, asset tangibility is observed

to have a positive influence on long-term leverage while it has an inverse influence on short-term leverage. As we alluded to in Chapter 2, the literature usually considers firm size and asset tangibility as proxies for probability of default, adverse selection, and agency costs. Hence, our confirmations imply that firms in our sample consider probability of default, adverse selection and agency costs as important factors in the determination of its basic capital structure. On the other hand, the evidence that more profitable firms tend to have less leverage while less profitable firms tend to have more leverage signifies the role that transaction costs and information asymmetry problems play in the determination of basic capital structure of firms in our sample. Furthermore, the study establishes that non-debt-related tax-shield is positively related to long-term leverage while [it] is negatively related short-term leverage. This evidence partially corroborates the argument that the higher the non-debt-related tax-shields such as depreciation, net operating loss carry forwards and tax credits, the lower the tax advantage that arises from interest deduction. Finally, we showed that the dividend payout variable negatively influences long-term leverage. Dividend policy is conjectured to reflect a firm's need (or lack of it) for additional financing or information asymmetry and agency problems faced by the firm. Hence, this finding proffers further evidence that firms in our sample consider agency costs and information asymmetry issues in basic capital structure decisions.

The industry in which a firm operates also seems to have an influence on the basic capital structure decisions of a firm. We observe that the inter-industry differences appear to be a function of how capital structure is defined. We particularly note that short-term and total leverage of firms in the Wholesale and Retail and Chemical and Construction industries are significantly higher than those of firms in the Manufacturing industry. On the other hand, long-term leverage of firms in Regulated industries tend to be higher than those of firms in the Manufacturing industries. The literature generally suggests that inter-industry differences

in capital structure are related to differences in operating characteristics (including the nature of assets and technologies used) and industry specific regulations. As such, our evidence signifies the important role that industry specific technologies and regulations play in firm's capital structure decisions.

In terms of macroeconomic conditions, we observe that firms in richer countries tend to have more long-term and less short-term leverage than is the case in poorer countries. In contrast, the rate of economic growth is indirectly related with long-term and total leverage. Also, a firm in our sample is likely to issue more debt under inflationary environment. In addition to direct influences, we observe that the negative influence of profitability on short-term leverage is stronger in lower-middle-income countries than is the case in other income group countries. Similarly, the positive influence of dividend payout ratio on long-term and total leverage is stronger in low-income countries than is the case in the other two groups. As noted in Chapter 2, the level of the overall economy and its growth rate are usually considered in the literature as proxies for access to finance, firm's investment opportunity set and financing needs, probability of bankruptcy, agency costs and market timing. Similarly, inflation reflects government's ability to manage its country's economy. Thus, the evidence summarized in the above paragraph signifies the role the above factors play in basic capital structure of decision of firms in our sample countries.

At institutional level, our findings indicated that there is: (i) a direct relationship between investor (both shareholders and creditors) rights protection and a firm's leverage; (ii) an inverse relationship between the rule of law variable, size of banking sector and leverage; and (iii) a "definitionally-sensitive" relationship between development of stock markets and leverage. These evidences suggest that agency and contract enforcement costs are among the consideration in basic capital structure decisions of firms in the sample.

6.2.2 Capital structure adjustment speed and its determinants

In the second part of the thesis, we further extended the debate on basic capital structure decisions of firms in Africa along the lines of empirical endeavours elsewhere. We contended that capital structure of firms in Africa displays target behaviour and the pace at which they adjust their capital structure to a target is a function of not only firm characteristics but also of industrial, institutional and macroeconomic factors. We examine the data using system-GMM panel data estimator which is robust to firm heterogeneity and data endogeneity problems.

The thesis presents evidence that capital structure of firms in Africa not only converges to a target but also that it faces varying degrees of adjustment costs and/or benefits in doing so. This suggests not only that dynamic trade-off theory explains capital structure decisions of firms in our sample but also rules out the dominance of information asymmetry based theories within the context of firms in Africa.

Also, the thesis established that the extent of costs and/or benefits of adjustment that firms in Africa face is determined, *inter alia*, by firm-specific factors such as firm profitability, size, growth opportunities, and the gap between observed and target capital structure. Furthermore, except for firm profitability which positively influences adjustment speed, we observe that the nature of influence that firm-specific characteristics exert on adjustment costs and/or benefits is a function of how leverage is defined. As could be noted from the discussions in Chapter 3, the adjustment speed literature customarily considers the above firm-specific characteristics as proxies for financing costs, financial flexibility, access to finance, the potential cost of distress and value of debt-related tax-shield. As such, the role that firm-specific characteristics play in the determination of adjustment speed suggests that the above issues are at play in aggravating or mitigating adjustment costs and/or benefits.

In terms of inter-industry differences in adjustment costs and/or benefits, we note that the relationships are sensitive to how one defines capital structure. On a short-term leverage basis, firms within the Durables and Chemicals & Construction industries move towards their target capital structures relatively rapidly than is the case in other industries. In contrast, on a long-term leverage basis, firms within the Health, Oil & Gas, and Regulated industries move towards their target capital structures relatively rapidly than is the case in other industries. A further investigation shows that firms in riskier industries were observed to adjust faster than those in less risky ones implying that probability of bankruptcy has important place in determining adjustment costs and/or benefits of a firm in our sample countries.

In addition, consistent with the view that adjustment costs should be lower and /or adjustment benefits should be higher in common law origin countries; we observe that firms in countries with common law tradition tend to more rapidly adjust their capital structure than is the case in countries with civil law system. In terms of more-narrowly-defined institutional variables, we observe that shareholder rights protection and rule of law, in contrast to creditor rights protection, have positive influence on capital structure adjustment speed of firms. The implication of these findings is that investor protection and contract enforceability are important matters in the determination of adjustment costs and/or benefits of firms in our sample.

The thesis also proffers evidence that more developed banking sector and stock markets negatively influence speed of adjustment of short-term and total leverage. Contrary to our expectation, adjustment speeds of short-term and long-term leverages are slower in richer countries than is the case in poorer countries. Furthermore, firms in countries which have higher marginal corporate tax rate and inflation tend to have faster adjustment speed. Put together, the evidences again suggest that access to external finance and tax issues are central to the determination of adjustment costs and/or benefits of firms in our sample.

6.2.3 Determinants of debt maturity structure of a firm

The third part of the thesis went beyond issues pertinent to basic capital structure and, to a certain extent, tackled matters pertaining to debt maturity structure. We contended that debt maturity structure of firms in our sample is determined by a host of “conventional” factors including firm, industrial, institutional and macroeconomic characteristics. The data was examined using a battery of models to identify the significance of different factors. A range of standard estimation procedures were used for checking the robustness of results.

At firm level, we observe that such factors as earnings volatility, asset maturity and leverage have positive influences on the debt maturity structure of firms in our sample. This implies that liquidity risk pressure, maturity matching and bankruptcy risk are important factors in debt maturity structure decisions of firms in our sample. On the other hand, we also document that firm profitability and dividend payout ratio inversely influence debt maturity decisions of our sample firms which signifies the signalling role of debt maturity structure.

We also note inter-industry heterogeneity in debt maturity structure of firms in our sample. Specifically, firms in Oil & Gas, Regulated and Service industries incline to have longer debt maturities while those in Durables, Chemical and Construction, Business Equipment, Wholesale and Retail and Health industries incline to have shorter debt maturity. This implies that industry characteristics such as industry-specific technologies, risks, and regulations influence debt maturity decisions of firms in our sample countries.

In terms of macroeconomic variables, the thesis establishes that firms in low-income countries tend to issue less long-term debt relative to those in upper-middle-income countries. This was further cemented by our observation that the size of overall economy and debt maturity structure were positively related. Contrary to our expectation, the thesis also documents that growth rate of real GDP per capita variable is negatively related with debt maturity structure. This, perhaps, is due to the prevalence of relatively shorter asset maturities

that epitomize firms in high-growth countries. Also, we found that the influence of taxation variable on debt maturity structure is negative as expected. Chapter 4 notes that the above economy-wide factors are usually taken as proxies for quality of law enforcement, access to external finance, maturity matching, agency problems and debt-related tax shields. Thus, the findings in the thesis underscore the importance of the above issues in debt maturity structure decisions of firms in our sample.

We also note that financial deepening had a role to play in the debt maturity structure decisions of firms in our sample. Unlike, stock market development variables, banking sector development variables were negatively related with debt maturity structure of our sample. With regard to legal institutions, we found that the provisions of the law with regard to investor protection influences debt maturity structure of firms directly and highly significantly. Although the positive relationship between shareholders rights protection variable and debt maturity corroborates conjectures based on agency theory, the similar relationship that we observe between creditor rights protection and debt maturity contradicts hypothesis based on the same theory. The latter relationship could be due to the relatively small banking sector that characterized countries with high creditor rights protection index (i.e., Botswana, Nigeria, and Kenya) in our sample. Put together, the evidences suggest that agency and bankruptcy costs and information asymmetry problems do matter in the determination of debt maturity structure of firms in our sample.

In addition to the direct effects, we observe that broadly defined macroeconomic and institutional variables had an indirect effect by either mitigating or enhancing the influence of firm-specific factors. For instance, in lower-middle-income countries, the effect of profitability is enhanced whilst that of asset maturity and dividend payout is mitigated. Furthermore, in low-income countries, while the influence of asset maturity is enhanced that of non-debt-related tax-shield is deterred. Similarly, in common law countries, the effect of

profitability on debt maturity structure is enhanced while the effect of asset maturity is mitigated. The fact that we observe some commonality between the determinants of basic capital structure and debt maturity reinforces the view that the two financing decisions are highly intertwined and, perhaps, jointly determined.

6.2.4 Debt maturity adjustment speed and its determinants

Lastly, the study extended the debate on debt maturity structure by disentangling matters pertaining to adjustment of debt maturity structure of a firm within the context of African countries. We argued that debt maturity structure of firms in Africa displays target behaviour and the pace at which it adjusts to a target is a function of not only firm characteristics but also of industrial, institutional and macroeconomic factors. We examine the data using system-GMM panel data estimator which is robust to firm heterogeneity and data endogeneity problems.

The study proffers ample evidence that firms in our sample countries not only adjust their debt maturity structure toward a target but also that they experience varying degrees of costs and/or benefits of adjustment. This implies, as in basic capital structure, that hypotheses grouped under trade-off theory explain debt maturity structure and that signalling hypothesis is not the dominant theory that explains debt maturity structure of sample firms.

The study also presents evidence that the extent of adjustment costs and/benefits of firms in our sample is inversely related to firm size, growth opportunities and the distance between observed and target debt maturity structure. This signifies the role that agency, transaction, and financial distress costs play in aggravating or mitigating adjustment costs and/or benefits.

At industry level, the thesis documents that firms within the Service industry move towards their target debt maturity structure relatively rapidly than is the case in other

industries. In contrast, firms within the Durable and Oil & Gas industries adjust their debt maturity structure relatively slowly towards their optimum. The thesis also remarks that firms in the Service industry tend to have relatively high levels of long-term leverage whilst those in Durable and Oil & Gas tend to have lower levels of short-term leverage. These observations suggest that liquidity pressure, cost of debt, and agency costs are at the centre of the determination of costs and/or benefits of adjustment.

In line with our expectation, the study documents that firms in common law countries adjust more rapidly to the optimal debt maturity structure compared to those in civil law countries. We also document that firms in countries with stronger shareholder and creditor rights protection and efficient law enforcement tend to adjust their debt maturity structure more speedily than those in countries with weaker shareholder and creditor rights protection and weaker law enforcement. These evidences highlight the importance of agency costs related to protection of investors and law enforcement in aggravating or mitigating costs and/or benefits of adjustment speed.

The study also proffers evidence that the overall size of a country's economy and its growth rate have positive influence on the adjustment speed of firm's debt maturity structure. This signifies the importance of financial flexibility that firms in richer and fast growing economies enjoy due to the more developed financial markets that exist in these countries.

6.3 Policy Implications of the Findings

Several useful policy implications emerge from the study. Firstly, the prevalent agency and information asymmetry problems that we identified, virtually in all of the analyses, means that there is a need for governments, policymakers and other stakeholders in the sample countries to institute mechanisms to mitigate these problems. The “law-and-finance” literature examined in the present study documents that legal institutions could be

used to minimize agency conflicts that in turn, affect various issues in finance. Specifically, the law and the quality of its enforcement are important determinants of the extent to which firms are willing to borrow, creditors are willing to lend or shareholders are willing to invest. The literature also suggests that one of the important functions of financial markets is that they facilitate information acquisition and the more developed the financial markets of a country are the more convenient and cheaper it gets for participants in the markets to acquire information and investors that have better information about firms can make better investment decisions. Thus, by considering legislations, policies and directives that enhance protection of investor's rights, policymakers, governments and other stakeholders would be able to enhance the development of financial markets and also mitigate both the agency and information asymmetry problems.

Secondly, the inadequacy of access to external finances observed in our sample signifies the need for establishing policies that enhance financial deepening in sample countries since financial deepening reduces financing constraints. As alluded to in the above paragraph, one way to enhance financial deepening is through the promulgation of legislations, policies and directives conducive for the development of financial markets. The literature also suggests that macroeconomic policies such as interest rate restraints and reserve and liquidity requirements may as well be used to enhance financial deepening (see Levine 1999; Beck, Demirguc-Kunt and Levine 2005, among others).

Finally, we observe clear evidence that there are inter-industry differences in basic capital and debt maturity structure and also the corresponding adjustment speeds. Therefore, although it is worthwhile for governments, policymakers and other stakeholders to attempt to solve the problems we alluded to above, it is crucial that these policy interventions be crafted with great care. That is, a "one size fits all" type of policy intervention may not be effective for all the industries in a country.

6.4 Limitations of the Study

Notwithstanding the contributions that this study attempts to make, some circumspection is essential in interpreting the results. As in most empirical studies on the subject, this study uses firms listed in stock exchanges as units of analysis. Our decision to consider only listed firms was guided by two factors. First, financial reports of listed firms tend to be more credible than those of non-listed firms as the latter group, in most of the cases, might not have to adhere to the strict financial reporting requirements and standards that the listed group will have to adhere to. Secondly, lack of data availability on non-listed firms meant that we restrict our analyses to listed-firms. Nonetheless, listed firms tend to be larger and also likely to have relatively better access to finance and hence their corporate finance decisions are less subject to the institutional constraints compared to non-listed firms. Thus, the results presented in the thesis may be biased towards large firms.

The study sought to extend the debate on basic capital and debt maturity structure by examining the relationship between “conventional” legal and financial institutions and capital and debt maturity structures of a firm within the context of African firms. However, very recent literature points to the role of “national culture” capital structure decisions of a firm (Li, Griffin, Yue, and Zhao 2011). In a study that investigates the influence of national cultural dimensions on dividend payouts, Shao, Kwok and Guedhami (2010) document support for the hypothesis that culture does have a role in financing decisions of a firm. Although the models that control for country differences in the present study are meant to minimize the bias that may stem from the non-inclusion of national culture variables, the present study does not tell us much about the influence of culture on firm finance.

There is virtually no prior study which attempted to investigate inter-industry variations in financing decisions of a firm within the context of African firms. In all of the hitherto chapters, this study attempted to fill this gap in the literature. We are mindful of the

fact that this approach does not tell us how industry factors affect a firm's financial decisions. Future research should consider investigating how industry factors such as industry competition and concentration, technology and risk influence financial decisions of a firm.

Research endeavours also document that adjustment speed of debt maturity structure is affected by financial crises (e.g., Deesomsak et al. 2009). Due to lack of sufficient data in the post-2008 financial crises period, we could not investigate the influence of financial crises on the financial decisions of firms in African countries.

In a study of corporate capital structure of five sub-Saharan economies, Gwatidzo (2009:90-148) underscores the importance of examining the role of heterodox variables on firms' capital structure decisions. Data availability meant that we either include fewer countries in our sample or exclude some of the heterodox variables identified in Gwatidzo. We chose to investigate the influence of "conventional" variables to gain adequate variability in the sample countries.

6.5 Directions for Future Research

Despite the fact that there has been a proliferation of theoretical and empirical efforts to advance our understanding of the dynamics pertaining to both basic capital and debt maturity structures, there has not been a universal theory that explains these important issues in modern corporate finance. Nor does this study claim to provide a conclusive answer regarding the topical questions underpinning capital and debt maturity structure decisions of a firm; far from that! There are a number of issues that this study does not address and we would like to encourage further research to address these issues. We identify the following particular avenues for future research:

1. The present study uses financial data drawn from firms listed in stock exchanges of nine countries considered in the sample. Gwatidzo (2009:223-240) notes that only few

firms are listed in African stock exchanges which often represent only a minor share of the GDP of a country. Relatively smaller firms which contribute significantly to the overall GDP of a country are not listed in African stock exchanges. In light of this, our results may be biased towards large listed companies. Although deep data sets that include listed and unlisted firms are still rare, testing the findings here with a dataset that includes both groups of firms would be appealing and worthwhile.

2. The thesis documents clear evidence that there is inter-industry variation in the dynamics pertaining to basic capital as well as debt maturity structure of firms in sample countries. Yet, MacKay and Phillips (2005) argue that this approach does not tell us how industry-specific factors determine firm financial structure, nor why financial structures vary so widely across firms within a given industry. The authors, in a study that covered 3074 firms in the US, identify such factors as a firm's position within an industry; a firm's natural hedge; the actions of other firms in the industry; a firm's status as entrant, incumbent, or exiting firm; and concentration in the industry as important industry characteristics that determine the financial structure of a firm. Future research should investigate the role of such and other industry-specific factors on a firm's financing decisions as it would deepen our understanding of the dynamics surrounding a firm's financing decisions. Such research would also proffer crucial information to governments and policymakers in their effort to craft industry-specific policy interventions.

3. In a series of papers which focused on the influence of the East Asian financial crises of 1997 on financing decisions of firms in Asia Pacific region, Deesomsak et al. (2004; 2009) proffer evidence that the crises had significant but diverse impact on firm's capital and debt maturity structure decisions. The present work does not

venture into investigating the effect of the 2008 ‘credit-crunch’ on the financing behaviour of African firms due to data limitations. Thus, as adequate data for the post-crises period trickles in, studies that examine how the 2008 global financial crises affected the financing decisions of African firms could be another promising avenue for future research.

4. This study belongs to ‘a club of many other efforts’ that were directed at understanding cross-country differences in financing practices of firms. To this end, we attempted to explain cross-country differences in financing decisions of firms in Africa by considering a range of formal institutions and macroeconomic factors. However, in a twist from conventional wisdom, Gleason, Mathur and Mathur (2000) point to the possibility that managers in different cultures may be conditioned to opt for firm-specific strategies that are culturally oriented, which may result in capital structures unique to the cultures. In a further rebuke to the entrenched practice in capital structure research, Chui, Lloyd and Kwok (2002) argue that differences in formal institutions provide only a partial answer to capital structure “puzzle”. In a study that covered 5591 firms drawn from 22 countries, the authors provide evidence that national culture is a missing piece in explaining the “puzzle”. Very recently, we note that Li et al. (2011) document evidence that national culture affects leverage decisions of foreign joint ventures in China. Although we could not consider national culture variable in the current study due to data [un]availability, it would be appealing and worthwhile to test the findings here after controlling for culture variables.
5. Lately, the literature in financial economics witnessed an avalanche of efforts that examine the role of corporate ownership patterns in financing decisions of firms (e.g., Moh'd, Pery and Rimbey 1998; La Porta et al. 1999; Mahrt-Smith 2005). Although

within a single-country context, we note that the literature on firms in Africa has witnessed efforts that investigate the nexus between the corporate ownership structure and capital structure (e.g., Boateng 2004; Abor 2008; Bokpin and Arko 2009; Ezeoha and Okafor 2009). This thesis did not venture into the investigation of the relationship between corporate ownership patterns and its financing decisions. However, a cross-country study that models the relationship between ownership structure variables and financing decisions, within the context of Africa, would contribute to global knowledge.

6. It is now fairly established that corporate governance correlates with the financing decisions of firms (e.g., Graham and Harvey 2001; Abor 2007). The current study could not examine the role of corporate governance factors on financing decisions mainly due to lack of data. However, a cross-country study that examines how corporate governance variables such as board structure influences financing decisions of firms, especially within the context of Africa, is another promising area for future research.
7. A study of similar nature could have been carried out using survey-based analysis as in Graham and Harvey (2001). However, survey based researches are also criticized owing to the fact that they do measure opinions and “impressions” of the respondent than necessarily reflecting the actual financing decisions of a firm. Further, one may hardly obtain data on as much number of firms as could be obtained through analysis of financial statements. But, it is evident that survey-based analysis may augment findings reported in this study. Thus, testing the findings reported in this thesis using survey-based analysis would be interesting and valuable.

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