MACROECONOMIC INDICATORS, CAPITAL STRUCTURE DECISIONS AND PROFITABILITY: A PANEL VECTOR AUTOREGRESSION (PVAR) APPROACH.

BY

EMMANUEL YAW MENSAAH

(10243997)

THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF AN MPHIL FINANCE DEGREE

JUNE 2014
DECLARATION

I do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in the work have been fully acknowledged. Nonetheless, I bear sole responsibility for all errors and omissions inherent in the study.

........................................ ........................................
EMMANUEL YAW MENSAH DATE
(10243997)
CERTIFICATION

We hereby certify that this thesis was supervised in accordance with the procedures laid down by the University of Ghana.

……………………………………………………………………………………………………
SIMON KWADZOGAH HARVEY, PhD
(SUPERVISOR)

……………………………………………………………………………………………………
SAM MENSAH, PhD
(CO-SUPERVISOR)

ii
DEDICATION

I dedicate this work solely to my father Mr. Emmanuel Kwasi Badu for his immeasurable contributions and unflinching support to my well-being in my academic pursuit.
ACKNOWLEDGEMENT

Firstly, I thank GOD ALMIGHTY for giving me the strength, knowledge and guidance to complete this thesis.

To my principal supervisor Dr Simon Kwadzogah Harvey, I keenly appreciate your unflinching attention, encouragement and critical evaluation of this thesis. I would also like to acknowledge the efforts of Dr Sam Mensah, my co-supervisor for his priceless and intuitive contributions on this thesis right from the beginning.

I am also appreciative of my family, my father Mr Emmanuel Kwasi Badu, my mother Mrs. Janet Kwabea and my siblings Michael, Sammy and Newton for their constant support and counsel.

To my friends Francis and Appiagyei, I am very grateful to you for your advice and encouragement.

Finally I am indebted to all those who in diverse ways helped to make this thesis successful especially to Dr Lord Mensah, Dr Elikplimi Agbloyor and Dr Godfred Alufar Bokpin who had time out of their busy schedules to attend to my needs.
ABSTRACT

The study sought to examine the impact of macroeconomic indicators on the capital structure decisions of firms and also the causal relationship between capital structure and profitability within the Ghanaian context. A panel data covering a period from 2000 to 2012 for 27 non-financial firms listed on the Ghana Stock Exchange were analysed using the Panel Vector Autoregression (PVAR) approach to mitigate endogeneity problems and more importantly to examine the causal relationship between capital structure and profitability.

Empirical results from the study suggests that short-term debt is the most popular source of funding followed by equity and finally long-term debt. A significant positive relationship is observed between Real GDP and all the three measures of capital structure. For real effective exchange rates, a positive linear relationship is observed with all the capital structure measures. However, its relationship with long-term debt ratio is insignificant. In terms of the nexus between real Interest rates and capital structure, the study observes a negative relationship with all the three measures but statistically, only the relationship with total debt ratio is significant. Inflation is observed to have an insignificant positive association with all the measures of capital structure. We note that, the causal relationship between profitability and total debt ratio as well as with short-term debt ratio is bi-directional. The causal relationship between long-term debt ratio and profitability is uni-directional flowing form long-term debt ratio to return on equity.

We suggest from the study that, in as much as corporate financial managers consider firm and industry fundamentals in deciding on their debt-equity mix, attention should be given to macroeconomic fundamentals. In addition, the fiscal and monetary policies of the government should be geared towards creating a conducive environment for firms to make informed financing decisions to optimize their capital structure.
# TABLE OF CONTENTS

DECLARATION ............................................................................................................ i 
CERTIFICATION ......................................................................................................... ii 
DEDICATION ............................................................................................................. iii 
ACKNOWLEDGEMENT ............................................................................................ iv 
ABSTRACT .................................................................................................................. v 
TABLE OF CONTENTS .............................................................................................. vi 
LIST OF TABLES ........................................................................................................ x 
LIST OF FIGURES ...................................................................................................... xi 

## CHAPTER ONE: INTRODUCTION ....................................................................... 1 
1.1 Introduction ............................................................................................................. 1 
1.2 Background to the study ....................................................................................... 1 
1.3 Research problem ................................................................................................. 3 
1.4 Research purpose ................................................................................................. 5 
1.5 Research Objectives ............................................................................................. 5 
1.6 Research Questions .............................................................................................. 6 
1.7 Significance of the research .................................................................................. 6 
1.8 Chapter outline ..................................................................................................... 7 

## CHAPTER TWO: LITERATURE REVIEW .................................................... 9 
2.1 Introduction ............................................................................................................. 9 
2.2 Ghana; a macroeconomic review ........................................................................ 10 
2.3 What is Capital Structure? ................................................................................... 11 
2.4 The theoretical framework of capital structure .................................................. 12
2.4.1. Durand’s Relevance Theory (1952): The Impact of Relative Costs of Debt and Equity on the Value of Firms

2.4.2 Modigliani and Miller (1958) – The Irrelevance theory

2.4.3 Modigliani and Miller (1963) - The trade-off theory

2.4.4 Pecking order theory

2.4.5 The market timing theory

2.4.6 Free cash flow Theory

2.4.7 Life cycle theory

2.4.8 Stakeholder co-investment theory

2.4.9 Conclusion of theoretical review

2.5 Capital structure and firm specific variables

2.5.1 The developed country context

2.5.2 The developing country context

2.6 Capital structure and macroeconomic variables

2.6.1 The developed country context

2.6.2 The developing country context

2.7 The Ghanaian context; a review

2.8 Conclusions

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

3.2 Model specification

3.3 Definitions of variables

3.4 Simultaneity/ Reverse Causality; an overview

3.5 Panel Vector Autoregression (PVAR) Model; a review
3.5.1 Pre estimation checks .......................................................................................... 43
3.5.2 Estimating a Panel Vector Autoregression (PVAR) Model .................................. 44
3.6 Justification of Variables ..................................................................................... 47
3.6.1 Dependent Variables- Measures of Capital Structure ........................................... 47
3.6.2 Independent Variables- Macroeconomic Indicators ............................................. 48
3.6.3 Independent Variables- Control variables ............................................................ 48
3.7 Sample and Sources of Data for the study ............................................................ 49
3.8 Conclusions ......................................................................................................... 49

CHAPTER FOUR: ANALYSIS AND DISCUSSION OF RESULTS ....................... 50
4.1 Introduction ......................................................................................................... 50
4.2 The Composition of capital structure employed by firms in financing their asset base. ................................................................. 51
4.3 Pre-estimation check- Panel Unit root test ............................................................. 52
4.4 PVARX lag order selection criteria ....................................................................... 53
4.5 Estimation of the panel vector autoregression with exogenous variables (PVARX). 57
4.5.1 Macroeconomic indicators, total debt ratio and profitability ............................ 57
4.5.2 Macroeconomic indicators, short-term debt ratio, and profitability .................. 61
4.5.3 Macroeconomic indicators, long-term debt ratio and profitability ...................... 64
4.6 The impact of macroeconomic indicators and firm-specific effects on the different measures of capital structure. ................................................................. 66
4.7 The causal relationship between the capital structure measures (debt ratio, short-term debt ratio and long-term debt ratio) and profitability ................................................................. 67
4.8 Post-estimation Robustness checks ...................................................................... 70
4.8.1 Test for normally distributed disturbances .......................................................... 70
4.8.2 PVARX stability condition ................................................................. 72
4.9 Conclusions ......................................................................................... 75

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 77
5.1 Introduction ......................................................................................... 77
5.2 Summary .............................................................................................. 77
5.3 Conclusions of the study ...................................................................... 81
5.4 Scope and limitations of the study ....................................................... 81
5.5 Recommendations for policy, practice and academia ....................... 82

REFERENCES ......................................................................................... 84
LIST OF TABLES

Table 3.1 Dependent variables- Measures of capital structure ......................... 36
Table 3.2 Independent variables- Macroeconomic indicators .......................... 36
Table 3.3 Independent variables- Control variables .................................... 36
Table 4.1 Fisher-type unit-root test - based on Phillips-Perron tests .............. 52
Table 4.2 Lag Order selection criteria for model 1- Macroeconomic indicators, total debt ratio and profitability .............................................. 54
Table 4.3 Lag Order selection criteria for model 2- Macroeconomic indicators, short-term debt ratio and profitability ........................................... 55
Table 4.4 Lag Order selection criteria for model 3- Macroeconomic indicators, short-term debt ratio and profitability ........................................... 56
Table 4.5 Macroeconomic indicators, total debt ratio and profitability .......... 58
Table 4.6 Macroeconomic Indicators, short-term debt ratio and profitability .... 61
Table 4.7 Macroeconomic Indicators, long-term debt ratio and profitability ... 64
Table 4.8 The impact of macroeconomic indicators and firm-specific effects on the different measures of capital structure .............................. 66
Table 4.9 Granger causality Wald tests ...................................................... 68
Table 4.10 Test of Normally distributed disturbances- Model One (1) ............ 71
Table 4.11 Test of Normally distributed disturbances- Model Two (2) .......... 71
Table 4.12 Test of Normally Distributed disturbances- Model Three (3) ......... 71
LIST OF FIGURES

Figure 4.1 The composition of Capital Structure...................................................51

Figure 4.2 PVARX stability condition- Model One (1) ........................................ 73

Figure 4.3 PVARX stability condition- Model Two (2) .......................................74

Figure 4.4 PVARX stability condition- Model Three (3)....................................75
CHAPTER ONE
INTRODUCTION

1.1 Introduction

This study has the ultimate object of contributing to extant literature on macroeconomic indicators, capital structure decisions and profitability. The purpose of this chapter is to set the stage on how this aim can be achieved. Specifically this chapter is organised according to the following subsections; background to the study, the research problem, the research purpose as well as objectives and research questions. Significance of the research, as well as an outline of the remaining chapters for the study is also explained. In short this chapter serves as an introduction to the other chapters of the study.

1.2 Background to the study

Firms whether private or public, financial or non-financial, for profit or not for profit do not exist in solitary confinement and hence do not operate in a vacuum; their operations affect and are being affected either directly or indirectly by social, economic and political environment. The success of a firm depends on the environment in which it operates; social, economic and political. The growth and economic output of firms vary with the macroeconomic developments of the economy. Karam and Mittal (2011), for instance, in their investigative study posit that conducive macroeconomic environment promotes the profitability of business, which propels them to a stage where they can access securities for sustained growth.

The financing decision (capital structure) of firms is perhaps the most researched topic area in finance in the past decades. Capital structure of firms became prominent in corporate finance discourse after Modigliani and Miller (1958) made a proposition of the relationship between capital structure and the value of firms referred to as the capital structure irrelevance
theory. Following this seminal research by these authors, capital structure of firms has gained much attention. Researchers in corporate finance have engaged in numerous research in search of empirical evidence to approve or disapprove the assertions made by these authors.

Capital structure as defined by Abor and Biekpe (2005) is a specific mixture of debt and equity a firm uses to finance its operations. Capital structure decisions are one of the critical financial decisions that financial managers have to make; investing, financing and dividend decisions. Critical to every firm is its choice between debt and equity capital (see Glen & Pinto, 1999; Abor & Biekpe, 2005; Abor, 2007; Tamulyte, 2012). For instance Abor & Biekpe (2005) observed that the decision is important because of the need to maximise returns to various organisational constituencies and also because of the impact such a decision has on an organisation’s ability to deal with its competitive environment. Tamulyte (2012) posit that capital structure decisions are vital for the firm’s financial welfare and capital structure policy is assumed to be a way of creating company’s value. Hence, a firm that makes a bad decision about its capital structure may lead to financial distress and eventually bankruptcy. In a similar fashion, Abor (2007) argued that the most important factor is for firms to choose a portfolio of capital structure that will maintain sustainability and generate more wealth. He further postulates that, a firm can choose among many alternative capital structures; it can issue a large amount of debt or very little debt, it can arrange lease financing, use warrants, issue convertible bonds, sign forward contracts or trade bond swaps. He finally asserts that in order to carry out its operational activities effectively and efficiently, a firm requires all these financing instruments or a combination of them.

The economic performance of a nation is dependent to a large extent on the stability in its macroeconomic variables, such as its exchange rate, rate of inflation, Gross Domestic
Product, interest rates, unemployment rates and others. Similarly, the stance of the macroeconomic environment affects the operations and hence profitability of organisations. It is therefore the expectation of policy makers at the macro and micro levels in an economy that these variables would remain stable and favorable to their operations. Managers of corporations for instance wish that these macroeconomic elements remain favorable to their operations and hence facilitate the achievement of their prime goal of ensuring shareholder wealth maximisation which could be achieved through sustained growth in operations, sales volume and profitability. Shareholders, both potential and current, also expect favorable development in this elements so as not to threaten the returns and (or) the security of their investment.

Macroeconomic indicators in an economy are known to largely influence a firm’s decision on its equity and debt mixture, and profitability (Yeh, 2008; Korajczyk & Levy, 2000). For example, Yeh (2008) in his study observed that some determinants of capital structure, such as growth opportunities and sales volume vary upon current state of the economy and have various investment and growth opportunities that depend upon future macroeconomic conditions, in particular economic peak and trough. But the question is whether these assertions or findings hold in a developing country like Ghana and specifically among non-financial listed firms on the Ghana Stock Exchange.

1.3 Research problem
The capital structure decisions of firms have generated a lot of theoretical and empirical research. Over the last decades a good number of the research on the determinants and determination of capital structure has focused on the effect of micro factors at the firm and industry levels (Harris & Raviv, 1991; Titman & Wessels, 1988; Rajan & Zingales, 1995; Ozkan, 2001; Huang & Song, 2006; Korajczyk & Levy, 2000). For instance Korajczyk and
Levy (2000) found that a firm’s choice of security issuance is dependent on firm specific variables. Research considering the effect of economy-wide factors such as macroeconomic conditions still remains an issue. Even so for the few research work carried out, macroeconomic indicators have been identified to influence firms’ capital structure decisions which also affect performance (see Levy, 2000; Korajczyk & Levy, 2003; Yeh, 2008; Cook, 2010). For instance Levy (2000) observed that firms that exhibit low degrees of financial constraints have pronounced counter-cyclical leverage with much of the variation attributed to varying macroeconomic conditions and this response differs with the degree of capital market access. This suggests that a firm’s decision on its debt and equity mix fluctuate steadily with macroeconomic conditions.

However, these empirical studies tended to focus mainly on developed economies. Also, most of these studies consider it from cross-country level and not much at firm level or a single country context. Thus, the questions is, do these findings hold in a developing economy such as Ghana with different institutional, regulatory and economic framework?

In Ghana, research on macroeconomic indicators and capital structure decisions still remains an issue. Extant research have examined capital structure in relation to other variables; Abor (2007) with corporate governance, Bokpin and Arko (2009) with corporate governance and ownership structure, Boateng (2004) in relation to its determinants, Amidu (2007) examined the capital structure of Banks just to mention a few. Bokpin (2009) made an investigative study of the effect of macroeconomic developments on capital structure decisions. However, the study considered firms in emerging market economies which excluded Ghana.

As observed by Bokpin and Isshaq (2008), it is obvious that almost all of the studies on capital structure have all sought to find the firm level characteristics that influence capital structure choice and the role of debt finance and its relationship with other balance sheet
variables such as assets and size in Ghanaian firms. It is imperative therefore to consider the impact of macroeconomic indicators on the capital structure decisions of firms to ascertain whether the findings in developed economies hold in a developing economy like Ghana and also whether findings from cross country studies will hold in a single country or firm level. The study employs a new and rare estimation technique, Panel vector autoregression (PVAR) considering extant literature on macroeconomic indicators and capital structure decisions.

1.4 Research purpose

The purpose of this paper is to examine the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real interest rates and real exchange rates) on the capital structure decisions of non-financial firms listed on the Ghana Stock Exchange. The causal relationship between the different measures of capital structure and profitability will be explored as well.

1.5 Research Objectives

The objectives of this study are:

I. To examine the composition of the capital structure of non-financial firms listed on the Ghana Stock Exchange.

II. To examine the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real interest rates and real effective exchange rates) on the capital structure of non-financial firms listed on the Ghana Stock Exchange.

III. To examine if the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real interest rates and real effective exchange rates) on capital structure differ with regards to the different capital structure measures.

IV. To examine the causal relationship between profitability and the different measures of capital structure.
1.6 Research Questions

To achieve the objectives, the following questions are posed;

I. Among total equity, short-term debt and long-term debt, which component do non-financial firms listed on the exchange employ the most in their capital structure?

II. What is the impact of macroeconomic indicators (Real Gross Domestic Product, Inflation, real interest rates and real exchange rates) on the capital structure decisions of firms listed on the Ghana Stock Exchange?

III. Does the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real exchange rates and real interest rates) differ with the different measures of capital structure from literature in terms of significance and direction?

IV. Is the causal relationship between profitability and the different measures of capital structure uni-directional or bi-directional?

1.7 Significance of the research

As indicated earlier, most prior studies on capital structure have focused on micro factors and neglected potential determinants at the macroeconomic level. Also most of the studies were carried out in developed economies. Literature on the effect of macroeconomic conditions on capital structure and, in particular, research on developing countries such as Ghana remains an issue. Particularly perhaps no empirical evidence from developing countries provides a helpful reference for practitioners and researchers in corporate finance, and for policy makers in industrial and economic development in Ghana. This research will provide substantial evidence to help in this direction.

To policy makers it will serve as guidance to government agencies (monetary policy committee, securities and exchange commission etc.), development agencies and the international community in their policy formulations.
To practitioners (managers, employees and organisations) this research will provide them with much insight to make informed decisions concerning their debt-equity mix.

To researchers and academicians, indeed this thesis will contribute to the existing literature on capital structure, macroeconomic indicators and profitability.

1.8 Chapter outline

This paper is organised under the following chapters; chapter one details the research background, research problem, research statement, research objective, research questions, significance of the research and research limitations. In general chapter one helps to provide an introduction to the dissertation.

Chapter two provides an overview of empirical literature on capital structure, macroeconomic indicators and profitability. Specifically the chapter is organised as follows; subsection 2.1 provides an introduction to the chapter and the essence or purpose of the chapter. The macroeconomic stance of the Ghanaian economy is considered in subsection 2.2. The definition and meaning of capital structure is detailed in subsection 2.3. A review of the traditional theories on financing decisions of firms is considered in subsection 2.4. Subsection 2.5 examines literature on firm specific variables and capital structure which seems to dominate extant literature from both the developed and developing economy context. Subsection 2.6 examines factors outside firms’ characteristics and considers literature on macroeconomic conditions and capital structure also from the developed as well as the developing economy context while subsection 2.7 considers a review of relevant literature in the Ghanaian context. The last subsection concludes the chapter.

Chapter three describes the research methodology; this chapter identifies the type of study to be carried out, the research strategy and the reasons for such a strategy. The type of data to be collected, the methods of collection and the reasons for such a method is also detailed.
The chapter is organised specifically as follows; subsection 3.2 specifies the model for the study following from prior studies on the topic. Subsection 3.3 defines the variables specified in the model. Subsection 3.4 elucidates simultaneity or reverses causality bias which will be committed as a result of running the model specified in subsection 3.2. Panel Vector Autoregression (PVAR) an alternative form of modeling that solves the bias detailed in subsection 3.5 is explained, as well as its estimation and model specification. Subsection 3.6 justifies the inclusion of the variables in the model. Sample and source of data for the study is disclosed in subsection 3.7. The chapter is concluded in subsection 3.8.

Chapter four presents and discusses the findings of the study.

Finally, the last chapter summarises the study results and concludes the discussion. It further provides a helpful reference for practitioners and researchers in corporate finance and for policy makers in industrial and economic developments in Ghana, other developing or less developed countries and economies in transition. The references follow this chapter.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

As opined by Taylor (2001), a review of literature is a classification and evaluation of what accredited scholars and researchers have written on a topic. Expressed differently, it comprises of a summary, evaluation and an overview of extant state of knowledge about a specific area of study on a specific subject of discourse.

The essence of literature is to guide and expose the researcher to various works similar to the topic under study (Brown, 1996). Beside the exposure, enlargement, guidance and broadened knowledge about the topic, it enables the researcher to gain and demonstrate skills in two ways. Firstly, it enhances the information seeking ability of the researcher in order to be able to scan extant literature efficiently to discover a set of useful articles, books and documents relevant to a topic. Secondly, it enables the researcher to engage in critical appraisal of existing literature on a topic, which is the ability to apply principles of analysis to identify unbiased and valid studies (Taylor, 2001). Literature review on a topic also helps the researcher to build upon or to fill the gaps in the works that had already been done by other scholars in the field (Fisher, 2010).

This chapter examines and reviews the empirical literature on macroeconomic indicators, capital structure decisions and profitability. Specifically the chapter is organised as follows; subsection 2.1 provides an introduction to the chapter and the essence or purpose of the chapter. The macroeconomic stance of the Ghanaian economy is considered in subsection 2.2. The definition and meaning of capital structure is detailed in subsection 2.3. A review of the traditional theories on financing decisions of firms is considered in subsection 2.4. Subsection 2.5 examines literature on firm specific variables and capital structure which
seems to dominate extant literature from both the developed and developing economy context. Subsection 2.6 examines factors outside firms’ characteristics and considers literature on macroeconomic conditions and capital structure also from the developed as well as the developing economy context while subsection 2.7 considers a review of relevant literature in the Ghanaian context. The last subsection concludes the chapter.

2.2 Ghana; a macroeconomic review

Ghana as the first country in colonial Africa to gain its independence, the country has enjoyed a stable democratic dispensation since 1992. Considered as a regional model for political and economic reform, the country has witnessed ups and downs in its macroeconomic elements. The country is rich in natural resources including gold, diamonds, manganese ore, bauxite and oil production which began in 2010. The high prices for gold and cocoa on the world market helped the country to sustain economic growth from 2008 to 2011 (IMF country report, 2013). Ghana’s industrial sector (about 30% in 2007) is more developed than in many other African countries. However, the country continues to rely heavily on agriculture and natural resources, particularly for exports (IMF country report, 2013). To ensure economic growth and development, the macroeconomic fundamentals of the economy should be sound and stable.

A stable macroeconomic environment promotes the savings necessary to finance investments - a precondition for achieving sustainable economic growth. Participants in the macro as well as micro environment are sensitive to these economic fundamentals and pray that they remain stable and favourable to their operations. These macroeconomic variables include among others, Gross Domestic Product, inflation, interest rates and exchange rates, the size of the current account deficit in relation to foreign exchange reserves, government debt, government deficits and unemployment rates. The success of an economy in any
transformation agenda is dependent on ensuring stability in its macroeconomic elements. However, as opined by Mensah (2005), Ghana’s macroeconomic policies over the last decade have been characterised by periodic financial discipline slippages, leading to volatile and generally high inflation, large exchange rate swings, and negative real interest rates for extended periods. It is important to put on point that the goal of transforming Ghana’s economy cannot materialise if Government does not do more to establish macroeconomic stability. It is not surprising that the current government has adopted an ambitious transformation agenda, centered on macroeconomic stability economic diversification, shared growth and job creation. Firms regardless of their operations need to make informed capital structure decisions in the face of this macroeconomic fundamentals.

2.3 What is Capital Structure?

The concept of capital structure has been defined by various authors. For instance Bokpin (2009) defines capital structure as a mix of debt and equity which a firm deems as appropriate to enhance its operations in the midst of the several constraints it poses. According to Abor and Biekpe (2005), capital structure is a specific mixture of debt and equity a firm uses to finance its operations. Song (2005) also defines the term as the mix of different types of securities (Debt, common stock, preferred stock, etc.) issued by a company to finance its assets. An important financial decision facing firms is the choice between debt and equity capital (Glen & Pinto, 1994). The capital structure decision of firms is one of the most important issues in finance because such decisions affect the cost of capital, capital budgeting decisions and firms’ value (Dincergok & Yalciner, 2011; Cekrezi, 2013).

The general financial well-being of a firm depends to a large extent on the decisions in relation to its capital structure. These financing decisions affect and get affected by various factors directly or indirectly be it economic, social or political. Notwithstanding these
factors, the capital structure of a firm should conform to a pattern that ensures or guarantees
the maximisation of a firm’s value. However, it is not an easy task to maximise the value of a
firm since financing decision involve making a choice between equity and debt in a balanced
proportion taking cognisance of the costs and benefits coupled with these options. This
explains the reason why financing decisions are one of the critical decisions that financial
managers face. But the question is how do firms choose their capital structure? Over the last
several decades, many researchers in corporate finance have engaged in an extensive
research to develop theories to answer this puzzling question and have gone forward to
provide varying explanations on what constitutes an optimal capital structure.

2.4 The theoretical framework of capital structure

2.4.1. Durand’s Relevance Theory (1952): The Impact of Relative Costs of Debt and
Equity on the Value of Firms

Durand’s (1952) relevance theory of capital structure was the first developed traditional
theory on capital structure. According to this theory, the value of a firm can be affected by its
capital structure. Durand’s theory was footed on three focal points or approaches. These
approaches are explained below;

**Net Income Approach:** According to this approach, Debt as a component of capital
structure is relatively cheaper than equity. Therefore, when a firm employs more of debt
financing than equity financing, its total weighted average cost of total funds or capital
including both debt and equity becomes lower, which results in an increase in the value of
the firm.

**The Net Operating Income Approach:** According to this approach Durand (1952) opined
that when more of debt is employed by a firm in its finances, the cost of its equity gets
increased because shareholders demand a risk premium for the firm’s higher debt financing.
As a result, its weighted average cost of total capital including both debt and equity becomes higher, thus decreasing the value of a firm. However, the benefit of lower cost in debt financing can totally offset the increased cost of equity, thereby having a positive impact on the value of the firm.

**The Optimal Capital Structure Approach:** According to this approach, Durand (1952) observed that the impact of capital structure on the value of a firm depends on a net balance between the benefit of debt financing (cost reduction) and the increased cost of equity (risk reduction). The result of this hypothetical analysis is that there may be an optimal capital structure where the value of a firm can be maximised, or the cost of capital minimised by adjusting the debt to equity ratio.

Durand’s traditional approach of capital structure focuses mainly on the relative costs of debt and equity and their associated impact on the value of a firm. His research pioneered the study of capital structure; however it provides only a hypothetical framework of various scenarios, with the focus on the right hand side of company’s balance sheet or on the cost difference between debt and equity.

**2.4.2 Modigliani and Miller (1958) – The Irrelevance theory**

The concept capital structure and its theories gained much attention when Modigliani & Miller (1958) established under a somehow restrictive set of assumptions that a firm’s value is unaffected by its capital structure. They contend that, it does not matter whether a firm borrows or issues shares in its operations, that is the value of a firm is determined by its real assets and not by the securities it issues. As a result, capital structure is irrelevant to the value of a firm. Their study was based on some impractical assumptions, including the following: no brokerage cost, no taxes, no bankruptcy costs and the existence of perfect markets.
2.4.3 Modigliani and Miller (1963) - The trade-off theory

M&M (1963) in a corrective analysis relaxed their idealised world assumption and opined that the expected rate of return on the common stock of a levered firm increases in proportion to the long-term debt to equity ratio, expressed in market values. In other words they posit that, the value of a firm will be enhanced if it employs more of debt instruments in its financing. M&M (1963) clarified their findings by the fact that interest payments on debt are tax-deductible, as a result, firms would enjoy a debt tax shield when funding their activities by long-term debt; hence the trade-off theory of capital structure. That is, a firm’s decision on its capital structure mix is dependent on a trade-off between tax savings (debt tax shield) and financial distress cost of debt (Miller & Modigliani, 1963; Luigi & Sorin, 2009). In simple terms these authors posit that, one benefit of debt usage is the advantage of a debt tax shield and one disadvantage is cost of potential financial distress with too much debt usage. So firms face a trade-off between debt tax shield and cost of potential financial distress in their debt employment decisions.

Pinegar and Wilbracht (1989) surveyed Fortune 500 executives concerning their views about capital structure theories from the academic world. The study of these authors established support for the existence of a funding hierarchy in managerial settings, but did not provide much hope that the trade-off model had been effectively used in practice. Notwithstanding the lack of support for the trade-off theory, they however observed that certain factors that affect the trade-off concept were identified as items of worth, namely, restrictive covenants, taxes, voting (corporate control), and the extent of tax shelters other than the tax shelter for interest expense. In a related study, Pettit and Singer (1985) observes that tax considerations are of little attention to SME’s because these firms are less likely to generate high profits and therefore are less likely to use debt for tax shields. This suggests that the trade-off theory of capital structure is not of practical significance to SME’s in their financing decisions.
Contemporary study on the financing decisions of firms has focused on relaxing M&M’s assumptions in order to develop a more realistic theory of capital structure. Until now, there has been no universal consistency about the capital-structure discuss. As a result, what drives capital-structure decisions still remains a puzzle.

However, several theories have been put forward by scholars to explain the capital structure of firms; these among others are the Pecking order theory, the Market timing theory, the free cash flow theory the life cycle theory of capital structure etc.

2.4.4 Pecking order theory

The pecking order theory developed by Myers (1984) and Myers & Majluf (1984) is based on the assumed existence of information asymmetry between shareholders, managers and creditors when a firm employs either debt or equity in its finances. Specifically these authors posit that, the existence of information asymmetry between managers and investors means that the market may undervalue a firm’s new shares relative to the value that would be assessed if the information available to managers were revealed to the market. As a result issuing new shares may harm existing shareholders through value transfer from old to new shareholders. Therefore, considering this information asymmetry, the pecking order theory of capital structure rejects the existence of an optimal capital structure because the current leverage of a firm reflects its cumulative requirements of external financing (Morri & Cristanziani, 2009). The theory therefore argues that firms normally follow a pecking or a hierarchical order in making their debt equity decisions or attracting funds. The order is as follows; internally generated funds first, followed by respective low risk debt financing, and finally equity share financing.

According to this theory, firms that are profitable and hence generate high earnings to be retained employ less of debt in their capital structure than those that do not. As a result, a
negative relationship exists between capital structure and profitability. Empirically, a number of studies provide evidence in support of this theory (Titman and Wessels, 1988; Rajan and Zingales, 1995; Wald, 1999; Booth et al., 2001).

2.4.5 The market timing theory

Baker & Wurgler (2002) in their study suggest a new theory of capital structure; that is the market timing theory of capital structure. This theory states that the current capital structure of a firm is the cumulative outcome of past attempts to time the equity market. They argue that firms time their equity issues in the sense that they issue new stock when the stock price is perceived to be overvalued, and buy back own stock when there is perceived undervaluation. Therefore fluctuations in stock prices affect a firm’s capital structure decisions. Although Market timing issuing behaviour has been established empirically by other researchers already, Baker & Wurgler (2002) in their study provide evidence that equity market timing has a persistent effect on the capital structure of the firm. They define a market timing measure, which is a weighted average of external capital needs over the past few years, where the weights used are market to book values of the firm. They find that leverage changes are strongly and positively related to their market timing measure, so they conclude that, the capital structure of a firm is the cumulative outcome of past attempts to time the equity market. Graham and Harvey (2001), in a similar study observed that managers admitted trying to time the equity market, and most of those that have considered issuing common stock report that the amount by which their stock is undervalued or over-valued was an important consideration.

2.4.6 Free cash flow Theory

Free Cash Flow Theory of capital structure predicts a direct effect of profitability on leverage (Jensen, 1986). According to this theory, when profit levels are high, management may be
tempted to use the excess cash (free cash flow) in pursing certain policies and practices to their advantage such as payment of excessive fringe benefits to themselves. Employment of more debt therefore forces managers to pay out cash as interest to debt holders and in the process reduces the free cash flow available to management. Andani and Al-hassan (2012) made further clarification from their recent study that the implication of the theory is that firms with higher profit levels have the tendency to use more debt than low profitable firms; hence a positive relationship is expected between profitability and all forms of leverage.

2.4.7 Life cycle theory

Life cycle theory of capital structure suggests that a firm’s access to finance depends on its stage of development. It posit that newer firms tend to rely on owners’ initial equity because they may not initially be in the position to present an attractive investment avenue for finance providers (Chittenden et al., 1996; Berger & Udell, 1998). This theory therefore suggests that the age and extent of growth and development of a firm has an impact on its leverage.

2.4.8 Stakeholder co-investment theory

According to Frank and Goyal (2003), the Stakeholder co-investment theory of capital structure also suggests that in order to ensure the willingness of stakeholders, such as shareholders, employees and business partners to make valuable co-investments, some firms prefer to use little debt when compared to other firms.

2.4.9 Conclusion of theoretical review

Unfortunately, these proposed theoretical models are not adequate enough to fully explain the scrutinised dynamics of financing decisions of firms documented in the literature (Myers, 1984; Barclay & Smith, 2005; Baum et al., 2013). For instance, Myers (1984) pointed out that financial economists have not hesitated to give advice on capital structure, even though how firms actually chose their capital structures remains a puzzle as the theories developed
did not seem to explain fully the actual financing behaviour of firms. In a similar position, Barclay and Smith (2005) revisited the capital-structure puzzle and also concluded that different capital structure theories lead to different and diametrically opposed decisions and outcomes. Similarly, Stretcher and Johnson (2011) noted that the application of traditional capital structure theory is often impractical. These authors unveiled numerous tools including leverage multiples and debt-servicing multiples which to them provide a more practical guidance for use by professional managers to make informed decisions about their capital structure.

2.5 Capital structure and firm specific variables

2.5.1 The developed country context
As indicated earlier in chapter one, over the last several decades most of the related research on the determinants and determination of capital structure focus on the effect of micro factors at the firm and industry levels. Empirically, extant literature has documented that tax shield, assets structure, profitability, firm size, growth opportunities, risk, liquidity, industry class and product uniqueness are the firm specific key attributes which determine the capital structure of firms. (Titman & Wessels, 1988; Harris & Raviv, 1991; Rajan & Zingales 1995; Ozkan 2001; Booth et al., 2001; Korajczyk & Levy, 2003; Huang & Song, 2006; Delcoure, 2007; Levy & Hennessy, 2007).

Titman and Wessels (1988) in their pioneering study observed that firms with unique or specialised products have relatively low debt ratios. Uniqueness in their study is categorised by the firms’ expenditures on research and development, selling expenses, and the rate at which employees voluntarily leave their jobs. They contend that, smaller firms tend to use significantly more short-term debt than larger firms and also find some support for the proposition that profitable firms have relatively less debt relative to the market value of their
equity. In analysing the relationship among taxes, financing decisions and the firm’s value, Fama and French (1998) concluded that corporate debt does not grant tax benefits. Besides, high leverage degree generates agency problems among shareholders and creditors that predict negative relationships between leverage and profitability. They conclude that, the negative information relating debt and profitability obscures the tax benefit of the debt.

Al-Najjar and Hussainey (2011) in revisiting the capital-structure puzzle in UK observe from their study that corporate characteristics (firm size, firm risk, firm growth rate, firm profitability and asset tangibility) and corporate governance characteristics (board size and outside directorships) are the main drivers of capital structure of UK firms. In addition, their results show that changing the definition of capital structure may result in changing the sign and the significance of these potential drivers.

Using international data, Rajan and Zingales (1995) examined the capital structure discuss in then G7 countries and observed that market-to-book ratio and profitability have a negative impact on a firm’s capital structure. Ozkan (2001) in a related study found that profitability, liquidity, non-debt tax shield and growth opportunities are negatively related to capital structure. They also observed that there is a limited support for a positive relationship between firm size and capital structure. Exploring the drivers of capital structure choice in a sample of Central and Eastern European countries, Delcoure (2007), in his study observes that asset tangibility has a positive effect on firms’ capital structure and a negative relationship exist between profitability and capital structure decisions. Daskalakis and Psillaki (2008) investigated the capital structure determinants of small and medium sized enterprises (SMEs) using a sample of Greek and French firms. These authors assessed the extent to which the debt to assets ratio of firms depends upon their asset structure, size, profitability and growth rate. Their results show that the SMEs in both countries exhibit similarities in their capital structure choices and that asset structure and profitability have a
negative relationship with leverage, whereas firm size is positively related to their debt to assets ratio. Growth however is observed to be statistically significant only for France and is positively related to debt. They attribute these similarities to the common institutional and macroeconomic characteristics of both countries. For instance they note that between 1998 and 2002 Greek and France recorded an average real GDP growth rate of 3.9% and 2.9% respectively, Inflation rate of 3.4% and 1.4% respectively and their lending rates averaged 10.8% and 6.7% respectively. Both countries however recorded an average unemployment rate of 11%. The results from this study suggest that the institutional and macroeconomic stance of an economy has an influential effect on the capital structure decisions of firms.

2.5.2 The developing country context

Notwithstanding the voluminous research on the firm specific determinants of capital structure in the developed economies, a sample of research has also considered this phenomenon in the context of developing countries. Umer (2013) examined the determinants of capital structure of large taxpayer share companies in Ethiopia and observes that size, age, tangibility, liquidity position and non-debt tax shield of a company are positively correlated with leverage, whereas profitability, earnings volatility and dividend payout ratio are negatively associated with leverage. Growth variable was however found to be statistically insignificant in affecting leverage. The sign of these relations from their study suggests that, agency cost theory provides more convincing evidence than other capital structure theories in elucidating the capital structure of large taxpayer share companies in Ethiopia.

Rataporn et al. (2004) investigated the determinants of capital structure of firms in four countries from the Asia Pacific region. According to their findings, firm size has a positive effect on leverage while growth opportunities, non-debt tax shield, liquidity and share price performance have a negative effect on leverage supporting major capital structure theories.
Sumit and Pradeep (1999) examined the relationship between the level of debt in the capital structure and performance for a sample of Indian firms. Using a large dataset for over 1000 Indian firms for a period ranging from 1988 to 1994, the result of their study suggested that the effect of debt equity ratio of the sample firms on their performance is negative and significant.

One other prominent work in the context of developing countries is the work by Booth et al., (2001). These authors studied the portability of capital structure decisions from developed to developing economies. In essence, they examined whether the factors that affect capital structure decisions in developed economies also hold in developing countries and observed that debt ratios in developing countries seem to be affected in the same way and by the same type of variables that are significant in developed countries. They however explain that, there are systematic differences in the way these ratios are affected by country factors, such as GDP growth rates, inflation rates, and the development of the capital markets and that knowing these factors help predict the financial structure of a firm better than knowing only its nationality. This assertion by these authors substantiates the fact that in as much as capital structure of firms is significantly affected by firm specific and industry characteristics, the macroeconomic stance or development of a nation also plays a significant role in the determination of a firm’s debt equity mix and hence cannot be underemphasised. The assertion by these authors especially stimulates this study.

2.6 Capital structure and macroeconomic variables

2.6.1 The developed country context

As observed by Abzari et al. (2012), macroeconomic variables are mentioned as considerable external factors which seem to affect capital structure of firms in different countries, despite the little attention that has been paid to them. That is, the link between
macroeconomic development and capital structure of firms has been detailed but not as extensive as micro factors. Nonetheless for the few work carried out, macroeconomic indicators have been observed to influence firms capital structure which also affect performance (Antoniou et al., 2002; Korajczyk & Levy, 2003; Banjeree et al., 2004; Loof, 2004; Harkbarth et al., 2006; Berger & Bonaccorsi di Patti, 2006; Drobetz et al., 2007). For example Antoniou et al. (2002) find that the capital structure choice of a firm is not only affected by its own specific characteristics, but also by its surrounding environment such as general health of the economy, the existence of a stock market as well as the size of banking sector.

Capital structure decisions as Demirguc-Kunt and Maksimovic (1998), posit, 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 firm’s investment opportunity set and its financing needs. Harkbarth et al. (2006) observed that when a firm can adjust its capital structure dynamically, both the pace and the size of adjustment depend on the macroeconomic conditions. They further indicate that firms typically will be able to borrow more funds in a boom, even assuming a constant loss given default. They contend that, if the recovery rate is pro-cyclical, the debt capacity of the firm in a boom can be up to 40% larger than the debt capacity of that same firm in a contraction. Hence firms should adjust their capital structure more often and by smaller amounts in booms than in recessions. Korajczyk and Levy (2000) found that a firm’s choice of security issuance is dependent on macroeconomic conditions and firm-specific variables. They postulate that, after correcting for the run-up in the equity market and the variation in the expected price reaction to an equity issue announcement, deviations from target leverage ratios that vary with macroeconomic conditions account for a significant amount of variation in issue choice (see
also Myers & Majluf, 1984 and Bokpin, 2009). Concluding they assert that firms tend to time the issuance of securities to periods of favourable macroeconomic conditions.

In a similar study, Korajczyk and Levy (2003) examine the impact of macroeconomic conditions on capital structure choice for financially constrained and unconstrained firms. They find evidence that target leverage is counter-cyclical for financially constrained firms, while pro-cyclical for financially unconstrained firms. That is, financially unconstrained firms take into account the macroeconomic condition when issuing debt or equity more than constrained firms, whose issue choice follows less the macroeconomic movements.

Cook (2010) investigates the role of macroeconomic conditions on capital structure adjustment speed and observes that, firms tend to adjust faster toward their target leverage in a good macroeconomic state. He contends that macroeconomic conditions should have an impact on firm's capital structure target decisions. This is because, according to the trade-off theory; target leverage is determined by balancing debt tax benefits with bankruptcy costs, both of which are dependent on macroeconomic conditions. Giving more meaning to their findings, they posit that tax benefits depend on taxable earnings, which are a function of the state of the economy. Similarly, the probability of default and losses, which affect bankruptcy costs, are related to economic trends such as inflation. Thus, variations in macroeconomic conditions should determine variations in target leverage.

Drobertz et al. (2007) in analysing the impact of firm-specific characteristics and macroeconomic factors on speed of adjustment towards target leverage observed that firms adjust faster in favourable macroeconomic conditions, such as a situation where interest rates are low and the risk of disruption in the global financial system is negligible. They also document that faster growing firms as well as firms that are further away from their target
adjust more towards their target leverage. Loof (2004) also argues that over adjustment of leverage may reflect unanticipated changes in economic conditions.

Using the partial adjustment model with the financial constraint of over-leverage and under-leverage taken into account, Yeh and Roca (2010) investigate the impact of macroeconomic conditions and their interactions with firm-specific factors on the determination of capital structure in Taiwan. They observed that macroeconomic conditions have a positive impact on capital structure decisions for firms with the financial constraint of under-leverage relative to the target debt ratio. In addition, the interaction between macroeconomic conditions and firm-specific variables also affect capital structure decisions; however, this effect depends on whether the firms are over-leveraged or under-leveraged relative to their target debt ratios. They also find that, the variation in the rate of adjustment toward their target debt ratios is dependent on whether the firms are over-leveraged or under-leveraged as against their debt-ratio target.

Ramamurti and Vernon (1991) found significant variations in capital structures among emerging market economy firms to suggest not only that financing choice is different between developed and developing countries, but also note that it varies within the developing countries. These factors suggest that different economic environments and institutional factors have influence on the choice or mix of debt and equity for firms. Therefore, other factors aside firm specific variables such as macroeconomic developments in a country can account for the choice of financing by firms.

In examining the effect of perceived macroeconomic variables by financial managers on capital structure decisions of firms listed on the Tehran Stock Exchange, Abzari et al. (2012), employed a detailed set of questionnaire to collect data about perception of macroeconomic variables, namely GDP, interest rate, inflation rate and exchange rate. They note that there is
no significant relationship between perceived macroeconomic variables and the way Iranian corporations arrange their capital structure. However, majority of financial managers express the significant effect of exchange rate, inflation rate and interest rate, in order of importance, on capital structure of firms.

In similar studies, it is noted that GDP growth rate, which proxies for the overall state of the economy in a country, inflation rate and interest rate are considered important factors that significantly influence the capital structure of firms (Corcoran, 1977; Gulati & Zantout, 1997; Mahmud, 2003, Lemma & Negash, 2013). For example, Mahmud (2003) found that the capital structure choice of a firm is not only affected by its own specific characteristics, but also by its surrounding environment such as general health of the economy and the amount of economic activities in the country determined by GDP. He examined the impact of GDP and interest rate as two macroeconomic variables on corporate financing in three Asian countries; Japan, Malaysia and Pakistan and observed that growth in GDP per capita was significantly influencing growth in the capital structure of companies in Japan and Malaysia. For Pakistan, this variable shows insignificant relationship with all leverage ratios. However, interest rate was a major definitive factor affecting demand for credit in all three countries. Lemma & Negash (2013) noticed that a firm is likely to employ more of debt instruments under inflationary periods since inflation not only decrease the real value of debt but also increase the real tax advantage of debt.

Joveer (2005) in examining the capital structure of small firms observed that there are no stylised facts about the capital structure of small firms. Specifically, the study evaluates the explanatory power of firm-specific, country of incorporation, institutional and macroeconomic factors from 10 Western European countries to contrast the sources of leverage across small and large firms. He confirms the stylised facts of the capital structure
for large and listed firms, but otherwise for smaller companies. Another observation made was that, firstly; the country of incorporation carries much more information for small firms supporting the idea that small firms are more financially constrained and face non-firm-specific problems in their capital structure choice. Secondly using two different leverage measures, he shows that the relationship of firm size and tangibility to leverage is robust to the measure used for the listed but not for unlisted firms.

Jong et al. (2008) analysed the direct and indirect impacts of firm-specific factors and country specific factors of a number of firms from 42 developed and developing countries and found that tangibility and firm size in half of the countries have a positive effect on long-term debt ratios at market value, whereas growth opportunities and profitability have a negative effect. They noticed that the bond market development and GDP growth rate have a positive impact, while creditor right protection has a negative impact on the long-term debt ratios at market value.

Allayannis et al. (2002) in examining a firm’s choice between local currency, foreign currency, and synthetic local currency (hedged foreign currency) debt and the role of debt type in financial and operating performance revealed the fact that fluctuations in exchange rate (a macroeconomic variable) can have effect on a firm’s choice of financing. They contend that, depreciating local currency may lead firms to reduce foreign currency debt and subsequently decrease the whole amount of liabilities if they would not be able to substitute it by a local currency debt. In line with this study, Broll et al. (2005) noted from their study that exchange rate risk management of the multinational firm is indicated to have direct impact on its international capital structure decision and on its currency of denomination decision.
It is observed that extant literature on macroeconomic indicators and capital structure decisions in the developed country context has mostly been a cross country study with a few in a single country context. Moreover, the results obtained from the various studies are varying and hence inconclusive necessitating a study in a single country context.

### 2.6.2 The developing country context

Despite the comparatively concentrated research on developed economies at the expense of developing economies, quite a number of research have been carried out in the developing country context. Using a large dataset from 34 emerging countries during a 17-year period, 1990-2006, Bokpin (2009) observed that the effect of macroeconomic factors on capital structure varies with capital structure measurement variables. He observed that bank credit is significant in predicting capital structure choices of firms and that a significantly negative relationship exists between gross domestic product (GDP) per capita and capital structure choices. Inflation from his study positively influences the choice of short-term debt over equity. In addition he documents that Stock market development is insignificant in predicting capital structure decisions of firms and expectations of increasing interest rate positively influences firms to substitute long-term debt for short-term debt over equity.

Muthama et al. (2013) examined selected macroeconomic variables on corporate capital structure of listed companies in Kenya. Using an econometric model of multiple linear regressions and regressing leverage (debt ratios) against GDP growth rate, inflation and interest rate. They observed that indeed macroeconomic factors have pronounced influence on the capital structure of the listed companies. GDP growth rate was found to have a positive influence on long-term debt ratio and a negative influence on total debt ratio and short-term debt ratio. Inflation on the other hand had a negative influence on the short-term debt. Interest rates as measured by the treasury bills rate was observed to have a positive
influence on the long-term debt ratio and total debt ratio, and a negative influence on the short-term debt ratio.

Çekrezi (2013) using a panel data methodology in exploring the impact of firm specific factors and macroeconomic factors on capital structure decision for a sample of 69 non-listed firms in Albania over the period 2008-2011 established that, asset tangibility, size, risk, GDP growth rate and interest rate have a significant positive impact on leverage whiles profitability has a significant negative impact. Liquidity, however, has a negative but not a significant relation with leverage.

Jorgensen and Terra (2002) also investigated both firm specific, macroeconomic and institutional factors on capital structure decisions in seven Latin America countries and observed that tangibility, size, and the presence of tax shields vary across the targeted countries, and that, only profitability shows a consistent negative behaviour, while a limited support was found for business risk. With regards to growth opportunities, the empirical evidence from their study offers more support for a positive relationship when book values of leverage are used, but the sign of the relationship turns negative with market value leverage. The result of pooled country estimation also shows that only profitability is consistently negative across the different proxies of capital structure. The effect of real GDP growth and inflation are found to be negative, whereas their combined explanatory power is not significant. The most important finding of the study by these authors is that, the explanatory power of the firm specific factors outweighs the explanatory power of the institutional and macroeconomic factors.

In all, it is observed that extant literature considering macroeconomic indicators and capital structure decisions have mostly concentrated on developed economies with most of the studies being in a cross country context. The question is, do the findings from these studies
hold in single country contest and also a developing and emerging economy such as Ghana with different institutional, regulatory and economic framework? This question among others is what this study seeks to provide answers to.

2.7 The Ghanaian context; a review

In Ghana there have been extensive research on the financing decision of firms (Boateng, 2004; Abor, 2005; Abor, 2007; Abor & Biekpe, 2005; Abor & Biekpe, 2007; Bokpin & Arko, 2009; Amidu, 2007; Bokpin & Isshaq, 2008; Oppong-Boakye et al., 2013). For instance, Abor (2005) examined the effect of debt-equity mix on profitability of firms listed on the Ghana Stock Exchange and observed a significantly positive relationship between the ratio of short-term debt to total assets and return on equity (a proxy for profitability). A negative relationship was observed between the ratio of long-term debt to total assets and return on equity and a significantly positive association between the ratio of total debt to total assets and return on equity. In explaining the capital structure of SME’s in Ghana, Abor and Biekpe (2007) observed that age, size, asset structure, profitability, and growth are factors that affect the financing decisions of Ghanaian SME’s with short-term debt being an important source of their finance.

Abor (2007) in assessing corporate governance and capital structure decisions of listed firms on the Ghana Stock Exchange observed that there is a positive but not statistically significant association between board size, board composition and Chief Executive Officer (CEO) duality and a negative relationship between the tenure of the CEO and the capital structure decisions of firms. The findings suggest that, entrenched CEO’s employ lower debt in order to reduce the performance pressures associated with high debt capital.

In a related study, Bopkin and Arko (2009) also examined ownership structure, corporate governance and capital structure decisions of firms and revealed that managerial
shareholdings significantly and positively influence the choice of long-term debt over equity. Also, board size is said to be positively and statistically significantly related to capital structure choices. They contend that firm level factors such as volatility in earnings, asset tangibility, dividend payout ratio and profitability are significant determinants of corporate capital structure decisions on the Ghana Stock Exchange.

In examining the capital structure of banks in Ghana, Amidu (2007) observed that profitability, corporate tax, growth, asset structure and bank size influence banks financing decisions and that more than 87 percent of the banks’ assets are financed by debt with short-term debt representing more than three quarters of their capital structure. Boateng (2004) assessed firm specific factors influencing the capital structure of international joint venture formation in Ghana. He observed that size of joint venture, type of joint venture industry and ownership level of joint venture partner have a positive bearing on the capital structure of joint ventures in Ghana. Oppong-Boakye et al. (2013) investigated the determinants of capital structure using dataset from 33 listed and non-listed companies during the period 2003 –2007 in Ghana. They found long-term debt to be an irrelevant component of capital structure of large unquoted and quoted firms in Ghana as there is greater reliance on equity. Furthermore, they observed that profitability, size, business risk and tangible assets have positive correlation with level of gearing of companies in Ghana. On the other hand, growth and tax indicate a negative correlation with the level of gearing.

Bokpin and Isshaq (2008) examined the impact of stock market development on the financing choice of listed firms in Ghana. They regressed debt-equity ratios on market size and market liquidity variables using ARIMA models and observed that stock market development has not led to the substitution of equity for debt as suggested by extant literature. Also the size of the Ghanaian stock market is not yet significant to impact on
financing choices of firms on the exchange. The authors further observed that short-term debt was significantly negatively related to the market size variable and turnover ratio (a measure of market liquidity), but insignificantly positively related to the other measure of market liquidity.

As observed by Bokpin and Isshaq (2008), it is obvious that almost all the studies on capital structure have sought to find the firm level characteristics that influence capital structure choice and the role of debt finance and its relationship with other balance sheet variables such as profitability, asset size and others in Ghanaian firms. Extant literature in Ghana on the impact of economy-wide factors (macroeconomic conditions) on financing decisions of firms remains an issue. It is therefore critical to examine whether macroeconomic indicators (real gross domestic product, real effective exchange rates, inflation and real interest rates) affect capital structure decisions from the context of a developing economy considering non-financial firms listed on the Ghana Stock Exchange.

2.8 Conclusions

This chapter considers extant literature on macroeconomic indicators and capital structure decisions. The chapter starts with an introduction which explains the need for a literature review and how the researcher went about it. A macroeconomic overview of Ghana’s economy is considered as well as the definition and meaning of the concept of capital structure and also a note on how critical capital structure decisions are to financial managers in making their financial decisions. The theoretical underpinnings of the concept of capital structure is also considered and a conclusion is made that unfortunately the proposed theoretical models developed are not enough to fully explain the observed dynamics of financing decisions of firms as documented in literature and hence the capital structure decisions of firms still remains a puzzle.
An empirical review of the concept of capital structure and firm level factors which seems to dominate the capital structure discourse is also examined from the context of developed as well as developing economies. It is observed that in as much as the capital structure of firms is significantly affected by firm specific effects, the macroeconomic stance also plays a critical role in the determination of a firm's debt-equity mix and hence cannot be ignored.

Although macroeconomic indicators and capital structure decisions have not been extensively examined in the corporate finance literature, comparatively a few number of studies have considered it. From the review of empirical literature from the developed as well as developing economies context, it could be observed that, quite unfortunately most of the studies have focused on developed economies at the expense of developing economies. Also most of these studies are in cross country context with a few being in a single country context. Moreover, the results obtained from these studies are varying and hence inconclusive necessitating the need for a single country study in a developing economy like Ghana with different regulatory, economic and institutional framework.

A review of empirical literature in the Ghanaian context is considered and an obvious observation is capital structure decisions are being examined mostly with firm level factors ignoring the macro-wide variables (macroeconomic indicators) hence making it an issue worth pursuing. The methodological stance of the study which elucidates the approaches or methods to be employed in achieving the set objects of the study follows this chapter.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter follows from the review of literature on macroeconomic indicators, capital structure decisions and profitability that enable an understanding of why this research should be carried out. It describes the research methodology; it identifies the type of study to be carried out, the research strategy and the reasons for such a strategy. In short this chapter unveils details and justifies the procedures to be followed in achieving the set objectives of the study.

The chapter is organised specifically as follows; subsection 3.2 specifies the model for the study following from prior studies on the topic whiles subsection 3.3 defines the variables specified in the model. Subsection 3.4 elucidates simultaneity or reverses causality bias which will be committed as a result of running the model specified in subsection 3.2. Panel Vector Autoregression (PVAR) an alternative form of modeling that solves the bias detailed in subsection 3.5 is explained as well as its estimation and model specification. Subsection 3.6 justifies the inclusion of the variables in the model. Sample and source of data for the study is disclosed in subsection 3.7. The chapter is concluded in subsection 3.8.

3.2 Model specification

Due to the panel character of the data, the study initially purports to employ a panel data methodology using a simple multiple regression analysis following suit Cekrezi (2013) who examined the impact of firms’ specific factors and macroeconomic indicators on the capital structure of small unlisted firms in Albania and also drawing some percepts from Abzari et al. (2012) who analysed the impact of financial managers' perception of macroeconomic variables on capital structure of firms listed on the Tehran Stock Exchange and other extant
literature on macroeconomic indicators, capital structure decisions and profitability. A panel data methodology involves the pooling of observations on a cross-section of units over several time periods and provides results that are simply not detectable in pure cross-sections or pure time-series studies (Baltagi, 2005). In addition, panel data methodology gives the researcher a large number of data points, thereby increasing degrees of freedom and reducing collinearity among explanatory variables and provides a means of reducing the missing variable problem (Hsiao, 1986). It also makes it possible to explore the dynamics of adjustment of a particular phenomenon overtime (Baltagi, 2005).

The general form of a panel data model is

$$ Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it} \ldots \ldots \ldots (1) $$

Where:

Subscript i denotes the cross sectional dimension (firm) and t denotes the time series dimension (time)

$Y_{it}$ is a $(k \times 1)$ vector of dependent variables which is the capital structure measures of the firm.

$\alpha_i$ is a $(k \times 1)$ vector of constants for all periods (t) and specific to firm (i)

$\beta$ is a $(k \times k)$ matrices of the coefficients or parameter estimates for the explanatory variables.

$X_{it}$ is $(k \times 1)$ vector of the explanatory variables in the model

$\varepsilon_{it}$ $(k \times 1)$ vector of error terms in the model.

To estimate and empirically examine the relationship between macroeconomic indicators, capital structure decisions and profitability, three models are formulated considering the three measures of capital structure employed, macroeconomic variables considered as well as firm-specific factors controlled for. In line with Cekrezi (2013) and other extant literature as mentioned earlier with modifications, the initial models for the study are specified mathematically as;
Model 1

$$DR_{it} = \beta_0 + \beta_1 INFL_t + \beta_2 LnRIR_t + \beta_3 LnREER_t + \beta_4 LnRGDP_t + \beta_5 RISK_{it} + \beta_6 SIZE_{it} + \beta_7 ROE_{it} + \epsilon_{it}$$

.............................................. (2)

Model 2

$$SDR_{it} = \beta_0 + \beta_1 INFL_t + \beta_2 LnRIR_t + \beta_3 LnREER_t + \beta_4 LnRGDP_t + \beta_5 RISK_{it} + \beta_6 SIZE_{it} + \beta_7 ROE_{it} + \epsilon_{it}$$

.............................................. (3)

Model 3

$$LDR_{it} = \beta_0 + \beta_1 INFL_t + \beta_2 LnRIR_t + \beta_3 LnREER_t + \beta_4 LnRGDP_t + \beta_5 RISK_{it} + \beta_6 SIZE_{it} + \beta_7 ROE_{it} + \epsilon_{it}$$

.............................................. (4)

$\beta_0$ is the constant and $\beta_1$ to $\beta_7$ are the coefficients, slope or parameter estimates for the Independent variables.
3.3 Definitions of variables

Table 3.1: Dependent Variables- Measures of Capital Structure

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the total debt ratio for firm i in time t.</td>
</tr>
<tr>
<td>Is measured as the ratio of total debt to total assets.</td>
<td></td>
</tr>
<tr>
<td>SDR&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the short-term debt ratio for firm i in time t.</td>
</tr>
<tr>
<td>Is measured as the ratio of short-term debt to (total equity + total debt).</td>
<td></td>
</tr>
<tr>
<td>LDR&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the long-term debt ratio for firm i in time t.</td>
</tr>
<tr>
<td>Is measured as the ratio of long-term debt to (total equity + total debt).</td>
<td></td>
</tr>
</tbody>
</table>


Table 3.2: Independent Variables- Macroeconomic Indicators

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>LnRGDP&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the real Gross Domestic Product at time t.</td>
</tr>
<tr>
<td>Is measured as the year on year gross domestic product at constant 2000 prices.</td>
<td></td>
</tr>
<tr>
<td>LnINFL&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the Inflationary rate at time t.</td>
</tr>
<tr>
<td>Is measured as the percentage changes in the Consumer Price Index.</td>
<td></td>
</tr>
<tr>
<td>LnRIR&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the real interest rate at time t.</td>
</tr>
<tr>
<td>Is measured as the 91 day Government of Ghana Treasury bills rates deflated using the fisher’s effect.</td>
<td></td>
</tr>
<tr>
<td>LnREER&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the exchange rate at time t.</td>
</tr>
<tr>
<td>Is measured as the value of the Ghanaian cedi against a weighted average of several foreign currencies divided by a price deflator.</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.3: Independent Variables- Control Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the measure of probability of default for firm i in time t.</td>
</tr>
<tr>
<td>It is defined as ratio of standard deviation of Earnings before interest and taxes (EBIT) to Average value of EBIT.</td>
<td></td>
</tr>
<tr>
<td>SIZE&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the measure of the size of firm i in time t.</td>
</tr>
<tr>
<td>It is defined as the natural logarithm of total assets of a firm.</td>
<td></td>
</tr>
<tr>
<td>ROE&lt;sub&gt;t&lt;/sub&gt;</td>
<td>is the proxy for the measure of the profitability of firm i in time t.</td>
</tr>
<tr>
<td>It is defined as ratio of Earnings before Interest and taxes to Total Equity.</td>
<td></td>
</tr>
</tbody>
</table>
The definition of Risk follows that of Cekrezi (2013), Size is in line with, Cekrezi (2013), Amidu (2007) and Abor (2007) and that of return on equity follows suit Abor (2005).

3.4 Simultaneity/Reverse Causality; an overview

The study purports to use an ordinary least squares estimator to estimate the coefficients for the explanatory variables. But considering extant literature, the capital structure of a firm has been observed to have a causal effect on profitability both from theory (Jensen and Meckling, 1976; Jensen 1986; Berger and Bonaccorsi di Patti, 2006) and empirics (Sumit and Pradeep, 1999; Abor, 2005; Ahmad et al., 2012; Kar, 2012). From the theoretical point of view, Jensen and Meckling (1976) with their famous agency cost theory of capital structure posit that as firms employ more debt as against equity, the value of a firm increases as a result of the reduction of the agency cost of outside equity which compels managers by constraining or encouraging them to act more in the interest of equity holders. Therefore capital structure is deemed to have an impact on a firm’s performance. From empirical literature, Abor (2005) examined the effect of capital structure on profitability of listed firms in Ghana. He observed that there is a significant positive relation between the ratio of short-term debt to total assets and return on equity as well as the ratio of total debt to total assets and return on equity, but a negative relationship exists between the ratio of long-term debt to total assets and return on equity.

Similarly, profitability has been observed to influence a firm’s capital structure decisions (Abor, 2007; Titman & Wessels, 1988; Rajan & Zingales, 1995; Antoniou et al., 2002; Daskalakis & Psillaki, 2006 and Frank & Goyal, 2009, Cekrezi, 2013). For instance Rajan and Zingales (1995) examined the capital structure discourse in G7 countries and observed that profitability has a negative impact on firms’ capital structure.
Berger and Bonaccorsi di Patti (2006) tested the agency costs theory hypothesis by using profit efficiency as an indicator of firm performance and by employing a simultaneous-equations model that accounts for reverse causality from firm performance to capital structure and find that data on the US banking industry are consistent with the agency cost theory. Specifically, they observed that higher leverage or a lower equity capital ratio is associated with higher profit efficiency over almost the entire range of the observed data, and the results are statistically significant, economically significant, and robust. Taking cognisance of the revelations from these authors, return on equity (ROE), a measure of profitability and the measures of capital structure namely debt ratio, long-term debt ratio and short-term debt ratio are endogenous to the models specified in subsection 3.2. This implies that they are determined within the model, with the other variables been exogenous, that is determined outside the model. In modeling the model specified in subsection 3.2, we commit endogeneity bias specifically simultaneity or reverse causality bias.

According to Verbeek (2008), a situation of reverse causality or simultaneity naturally arises when the dependent variable and one or more of the independent variables in a model are simultaneously determined. It refers to the possibility that not only the explanatory variable in this case the ROE (a proxy for profitability) has an effect on the independent variable (the measures of capital structure), but also the capital structure measures has a causal effect on return on equity. Generally if one considers a model where one or more of the explanatory variables are jointly determined with the dependent variable(s), the Ordinary Least Square estimator will typically provide inconsistent and biased estimates for the behavioral parameters in the model, the same holds for the constant term or the intercept. Statistically it means the model does not correspond to a conditional expectation so the usual assumptions on the error term cannot be imposed (Verbeek, 2008). Hence we cannot argue with respect to this study that the ROE and the disturbance term are uncorrelated. To make the study robust
and to generate consistent and unbiased parameter estimates and most importantly to examine the causal relationship based on the historical dynamics between the measures of capital structure and return on equity (proxy for profitability), the study employs a Panel Vector Autoregression (PVAR) model.

3.5 Panel Vector Autoregression (PVAR) Model; a review

To effectively explore the reverse causality between the measures of capital structure and profitability as documented in literature without committing the simultaneity bias and at the same time producing consistent and unbiased estimates, we convert the above models specified in subsection 3.2 into a PVAR model.

PVAR models are simply a panel form of Vector Autoregression (VAR) models, that is a Vector Autoregression model with a cross sectional dimension. Concerns about the validity of some of the assumptions used in traditional macro econometric models in the 1980’s brought about the development of VAR’s as a modeling tool. Sims (1980), in particular, argued that the restrictions used to identify the parameters in traditional models which often took the form of excluding variables or their lags from equations, or assuming that a particular variable was exogenous were “incredible”. He contended that such exclusion restrictions or exogeneity assumptions were rarely sufficiently defined and justified by theory, and that there was likely under identification of such models once these problems were taken into account. As a result, some of the economic interpretations drawn from such models were unlikely to be robust.

PVAR’s are dynamic system of equations in which the current level of each endogenous variable in the system depends on the past movements in that variable and in other endogenous variable as well as the current level of other exogenous variables in the system. In short PVAR models describe the dynamic evolution of two or more endogenous variables
from their common history. The term panel is due to the fact that the study employs a panel data, vector is due to the fact that we are dealing with a vector of two or more variables and the term autoregression is due to the appearance of the lagged values of the dependent variables on the right-hand side of the regression equations in the system (Gujarati, 2004). This simple framework provides a systematic way to capture rich dynamics in multiple time series and panels, and the statistical toolkit that comes with PVAR’s is easy to use and interpret (Stock and Watson, 2001). A simple PVAR of two variables $X_{it}$ and $Z_{it}$ is of the form:

$$X_{it} = a_{01} + \sum_{j=1}^{k} a_{11j}X_{it-j} + \sum_{j=1}^{k} a_{12j}Z_{it-j} + \varepsilon_{it1}$$

$$Z_{it} = a_{02} + \sum_{j=1}^{k} a_{21j}X_{it-j} + \sum_{j=1}^{k} a_{22j}Z_{it-j} + \varepsilon_{it2}$$

The above system can be rewritten as:

$$\begin{bmatrix} X_{it} \\ Z_{it} \end{bmatrix} = \begin{bmatrix} c_{01} \\ c_{02} \end{bmatrix} + \sum_{j=1}^{k} \begin{bmatrix} a_{11j} & a_{12j} \\ a_{21j} & a_{22j} \end{bmatrix} \begin{bmatrix} X_{it-j} \\ Z_{it-j} \end{bmatrix} + \begin{bmatrix} \varepsilon_{it1} \\ \varepsilon_{it2} \end{bmatrix}$$

With $X_{it}$ and $Z_{it}$, $a_{ij}$'s, $X_{it-j}$ and $Z_{it-j}$ and $\varepsilon_{it}$'s as Vectors and the $a_{1j}$ and $a_{2j}$ as a 2 by 2 Matrices and $\varepsilon_{it}$'s are stochastic error terms referred to as impulses, shocks or innovations in the language of VAR. The above can be estimated with OLS estimator since $\varepsilon_{it1}$ and $\varepsilon_{it2}$ are uncorrelated with $X_{it-j}$ and $Z_{it-j}$. 

40
The models for the study specified in subsection 2 in a simple multiple regressions are converted into a PVARX (Panel vector autoregression with exogenous variables) model as follows;

Model 1

\[ DR_{it} = \beta_{01} + \sum_{j=1}^{k} \beta_{11j} DR_{it-j} + \sum_{j=1}^{k} \beta_{12j} ROE_{it-j} + \beta_{13} INFL_t + \beta_{14} \ln RIR_t + \beta_{15} \ln REER_t + \beta_{16} \ln RGDP_t + \beta_{17} RISK_t + \beta_{18} \ln SIZE_t + \epsilon_{it1} \]

\[ ROE_{it} = \beta_{02} + \sum_{j=1}^{k} \beta_{21j} DR_{it-j} + \sum_{j=1}^{k} \beta_{22j} ROE_{it-j} + \beta_{23} INFL_t + \beta_{24} \ln RIR_t + \beta_{25} \ln REER_t + \beta_{26} \ln RGDP_t + \beta_{27} RISK_t + \beta_{28} \ln SIZE_t + \epsilon_{it2} \]

Model 2

\[ SDR_{it} = \beta_{01} + \sum_{j=1}^{k} \beta_{11j} SDR_{it-j} + \sum_{j=1}^{k} \beta_{12j} ROE_{it-j} + \beta_{13} INFL_t + \beta_{14} \ln RIR_t + \beta_{15} \ln REER_t + \beta_{16} \ln RGDP_t + \beta_{17} RISK_t + \beta_{18} \ln SIZE_t + \epsilon_{it1} \]

\[ ROE_{it} = \beta_{02} + \sum_{j=1}^{k} \beta_{21j} SDR_{it-j} + \sum_{j=1}^{k} \beta_{22j} ROE_{it-j} + \beta_{23} INFL_t + \beta_{24} \ln RIR_t + \beta_{25} \ln REER_t + \beta_{26} \ln RGDP_t + \beta_{27} RISK_t + \beta_{28} \ln SIZE_t + \epsilon_{it2} \]
Model 3

\[ LDR_{it} = \beta_{01} + \sum_{j=1}^{k} \beta_{11j} LDR_{it-j} + \sum_{j=1}^{k} \beta_{12j} ROE_{it-j} + \beta_{13} \text{INFL}_{t} + \beta_{14} \text{LnRIR}_{t} \]
\[ + \beta_{15} \text{LnREER}_{t} + \beta_{16} \text{LnRGDP}_{t} + \beta_{17} \text{RISK}_{it} + \beta_{18} \text{SIZE}_{it} + \varepsilon_{it1} \]

\[ ROE_{it} = \beta_{01} + \sum_{j=1}^{k} \beta_{21j} LDR_{it-j} + \sum_{j=1}^{k} \beta_{22j} ROE_{it-j} + \beta_{23} \text{INFL}_{t} + \beta_{24} \text{LnRIR}_{t} \]
\[ + \beta_{25} \text{LnREER}_{t} + \beta_{26} \text{LnRGDP}_{t} + \beta_{27} \text{RISK}_{it} + \beta_{28} \text{SIZE}_{it} + \varepsilon_{it2} \]

Where, each of the three models is a system comprising of two simultaneous or regressions equations, \( i = 1 \ldots N \) and \( t = 1 \ldots T \), \( k \) is the maximum number of lag terms for each variable where \( j \) runs from 1 to \( k \). The \( \varepsilon_{it} \)'s are the error terms in the model which are supposed to be a white term process. \( \beta_{11j}, \beta_{12j}, \beta_{21j}, \text{ and } \beta_{22j} \) are the coefficients of linear projection of the capital structure measures (profitability (ROE)) onto the past values (lags) of the capital structure measures (profitability (ROE)) and profitability (capital structure measures).
3.5.1 Pre estimation checks

Before the estimation of the panel vector autoregression model, there is the need to check for possible unit roots in the panels.

Panel unit root test

In order to avoid spurious regressions, the study performs a panel unit root test to examine the panels to ensure that there are no unit roots and hence the establishment of their stationarity. This is a very critical pre-estimation diagnostics because if the variables in the regression model are not stationary, the standard assumptions for the asymptotic analysis will not be valid so we cannot undertake hypothesis test about the regression parameters.

In the literature of panel unit root tests there are two main generation of test, these are the first generation unit root tests and the second generation unit root tests. The first generation unit root tests operates on the assumption of cross-sectional independence among panel units. (Levin and Lin 1992, 1993; Levin et al., 2002; Harris and Tzavalis 1999; Im et al., 1997, 2002, 2003). As opined by Hurlin and Mignon (2006), the cross-sectional independency hypothesis is restrictive and somewhat unrealistic in the majority of macroeconomic applications of unit root tests. This is because the application of first generation tests to panels that are characterised by cross-sectional dependencies leads to size distortions and lower power as observed by Banerjee et al. (2000) hence their high probability of yielding biased results.

In response to the need for panel unit root tests that allows for cross-sectional dependencies or correlations, various tests have been proposed by scholars belonging to the second generation tests. This generation of panel unit root tests unlike the first generation tests that considers interdependence across units as a nuisance, aims at exploiting these co-movements in order to define a new test statistic (Hurlin and Mignon, 2006).
Following from empirical literature and in order to perform a robust panel unit root test, the study employs the Fishers type- Phillips-Perron (P-P) unit root test, a second generation panel unit root test as proposed by Moon & Perron (2004a) and Phillips & Sul (2003a). This test can be viewed as a development to the Augmented Dicker-Fuller test statistics that have been made robust to serial correlation by using the Newey-West (1987) heteroskedasticity and autocorrelation consistent covariance matrix estimator.

To explain further, the Dicker-Fuller test as proposed by Dicker and Fuller (1976) involves fitting the regression line,

\[ \Delta Y_{it} = \alpha + \beta Y_{it} - 1 + \delta t + U_{it} \]  

(1)

by ordinary least square (OLS) but serial correlation will present a problem. To account for this, the augmented Dicker-Fuller test’s regression includes lags of the first differences of \( Y_{it} \). The Phillips-Perron test as a further development involves fitting equation 1, and the results are used to calculate the test statistics as follows;

\[ \Delta Y_{it} = \alpha + \pi Y_{it} - 1 + \delta t + U_{it} \]  

(2)

In (1) \( U_{it} \) may be heteroskedastic. The P-P tests correct for any serial correlation and heteroskedasticity in the errors \( U_{it} \) non-parametrically by modifying the augmented Dickey Fuller test statistics.

**3.5.2 Estimating a Panel Vector Autoregression (PVAR) Model**

The estimation of a PVAR model is done with an ordinary least square (OLS) estimator for both equations at the same time considering this study. Basically, this model simultaneously regresses each endogenous variable (capital structure and profitability) on the past values of
itself and those of all related endogenous variables as well as the current levels of the exogenous variables in this case the macroeconomic variables and other firm specific variables controlled for. Estimation involves choosing which variables to include in the system and deciding on the number of lags. The strength of the parameter estimates obtained depends on these two choices. Usually the number of lags is determined by statistical criteria and variable selection is informed by economic theory (Verbeek, 2008).

PVAR relaxes two limitations that are usually imposed on the relationship between the dependent and the independent variable in a normal regression (Tang, 2008). First of all, it makes no assumptions about the number of lag terms to be included in the model. Theoretically, the model as specified assumes an infinite number of lags for the endogenous variables. However, in practice, this assumption does not hold as the lags do not have to go to infinity. Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion Schwarz Bayesian Information Criterion (SBIC) and Final Prediction Error (FPE) are the selection criteria which helps to determine the number of lag terms that generates the most reliable and maximum amount of information out of the data. In practice the number of lag terms that generate the minimal value of AIC, SBIC, HQIC FPE, or other information criteria statistics is chosen (Tang, 2008). This number of lags selected is deemed the optimal lag length which is enough to capture the dynamics of the system modeled and at the same time not consuming too many degrees of freedom.

The second assumption PVAR relaxes is the direction of causality. With two equations and simultaneous regressions, the model treats both variables equally and does not make prior assumption that causality flows from say variable X to variable Y or the reverse. Instead, the PVAR model employs several procedures such as the Granger causality test, the impulse response function and Forecast error variance decomposition to deliver the information about causal direction and relationship in the results after running the model.
The Granger causality test operates as follows; a variable $Z$ is said to be Granger-caused by another variable $X$ if $Z$ can be predicted more efficiently when the information on the past and present values of $X$ is taken into account than when it is not in addition to all other available information. The statistical term ‘Granger causality’ is actually a misnomer (inappropriate) in PVAR because it does not mean what the term causality means literally and more generally. However, given the information provided by the Granger test, one can assert hypothetical causal declaration with confidence (Tang, 2008). The impulse response function on the other hand graphically demonstrates the response of a variable to a change from another variable over a certain period of time whiles forecast error variance decomposition shows the proportion of the forecast error variance in a variable that is explained by the other variable at each time period. In addition to demonstrating the causal relationship between two variables, PVAR’s most importantly, also discloses the historical dynamics of the relationship between the variables considered. By introducing lag terms, PVAR’s shows how each lag term of one variable is associated with the current value of other variables.

One can confidently and safely draw standard statistical inferences from the historical dynamics and make causal statements between the measures of capital structure and return on equity (a proxy for profitability) from such timing structures shown in test criteria such as Granger causality test, the impulse response function and variance decomposition all embedded in the PVAR package. In exploring the causal relationship between the measures of capital structure and profitability, the study employs the Granger causality test.
3.6 Justification of Variables

3.6.1 Dependent Variables- Measures of Capital Structure

The debt component of capital structure comprises of long-term debt and short-term debt. Abor and Biekpe (2007) opined that short-term debt includes bank overdraft, bank loans payable within a year and other current liabilities. Long-term debt also includes long-term bank loans and other long-term liabilities repayable beyond one year, such as directors’ loans, hire purchase and leasing obligations.

The study employs three capital structure measures as dependent variables namely total debt to total assets ratio, short-term to (total equity plus total debt) ratio and long-term debt to (total equity plus total debt) ratio. The employment of different capital structure measures is motivated by Al-Najjar and Hussainey (2011), Bokpin (2009) and Amidu (2007). Al-Najjar and Hussainey (2011), for example, observes from their study that changing the definition of capital structure may result in changing the sign and the significance of the potential drivers of capital structure. Bokpin (2009) also makes a similar observation from his study; his results largely suggest that the effect of macroeconomic factors on capital structure varies with capital structure measurement variable in most cases. Amidu (2007) also highlighted the importance of distinguishing between long and short forms of debt when making inferences about capital structure of banks in Ghana. He observes that given the relatively high proportion of short-term debt financing of banks in Ghana, overall leverage of banks is negatively related to operating assets. However, splitting the duration of debt into long and short components, he found that long-term debt ratio is positively and statistically related to operating assets.

It is therefore imperative to examine if macroeconomic variables have an influential effect on capital structure decisions, this effect will vary with respect to the different measures.
3.6.2 Independent Variables- Macroeconomic Indicators.

As Kyereboah-Coleman and Aggire-Tetteh (2009) observes, generally, the barometers for measuring the performance of the economy include among others the Gross Domestic Product growth rate, the rate of inflation, the exchange rate, fiscal position and the debt position. They contend that of these variables, exchange rate, interest rate and the rate of inflation can be singled out to affect stock market activity as they impinge directly on the state of corporate activity in the country.

Taking cognisance of their studies and other extant literature, the explanatory variables for this study will include Gross Domestic Product (GDP), inflation rates, interest rates and exchange rates. GDP, interest rates and exchange rates are adjusted from their nominal to real values to adjust for inflationary effects. We convert them to their natural logs to account for spatial differences.

3.6.3 Independent Variables- Control variables

In line with Kale et al. (1991), Mishra and McCounaghy (1999), Bopkin (2009), Abor & Biekpe (2007), Al-Najjar and Hussainey (2011), we control for some firm specific variables which also inform the financing decisions of firms. These variables include Risk (RISK), Size (SIZE) of the firm, and profitability (ROE). (See also Titman and Wessels, 1988; Shyam-Sunder & Myers, 1999; Al-Sakran, 2001; Hovakimian et al., 2004; Abor & Biekpe, 2005).

Following the reasoning by Myers (1984) that book values are proxies for the value of assets in place, all the variables used are based on book values. (See also Amidu, 2007 and Abor & Biekpe, 2007).
3.7 Sample and Sources of Data for the study

The sampling units for this study comprises of twenty five (27) non-financial firms listed on the Ghana Stock Exchange for the thirteen year period (2000-2012) all forming a total of three hundred and fifty one (351) pooled observations. Firms on the stock exchange are considered due to the uniformity of financial data as listed firms are mandated to prepare timely and standard financial statements which are unnoticed of firms not listed on the exchange. Listed Banks are not considered due to their regulatory requirements and also the peculiar nature of their capital structure as evidenced from the findings of Amidu (2007) on the study of the capital structure of Banks in Ghana. He observed that, more than 87 per cent of the banks’ assets are financed by debt and out of this, short-term debt appear to constitute more than three quarters of the capital structure of the banks. The thirteen (13) year period is considered in order to make the study robust and to be able to draw a standard statistical inference.

Sources of data for the study are detailed as follows; data on capital structure and firm characteristics that inform capital structure decisions of firms is derived from the annual reports of the selected listed firms. Data on macroeconomic indicators is derived as follows; real interest rates is derived from the Bank of Ghana, Gross Domestic Product and inflation is derived from the Ghana Statistical Services whiles real effective exchange rates is derived from the African Development Indicators.

3.8 Conclusions

The chapter considers the methods to be followed in other to achieve the set objects of the study. It specifies the model for the study, justifies and defines variables in the specified model and discloses the sample and sources of data for the study. The next chapter presents the analysis and discussion of findings.
CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter follows from the methodology of the study which details the general methods to be used in achieving the set objectives of the study. It details the analysis and discussion of findings following from the employed methodology.

As indicated earlier in chapter one, the study seeks to achieve the following objectives. First is to examine the composition of the capital structure of non-financial firms listed on the Ghana Stock Exchange. Second is to examine the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real exchange rates and real interest rates) on the capital structure of non-financial firms listed on the Ghana Stock Exchange. Third is to examine if the impact of macroeconomic indicators (Real Gross Domestic Product, inflation, real interest rates and real exchange rates) on capital structure differ with regards to three different capital structure measures (debt ratio, short-term debt ratio and long-term debt ratio). The last objective is to examine the causal relationship between profitability and three different capital structure measures (total debt ratio, short-term debt ratio and long-term debt ratio).

The first objective of the study is achieved by a pie chart illustration of the total equity, the short-term debt and the long-term debt as a percentage of total capital. The estimation of the PVARX models specified in chapter three are estimated separately to achieve the second, third and fourth objectives of the study.
4.2 The Composition of capital structure employed by firms in financing their asset base.

We proceed with the first objective of the study which is to examine the composition of total capital employed by non-financial firms listed on the Ghana Stock. This is achieved by a pie chart representation of the components of total capital (that is total equity, short-term debt and long-term debt) as a percentage of total capital.

**Figure 4.1: The Composition of capital structure**

From figure 4.1, with TE, LTD and STD indicating total equity, long-term debt, and short-term debt all as a percentage of total capital respectively, it is observed that total equity and long-term debt form 38% and 18% of total capital respectively. Short-term debt however forms 44% of the capital structure of non-financial listed firms. This implies that, short-term debt is the most popular source of finance among non-financial listed firms followed by total equity and finally to debt of long-term duration. This findings can be attributable to the underdeveloped nature of the bond market in Ghana and also due to the ease with which firms attract debt of short-term duration such as short-term loans etc. as against the issue of shares and long-term debt such as debentures, bonds and loans of long-term duration. Short term debt being popular than total equity is in line with the pecking order theory which posit that firms following the hierarchical order resort to low risk debt financing before equity.
4.3 Pre-estimation check- Panel Unit root test

To begin with the estimation of the PVARX models, we need to first perform a unit root test to ensure that there are no unit roots and hence the establishment of the stationarity of the panels in order to avoid spurious regressions. A panel, say, \( Y_{it} \) is said to be stationary if its mean and variance do not change systematically over time. This test is very critical to the strength of the estimates since as opined by Nelson and Ploser (1982), majority of macroeconomic data are non-stationary or have unit roots.

Table 4.1: Fisher-type unit-root test - based on Phillips-Perron tests

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>STATISTICS</th>
<th>P-VALUE</th>
<th>CONCLUSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt ratio*</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -34.3246</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-term debt ratio*</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -30.2592</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term debt ratio</td>
<td>Inverse Logit t (139)</td>
<td>0.0002</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -3.6088</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return on equity</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -9.4582</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -8.4655</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size*</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -29.3700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>Inverse Logit t (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -14.2321</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural logarithm of Real GDP*</td>
<td>Inverse Logit (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -4.1552</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural logarithm of Real Interest rates</td>
<td>Inverse Logit (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -7.1741</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural logarithm of Real exchange rates*</td>
<td>Inverse Logit (139)</td>
<td>0.0000</td>
<td>Stationary</td>
</tr>
<tr>
<td></td>
<td>L* -7.7831</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Computations from research data, 2014. *First difference
Table 4.1 presents the results for the Phillips-Perron panel unit root test. The Null hypothesis ($H_0$) states that, all panels contain unit roots and hence are not stationary while the alternate hypothesis ($H_a$) states that at least one panel is stationary. From the table, it is observed that long-term debt ratio, return on equity, risk, inflation and natural logarithm of real interest rates are stationary at their levels or integration to the order zero while debt ratio, short-term debt ratio, size, natural log of real GDP and natural log of real exchange rates are integrated to the order one or are stationary at their first difference. This is because they all have a p-values less than 0.05. To conclude we refuse to accept the null hypothesis that all panels contain unit roots and accept the alternate hypothesis that at least one panel is stationary. Having all variables stationary, there is no need for a co-integration test of long run relationship between the variables. The next step is to determine the optimal lag length for the estimation of the three PVARX (a panel vector autoregression with exogenous variables) models.

4.4 PVARX lag order selection criteria

As indicated in chapter three, to estimate a panel vector autoregression model, a priori knowledge of the number of lags to be included in the model for the endogenous variables is required. PVAR’s usually provide a selection criteria appropriate for running the model. This is very critical to the strength of the parameter estimates to be derived. The number of lags to be selected by the PVAR selection criteria is enough to capture the dynamics of the system and also do not consume too many degrees of freedom. The lag order selection criteria embedded in the PVAR includes the Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion, Schwarz Bayesian Information Criterion (SBIC), Final prediction error (FPE) etc. The three models specified all require a specified lag length separately before estimation.
Table 4.2: Lag Order selection criteria for model 1- Macroeconomic indicators, total debt ratio and profitability

<table>
<thead>
<tr>
<th>LAG</th>
<th>LL</th>
<th>LR</th>
<th>Df</th>
<th>P</th>
<th>FPE</th>
<th>AIC</th>
<th>HQIC</th>
<th>SBIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-945.218</td>
<td>1.3678</td>
<td>5.99511</td>
<td>6.06094</td>
<td>6.15997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-881.413</td>
<td>127.61</td>
<td>4</td>
<td>0.000</td>
<td>0.947062</td>
<td>5.62133</td>
<td>5.70598</td>
<td>5.8333</td>
</tr>
<tr>
<td>2</td>
<td>-867.401</td>
<td>28.025</td>
<td>4</td>
<td>0.000</td>
<td>0.889635</td>
<td>5.55876</td>
<td>5.66221</td>
<td>5.81783</td>
</tr>
<tr>
<td>3</td>
<td>-853.724</td>
<td>27.355</td>
<td>4</td>
<td>0.000</td>
<td>0.837451</td>
<td>5.49827</td>
<td>5.62053*</td>
<td>5.80445*</td>
</tr>
<tr>
<td>4</td>
<td>-849.122</td>
<td>9.2024</td>
<td>4</td>
<td>0.056</td>
<td>0.83435</td>
<td>5.49451</td>
<td>5.63559</td>
<td>5.84779</td>
</tr>
<tr>
<td>5</td>
<td>-843.112</td>
<td>12.021*</td>
<td>4</td>
<td>0.017</td>
<td>0.823983*</td>
<td>5.48195*</td>
<td>5.64183</td>
<td>5.88233</td>
</tr>
</tbody>
</table>

Endogenous: DR ROE
Exogenous: RISK SIZE LnRGDP INF LnRIR LnREER _cons

Source: Computations from research data, 2014.

From table 4.2, it is observed that the optimal lag length for the estimation of the model as selected by the criteria are lags three (3) and five (5). The Hannan-Quin selection criterion (HQIC) and the Schwartz-Bayesian selection criterion (SBIC) all selected lag three (3) as the optimal lag length for the estimation whiles the LR, the Final Prediction Error (FPE) and the Achaike Information criterion (AIC) deemed lag five (5) as the optimal lag length. In practice, the number of lag terms that generate the minimal value of AIC, SBIC, HQIC, or other information criteria statistics is deemed appropriate for estimation (Tan, 2008). It is observed that lag five (5) generates a minimal value for FPE and it is the minimum value among all the selection criteria, therefore lag five (5) is chosen as the optimal lag length. Furthermore, to ensure that the PVAR utilises the best lag length in estimation, a test run estimation is conducted using both lags three(3) and five (5). Upon a careful scrutiny of the results, it is observed that the results from lag five (5) are meaningful for interpretation as
against lag three (3). On top of that, results from the diagnostic test of residuals proved that lag five was a better option for the estimation as against lag three. Therefore for the estimation of model one, lag five (5) is the best lag that is enough to capture the rich dynamics of the model whiles at the same time not consuming too many degrees of freedom.

Table 4.3: Lag Order selection criteria for model 2- Macroeconomic indicators, short-term debt ratio and profitability.

| Panel variable: FIRM (strongly balanced) |
| Time variable: YEAR, 2000 to 2012 delta: 1 unit |

<table>
<thead>
<tr>
<th>LAG</th>
<th>LL</th>
<th>LR</th>
<th>Df</th>
<th>P</th>
<th>FPE</th>
<th>AIC</th>
<th>HQIC</th>
<th>SBIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-945.218</td>
<td>1.37626</td>
<td>5.99511</td>
<td>6.06094</td>
<td>6.15997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-881.413</td>
<td>127.614</td>
<td>0.000</td>
<td>0.947062</td>
<td>5.62133</td>
<td>5.70598</td>
<td>5.8333</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-867.401</td>
<td>28.025</td>
<td>0.000</td>
<td>0.889635</td>
<td>5.55876</td>
<td>5.66221</td>
<td>5.81783</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-853.724</td>
<td>27.355</td>
<td>0.000</td>
<td>0.837451</td>
<td>5.49827</td>
<td>5.62053*</td>
<td>5.80445*</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-849.122</td>
<td>9.2024</td>
<td>0.056</td>
<td>0.83435</td>
<td>5.49451</td>
<td>5.63559</td>
<td>5.84779</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>-843.112</td>
<td>12.021*</td>
<td>0.017</td>
<td>0.823983*</td>
<td>5.48195*</td>
<td>5.64183</td>
<td>5.88233</td>
<td></td>
</tr>
</tbody>
</table>

Endogenous: SDR ROE
Exogenous: RISK SIZE LnRGDP INF LnRIR LnREER _cons

Source: Computations from research data, 2014.

From table 4.3, we note that HQIC and SBIC deem lag three (3) as the optimal lag length while LR, FPE and AIC deem lag five (5) as the optimal lag length for estimation of Model two. Again, following from practice as opined by Tan (2008) and conducting diagnostic test of residuals, lag five (5) is deemed as the optimal lag length for the estimation of model two since it produces a better result meaningful for interpretation as against lag three (3). Hence for the second model, lag five (5) is the lag length that is deemed to capture the rich dynamics of the system whiles at the same time not consuming too many degrees of freedom.
Table 4.4 Lag Order selection criteria for model 3- Macroeconomic indicators, long-term debt ratio and profitability.

Panel variable: FIRM (strongly balanced)
Time variable: YEAR, 2000 to 2012  delta: 1 unit

<table>
<thead>
<tr>
<th>LAG</th>
<th>LL</th>
<th>LR</th>
<th>Df</th>
<th>P</th>
<th>FPE</th>
<th>AIC</th>
<th>HQIC</th>
<th>SBIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-722.13</td>
<td></td>
<td></td>
<td>0.341323</td>
<td>4.60081</td>
<td>4.66665</td>
<td>4.76568</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-640.033</td>
<td>164.2</td>
<td>4</td>
<td>0.000</td>
<td>0.209502</td>
<td>4.1127</td>
<td>4.19735*</td>
<td>4.32467*</td>
</tr>
<tr>
<td>2</td>
<td>-634.418</td>
<td>11.228</td>
<td>4</td>
<td>0.024</td>
<td>0.207404*</td>
<td>4.10262*</td>
<td>4.20607</td>
<td>4.42237</td>
</tr>
<tr>
<td>3</td>
<td>-632.591</td>
<td>3.6612</td>
<td>4</td>
<td>0.455</td>
<td>0.210247</td>
<td>4.11619</td>
<td>4.23846</td>
<td>4.4159</td>
</tr>
<tr>
<td>4</td>
<td>-631.787</td>
<td>1.6086</td>
<td>4</td>
<td>0.807</td>
<td>0.214499</td>
<td>4.13617</td>
<td>4.27724</td>
<td>4.48945</td>
</tr>
<tr>
<td>5</td>
<td>-625.728</td>
<td>12.117*</td>
<td>4</td>
<td>0.017</td>
<td>0.21177</td>
<td>4.1233</td>
<td>4.28318</td>
<td>4.52369</td>
</tr>
</tbody>
</table>

Endogenous: LDR ROE
Exogenous: RISK SIZE LnRGDP INF LnRIR LnREER _cons

Source: Computations from research data, 2014.

Also we observe from table 4.4 that while HQIC and SBIC deem lag one (1) as the optimal lag length, FPE and AIC deem lag five (2) as the optimal lag length for estimation of Model two. Once again, following from practice as opined by Tan (2008) and also conducting a diagnostic test of residuals, lag (2) is deemed the optimal lag length for the estimation of model three since it produces a better results meaningful for interpretation as against lag three (3). Hence for the third model, lag two (2) is the lag length that is deemed to capture the rich dynamics of the system whiles at the same time not consuming too many degrees of freedom.
4.5 Estimation of the panel vector autoregression with exogenous variables (PVARX).

After determining the optimal lag length for the three models specified, the study proceeds with the estimation of the PVARX models to achieve the second, third and fourth objectives.

To achieve the third and fourth objectives of the study, three capital structure measures are considered; total debt ratio, short-term debt ratio and long-term debt ratio. Where, total debt ratio is given as the ratio of total debt to total assets, short-term debt ratio is given as the ratio of short-term debt to total equity plus total debt and long-term debt ratio is given as the ratio of long-term debt to total equity plus total debt. This results in three different system of PVARX models consisting of two regression equations each estimated differently. This models are considered one after the other.

4.5.1 Macroeconomic indicators, total debt ratio and profitability

Table 4.5 presents the PVARX results of the first model by Stata version 13.1. The R-square which is a measure of the co-efficient of determination shows that about 59.68 % and 7.08 % of the variations in debt ratio and return on equity are explained by the regressors in both equation where DR and ROE are used respectively. It is observed that, jointly the co-efficients in the first equation of the PVARX system are significantly different from zero at 5% significance level (P-value = 0.00 < 0.05). In other words, there is a significant linear relationship between the regressand (debt ratio) and the regressors (macroeconomic and firm specific variables). Considering the second regression equation in the model, the P-value of 0.081 provides the evidence that jointly the regressors (macroeconomic and firm specific variables) have a significant relationship with the regressand (return on equity) at 10% significance level (P-value=0.0813).
### Table 4.5. Macroeconomic indicators, total debt ratio and profitability

<table>
<thead>
<tr>
<th>Endogenous variables (DR ROE), lags(1/5), exogenous variables (RISK SIZE LnRGDP INF LnRIR LnREER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample: 2000 – 2012 No. of obs = 321 Log likelihood = -843.1118 AIC = 5.481949 FPE = 0.6834089 HQIC = 5.64183 Det(Sigma_ml) = 0.5668197 SBIC = 5.882333</td>
</tr>
</tbody>
</table>

| Equation | Parms | RMSE | R-sq | chi2 | P>|chi2| |
|----------|-------|------|------|------|-------|------|
| DR       | 17    | 0.2287 | 0.5968 | 473.6264 | 0.0000 |      |
| ROE      | 17    | 3.7712 | 0.0708 | 24.3909  | 0.0813 |      |

| DR       | Coef. | Std. Err. | Z     | P>|z| |
|----------|-------|------------|-------|------|
| DR       |       |            |       |      |
| L1       | 0.6035 | 0.0682     | 8.84  | 0.000*** |
| L2       | 0.0308 | 0.1071     | 0.29  | 0.774 |
| L3       | -0.0791 | 0.1136    | -0.70 | 0.486 |
| L4       | 0.0557 | 0.1129     | 0.49  | 0.622 |
| L5       | -0.0250 | 0.0899    | -0.28 | 0.781 |

| ROE      | Coef. | Std. Err. | Z     | P>|z| |
|----------|-------|------------|-------|------|
| ROE      |       |            |       |      |
| L1       | -0.0091 | 0.0033    | -2.71 | 0.007*** |
| L2       | -0.0182 | 0.0034     | -5.34 | 0.000*** |
| L3       | -0.0463 | 0.0077     | -6.01 | 0.000*** |
| L4       | -0.0063 | 0.0071     | -0.90 | 0.370 |
| L5       | -0.0220 | 0.0074     | -2.97 | 0.003*** |

| RISK     | 0.0006 | 0.0029     | 0.19  | 0.847 |
| SIZE     | 0.0153 | 0.0023     | 6.77  | 0.000*** |
| LnRGDP   | 0.0077 | 0.0026     | 2.99  | 0.003*** |
| INF      | 0.6146 | 0.4489     | 1.37  | 0.171 |
| LnRIR    | -0.1447 | 0.0086   | -1.72 | 0.086* |
| LnREER   | 0.4492 | 0.2428     | 1.85  | 0.064* |
| Constant | -0.3400 | 0.1299   | -2.62 | 0.009*** |

| ROE      | Coef. | Std. Err. | Z     | P>|z| |
|----------|-------|------------|-------|------|
| ROE      |       |            |       |      |
| L1       | -1.0358 | 1.1253    | -0.92 | 0.357 |
| L2       | 1.7082 | 1.7661     | 0.97  | 0.333 |
| L3       | 1.4620 | 1.8731     | 0.78  | 0.435 |
| L4       | -5.5442 | 1.8616   | -2.98 | 0.003 |
| L5       | 2.5857 | 1.4818     | 1.74  | 0.081 |

| ROE      | Coef. | Std. Err. | Z     | P>|z| |
|----------|-------|------------|-------|------|
| ROE      |       |            |       |      |
| L1       | 0.0367 | 0.0551    | 0.67  | 0.505 |
| L2       | 0.1778 | 0.0561     | 3.17  | 0.002*** |
From estimation of the first model, the results shows that lag one of debt ratio has a positive significant relationship with debt ratio while lags two and four have a positive but statistically insignificant relationship. Lags three and five have a negative but insignificant relationship with debt ratio. A significant negative relationship is observed between all the lags of return on equity and debt ratio with the exception of lag four which is insignificant. This means that, as the profit level of firms’ increases they employ less debt (both short-term and long-term) in their finance. This results renders credence to the pecking order theory of capital structure which implies that firms that are profitable and therefore generate high earnings are expected to use less debt capital than those that do not generate high earnings. It is however in stark contrast with the free cash flow theory by Jensen (1986) which posits that, profitable firms employ more of debt finance to get rid of excess profits at management’s disposal. From empirical endeavors, it is consistent with the findings of Tittman and Wessels (1998), Delcoure (2007), Umer (2013). Risk measured as the volatility in the earnings of a firm has a positive but statistically insignificant relationship with total debt ratio.

Real Gross Domestic Product has a positive significant relationship with total debt ratio. This implies that as Gross Domestic Product of the economy increases, non-financial firms listed
on the exchange employ more debt (both short-term and long-term) in their financing. This is consistent with the findings of Cekrezi (2013) who examined the impact of macroeconomic variables and firm specific variables on the capital structure of listed firms in Albania. This positive relation is also observed in several empirical literature such as Mateus (2006), Salehi and Manesh, (2012) but contrary to the study of Gurcharan (2010), and Dincergok and Yalciner (2011).

The size of a firm measured as the natural logarithm of total assets has a positive significant linear relationship with the total debt of a firm implying that as the asset base of a firm increases, they tend to employ more of debt financing in their capital structure. This is in line with the trade-off theory of capital structure which posits that larger firms employ more debt in their financing (Frank & Goyal, 2009), and also in line with the study of Daskalakis and Psillakin (2008) who examined the determinants of the capital structure of SME’s in France and Greece.

Real interest rate and real effective exchange rate have statistically significant negative and positive relationship with debt ratio respectively. This implies that, as interest on treasury bills increases, firms employ less debt instruments in their financing. They however employ more debt instruments as the cedi appreciates against the weighted index of foreign currencies. There is a positive but statistically insignificant relationship between debt ratio and inflation in line with the study of Cekrezi (2013) but contrary to Bokpin (2009) who found a negative insignificant relationship.

Considering the second regression in the first model, the second lag of return on equity has a significant positive relationship with return on equity. The linear relationship with all the other macroeconomic variables and firm-specific variables with return on equity is not statistically significant.
4.4.2 Macroeconomic indicators, short-term debt ratio, and profitability.

Table 4.6 shows the results from the estimation of the second PVARX model that is macroeconomic indicators, short-term debt ratio and profitability. The co-efficient of determination as measured by the R-square shows that 60.87% and 9.39% of the variations in short-term debt ratio and return on equity are explained by variations in the regressors in both equations respectively. From the p-values of both equations, it is observed that the regressors in both equations jointly have a significant relation with debt ratio and return on equity as indicated by P-values of 0.000 and 0.0070 respectively.

Table 4.6: Macroeconomic indicators, short-term debt ratio and profitability

<table>
<thead>
<tr>
<th>Endogenous variables (SDR ROE), lags(1/5), exogenous variables (RISK SIZE LnRGDP INF LnRIR LnREER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample: 2000 – 2012</td>
</tr>
<tr>
<td>Log likelihood = 819.8404</td>
</tr>
<tr>
<td>FPE = 0.6834</td>
</tr>
<tr>
<td>Det(Sigma_ml) = 0.5668</td>
</tr>
<tr>
<td>No. of obs = 321</td>
</tr>
<tr>
<td>Log likelihood = -819.8404</td>
</tr>
<tr>
<td>FPE = 0.6834</td>
</tr>
<tr>
<td>Det(Sigma_ml) = 0.5668</td>
</tr>
<tr>
<td>No. of obs = 321</td>
</tr>
<tr>
<td>Log likelihood = -819.8404</td>
</tr>
<tr>
<td>FPE = 0.6834</td>
</tr>
<tr>
<td>Det(Sigma_ml) = 0.5668</td>
</tr>
<tr>
<td>No. of obs = 321</td>
</tr>
</tbody>
</table>

| Equation |Parms| RMSE| R-sq| chi2| P>|chi2|
|----------|-----|-----|-----|-----|--------|
| SDR      | 17  | 0.2060|0.6087|497.8195|0.0000  |
| ROE      | 17  | 3.724|0.0939|33.17757|0.0070  |

<table>
<thead>
<tr>
<th>SDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
</tr>
<tr>
<td>Std. Err.</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>P&gt;</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>L1 0.7678 0.0675 11.36 0.000***</td>
</tr>
<tr>
<td>L2 -0.1340 0.1013 -1.38 0.167</td>
</tr>
<tr>
<td>L3 0.0114 0.1047 0.11 0.913</td>
</tr>
<tr>
<td>L4 0.1418 0.1061 1.34 0.182</td>
</tr>
<tr>
<td>L5 -0.0890 0.0864 -1.03 0.303</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
</tr>
<tr>
<td>Std. Err.</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>P&gt;</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>L1 -0.0113 0.0030 -3.72 0.000***</td>
</tr>
<tr>
<td>L2 -0.0168 0.0031 -5.39 0.000***</td>
</tr>
<tr>
<td>L3 -0.0569 0.0023 -8.03 0.000***</td>
</tr>
<tr>
<td>L4 -0.0055 0.0403 -0.84 0.399</td>
</tr>
<tr>
<td>L5 -0.0292 0.0620 -4.32 0.000***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
</tr>
<tr>
<td>Std. Err.</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>P&gt;</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>0.0054 0.0027 2.01 0.044**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
</tr>
<tr>
<td>Std. Err.</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>P&gt;</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>0.0095 0.0020 4.71 0.000***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LnRGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coef.</td>
</tr>
<tr>
<td>Std. Err.</td>
</tr>
<tr>
<td>Z</td>
</tr>
<tr>
<td>P&gt;</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>0.0058 0.0023 2.48 0.013**</td>
</tr>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>INF</td>
</tr>
<tr>
<td>LnRIR</td>
</tr>
<tr>
<td>LnREER</td>
</tr>
<tr>
<td>Constant</td>
</tr>
</tbody>
</table>

ROE

<table>
<thead>
<tr>
<th>SDR</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>0.5835</td>
<td>1.2214</td>
<td>-0.48</td>
<td>0.633</td>
</tr>
<tr>
<td>L2</td>
<td>3.1056</td>
<td>1.8305</td>
<td>1.70</td>
<td>0.090*</td>
</tr>
<tr>
<td>L3</td>
<td>1.7416</td>
<td>1.8931</td>
<td>0.92</td>
<td>0.358</td>
</tr>
<tr>
<td>L4</td>
<td>-7.4850</td>
<td>1.9184</td>
<td>-3.90</td>
<td>0.000***</td>
</tr>
<tr>
<td>L5</td>
<td>3.8750</td>
<td>1.5615</td>
<td>2.48</td>
<td>0.013***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROE</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>0.0381</td>
<td>0.0550</td>
<td>0.69</td>
<td>0.488</td>
</tr>
<tr>
<td>L2</td>
<td>0.1865</td>
<td>0.0561</td>
<td>3.32</td>
<td>0.001***</td>
</tr>
<tr>
<td>L3</td>
<td>0.0546</td>
<td>0.1281</td>
<td>0.43</td>
<td>0.670</td>
</tr>
<tr>
<td>L4</td>
<td>-0.1695</td>
<td>0.1170</td>
<td>-1.45</td>
<td>0.147</td>
</tr>
<tr>
<td>L5</td>
<td>-0.0068</td>
<td>0.1222</td>
<td>-0.06</td>
<td>0.956</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RISK</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>-0.0118</td>
<td>0.0364</td>
<td>-0.33</td>
<td>0.745</td>
</tr>
<tr>
<td>LnRGDP</td>
<td>-0.0223</td>
<td>0.0420</td>
<td>-0.53</td>
<td>0.595</td>
</tr>
<tr>
<td>INF</td>
<td>1.7001</td>
<td>7.3088</td>
<td>0.23</td>
<td>0.816</td>
</tr>
<tr>
<td>LnRIR</td>
<td>-0.2170</td>
<td>1.1202</td>
<td>-0.19</td>
<td>0.846</td>
</tr>
<tr>
<td>LnREER</td>
<td>-1.3222</td>
<td>1.0336</td>
<td>-1.28</td>
<td>0.201</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.1608</td>
<td>2.1132</td>
<td>-0.08</td>
<td>0.939</td>
</tr>
</tbody>
</table>

Source: Computation from research data, 2014. *= 10% significance level, **=5% significance level and ***=1% significance level.

Not surprisingly, all the lags of return on equity except lag four has a significant negative relationship with short-term debt financing which means firms employ less of short-term debt instruments with increased profitability in line with Myers and Majluf’s (1984) pecking order theory and contrary to Jensen’s (1987) free cash flow theory of capital structure. From empirics this finding follows suit the study of Al-Taani (2013), who examined the relationship between capital structure and firm performance of Jordanian manufacturing firms and several other studies such as Rajan and Zingales (1995), Delcoure (2007) etc. Real GDP has a significant positive relationship with short-term debt implying that firms employ more of short-term debt in their capital structure as real GDP increases. This is in line with
the study of Bokpin (2009), who examined the impact of macroeconomic indicators on
capital structure decisions but goes contrast with the findings of Muthama et al. (2013) who
found a significant negative relationship examining the impact of macroeconomic indicators
on capital structure decisions among listed firms in Kenya. Our results also show that there
is a positive and statistically significant association between risk and short-term debt ratio.
This implies that the more volatile the earnings of a firm, the more they resort to debt of
short-term nature in their financing. This evidence renders authority to the trade-off theory of
capital structure.

Size measured as the natural log of a firm’s assets has a statistically significant positive
relationship with short-term debt following suit the traditional pecking order theory as larger
firms incur less adverse selection cost. Real effective exchange rates also has a significantly
negative relationship with short-term debt ratio in line with Abzarli et al. (2002). This means
that as the Ghana cedi depreciates against the weighted average, firms employ more of short-
term debt in their financing. Inflation has a positive but statistically insignificant relationship
with short term debt ratio, which implies that as the general prices of goods and services
measured by the percentage change in consumer price index increases, firms employ less of
short-term debt in their finance. This is in contrast with the findings of Bokpin (2009),
Abzarli et al. (2012) and Muthama et al. (2013). Bokpin (2009) observed a negative
statistically insignificant relationship between inflation and all the different measures of
capital structure considered in His study.

Size, real GDP, real interest rates and real exchange rates have a negative relationship with
return on equity, whiles risk and inflation have a positive relationship with return on equity.
However, they are all insignificant statistically.
4.5.3 Macroeconomic indicators, long-term debt ratio and profitability.

Considering the third model specified, which examines the impact of macroeconomic indicators and firm-specific factors controlled for, on the long-term debt financing of firms, both regression equations (long-term debt ratio and return on equity) have an R-square of 46.42% and 4.16% respectively implying that 46.42% and 4.16% changes in long-term debt and return on equity is jointly accounted for by their respective independent variables. Also a recorded P-value of 0.000 for equation one and 0.004 for equation two means jointly, the regressors in both equations have a statistically significant relationship with their regressands at 1%.

Table 4.7: Macroeconomic indicators, long-term debt ratio and profitability

| Endogenous variables (LDR ROE), lags(1/2), exogenous variables (RISK SIZE LnRGDP INF LnRIR LnREER) |
| Sample: 2000 – 2012 | No. of obs = 321 |
| Log likelihood = -843.1118 | AIC = 5.4820 |
| FPE = 0.6834 | HQIC = 5.6418 |
| Det(Sigma_ml) = 0.5668 | SBIC = 5.8823 |

| Equation | Parms | RMSE | R-sq | chi2 | P>|chi2 |
|----------|-------|------|------|------|--------|
| LDR      | 11    | 0.1180 | 0.4642 | 279.7922 | 0.000 |
| ROE      | 11    | 3.7566 | 0.0416 | 25.78542 | 0.004 |

| LDR     | Coef. | Std. Err. | Z     | P>|z| |
|---------|-------|-----------|------|------|
| L1      | 0.6062 | 0.0685    | 8.85 | 0.000*** |
| L2      | 0.0383 | 0.0866    | 0.44 | 0.658 |

| ROE     | Coef. | Std. Err. | Z     | P>|z| |
|---------|-------|-----------|------|------|
| L1      | -0.0186 | 0.0017    | -1.08 | 0.280 |
| L2      | -0.0007 | 0.0016    | -0.44 | 0.660 |

| RISK    | -0.0046 | 0.0015    | 3.53 | 0.002** |
| SIZE    | 0.0038 | 0.0011    | 1.74 | 0.000** |
| LnRGDP  | 0.0023 | 0.0013    | 0.25 | 0.082* |
| INF     | 0.6146 | 0.2284    | -0.48 | 0.804 |
| LnRIR   | -0.1470 | 0.0352    | 0.55 | 0.633 |
| LnREER  | 0.4492 | 0.0333    | -1.51 | 0.125 |
| Constant| -0.3400 | 0.0660    | 3.53 | 0.131 |

64
<table>
<thead>
<tr>
<th></th>
<th>ROE</th>
<th>LDR</th>
<th>L1</th>
<th>2.1552</th>
<th>-0.46</th>
<th>0.648</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2</td>
<td>2.7227</td>
<td>-1.90</td>
<td>0.057</td>
</tr>
<tr>
<td>ROE</td>
<td></td>
<td></td>
<td>L1</td>
<td>-0.9851</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L2</td>
<td>-5.1790</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-1.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RISK</td>
<td>0.0201</td>
<td>0.0475</td>
<td>0.42</td>
<td></td>
<td>0.672</td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>0.0076</td>
<td>0.0337</td>
<td>0.23</td>
<td></td>
<td>0.821</td>
<td></td>
</tr>
<tr>
<td>LnRGDP</td>
<td>-0.0290</td>
<td>0.0421</td>
<td>-0.69</td>
<td></td>
<td>0.491</td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>1.3602</td>
<td>7.1846</td>
<td>0.19</td>
<td></td>
<td>0.850</td>
<td></td>
</tr>
<tr>
<td>LnRIR</td>
<td>-0.2417</td>
<td>1.1080</td>
<td>-0.22</td>
<td></td>
<td>0.827</td>
<td></td>
</tr>
<tr>
<td>LnREER</td>
<td>-0.7089</td>
<td>1.0483</td>
<td>-0.68</td>
<td></td>
<td>0.499</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.3878</td>
<td>2.0754</td>
<td>0.19</td>
<td></td>
<td>0.852</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Computation from research data 2014. *= 10% significance level, **=5% significance level and ***=1% significance level.

Again from table 4.7, with the exception of the first lag of long-term debt ratio which has a significant positive relationship with its current value in line with Jong et al. (2008), the relationship between the lags of both long-term debt ratio and return on equity are not significant. Risk and size are observed to have a negative and positive statistically significant relationship respectively with long-term debt ratio. This implies that more risky firms employ less long-term debt following suit the findings of Jong et al. (2008), who studied the impact of firm and country specific variables on capital structure. Also larger firms employ more of long-term debt in their financing structure. Real GDP has a significant positive relationship with long-term debt. This implies that, as real GDP increases, firms employ more of long-term debt instruments like bonds and debentures as against equity in their financing following suit the findings of Muthama et al. (2013).

Inflation and real effective exchange rate are observed to have a positive relationship with long-term debt ratio whiles real interest rates and long-term debt ratio are positively linearly relative. However, the linear relationship between these variables and long-term debt ratio is
The positive insignificant relationship between real effective exchange rate and long-term debt goes contrary to the findings of Dong (2011) who examined a negative insignificant relationship between foreign exchange rate and capital structure decisions of New Zealand Listed Property Trusts.

On the effect of macroeconomic conditions and firms specific variables on the profitability of firms, it is observed that with the exception of the second lag of long-term debt ratio which has a significant positive relationship with return on equity, all the other macroeconomic variables and firm specific variables controlled for do not have any significant relationship with return on equity.

4.6 The impact of macroeconomic indicators and firm-specific effects on the different measures of capital structure.

This section examine whether the impact of macroeconomic indicators on capital structure decisions of firms will vary in terms of the sign (direction) and significance with the different capital structure measures.

Table 4.8: The impact of macroeconomic indicators and firm-specific effects on the different measures of capital structure.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Total debt ratio</th>
<th>Short-term debt ratio</th>
<th>Long-term debt ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on equity</td>
<td>Negative (-)</td>
<td>Negative (-)</td>
<td>Negative (-)</td>
</tr>
<tr>
<td>Risk</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
<td>Negative (-)</td>
</tr>
<tr>
<td>Size</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
</tr>
<tr>
<td>Natural log of real GDP</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
</tr>
<tr>
<td>Inflation</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
</tr>
<tr>
<td>Natural log of real interest rates</td>
<td>Negative (-)</td>
<td>Negative (-)</td>
<td>Negative (-)</td>
</tr>
<tr>
<td>Natural log of real effective exchange rates</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
<td>Positive (+)</td>
</tr>
</tbody>
</table>
Table 4.8 presents a summary of the sign and significance of all the independent variables as against the three measures of capital structure employed. It is observed that apart from risk, a measure of the volatility of earnings of a firm which has a positive relation with total debt ratio and short-term debt ratio but a negative relationship with long-term debt ratio, the sign of the impact of all the independent variables do not change with all the different measures of capital structure namely total debt ratio, short-term debt ratio and long-term debt ratio.

Contrary to the findings of Amidu (2007), Bokpin (2009) and Al-najjar and Hussainey (2011), who posit from their study that changing the definition of capital structure has an influential effect on the sign or the direction of the relationship it has with its drivers, the findings from this study suggests the reverse. Therefore as a response to the second objective of the study, it can be concluded from this findings that, the impact of macroeconomic indicators on capital structure decisions do not vary in terms of direction with the different measures of capital structure employed.

On the significance of the relationships, with red-coloured indicating significant and black-coloured indicating insignificant relationship, an opposite observation is made. This follows suit the findings of Al-najjar and Hussainey (2011) who observed that changing the definition of capital structure changes the significance of the drivers of capital structure as the significance of the relationship changes for risk, real interest rate and real effective exchange rate as the definition of capital structure changes although it does not change with return on equity, size, real GDP and inflation.

4.7 The causal relationship between the capital structure measures (debt ratio, short-term debt ratio and long-term debt ratio) and profitability

After estimation of the PVARX models, the fourth objective of the study is to explore the causal relationship between profitability and the different measures of capital structure
namely debt ratio, short-term debt ratio and long-term debt ratio over their common history.

As PVARX do not make a priori assumption on the direction of causality in a regression as
imposed in a normal regression, this objective is achieved by employing the Granger
causality test as developed by Granger (1969) on the outputs of the three PVARX models.

The Granger causality as explained in chapter three of the study operates as follows; a
variable Z is said to be Granger-caused by another variable X if Z can be predicted more
efficiently when the information on the past and present values of X is taken into account
than when it is not in addition to all other available information. Table 4.8 presents the
granger causality tests from the PVARX output for the three models.

Table 4.9 Granger causality Wald tests

<table>
<thead>
<tr>
<th>Equation</th>
<th>Excluded</th>
<th>chi2</th>
<th>df</th>
<th>Prob &gt;chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR</td>
<td>ROE</td>
<td>75.557</td>
<td>5</td>
<td>0.000</td>
</tr>
<tr>
<td>DR</td>
<td>ALL</td>
<td>75.557</td>
<td>5</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>DR</td>
<td>9.8671</td>
<td>5</td>
<td>0.079</td>
</tr>
<tr>
<td>ROE</td>
<td>ALL</td>
<td>9.8671</td>
<td>5</td>
<td>0.079</td>
</tr>
<tr>
<td>SDR</td>
<td>ROE</td>
<td>110.11</td>
<td>5</td>
<td>0.000</td>
</tr>
<tr>
<td>SDR</td>
<td>ALL</td>
<td>110.11</td>
<td>5</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>SDR</td>
<td>18.283</td>
<td>5</td>
<td>0.003</td>
</tr>
<tr>
<td>ROE</td>
<td>ALL</td>
<td>18.283</td>
<td>5</td>
<td>0.003</td>
</tr>
<tr>
<td>LDR</td>
<td>ROE</td>
<td>1.2597</td>
<td>2</td>
<td>0.533</td>
</tr>
<tr>
<td>LDR</td>
<td>ALL</td>
<td>1.2597</td>
<td>2</td>
<td>0.533</td>
</tr>
<tr>
<td>ROE</td>
<td>LDR</td>
<td>12.866</td>
<td>2</td>
<td>0.002</td>
</tr>
<tr>
<td>ROE</td>
<td>ALL</td>
<td>12.866</td>
<td>2</td>
<td>0.002</td>
</tr>
</tbody>
</table>
Considering the first model for the study, it is observed that causality flows from return on equity to total debt ratio at 1% significance level evidenced by the p-value of 0.000. This is consistent with the study of Rajan and Zingales (1995), who examined the capital structure discussed in G7 countries and observed that profitability has a negative causal effect on a firm’s capital structure. On the other hand, total debt ratio is observed to have a causal effect on profitability at 10% significance level as evidenced by a p-value of 0.079. This follows suit the agency cost theory of capital structure proposed by Jensen and Meckling (1976), which posits that as firms employ more debt as against equity, the value of a firm increases as a result of the reduction of the agency cost of outside equity which compels managers by constraining or encouraging them to act more in the interest of equity holders. Therefore, capital structure is deemed to have an impact on a firm’s performance. This implies that, the causal relationship between total debt ratio and return on equity is bi-directional flowing from return on equity to total debt ratio and also from total debt ratio to return on equity. This follows suit the study of Berger and Bonaccorsi di Patti (2006) who tested the agency costs theory hypothesis by using profit efficiency as an indicator of firm performance and by employing a simultaneous-equation model that accounts for reverse causality between firm performance and capital structure.

Considering the second model for the study, it is observed that causality flows from return on equity to short-term debt ratio and from short-term debt ratio to return on equity at 1% significance level as evidenced by their respective p-values of 0.000 and 0.003. Causality flowing from short-term debt ratio to return on equity a proxy for profitability is in line with Abor (2005) who examined the effect of capital structure on profitability of listed firms in Ghana. He observed that there is a significant relationship between the ratio of short-term debt to total assets and return on equity. This findings also gives credence to the study of Berger and Bonaccorsi di Patti (2006).
Long-term debt ratio is observed to have a causal effect on return on equity while no such causal effect is observed in the opposite direction as evidenced by their respective p-values of 0.002 and 0.533 respectively. The causal effect through long-term debt ratio to profitability is in line with the famous agency theory as proposed by Jensen and Meckling (1976), the study of Abor (2005) and Khalaf (2013). This implies that the causal relationship between long-term debt ratio and return on equity is uni-directional contrary to that of total debt ratio and short-term debt ratio which are all bi-directional or have a feedback effect.

4.8 Post-estimation Robustness checks

After estimation of the PVARX model, it is imperative to conduct a post-estimation check to justify the reliability of the parameter estimates. These checks are the normality test of the residuals and a check of the stability condition of the PVAR estimates. After estimation one can conduct these test based on the PVAR output generated.

4.8.1 Test for normally distributed disturbances.

Generating a reliable and consistent estimates require that the residuals in the regression follows a normal distribution and that the models are not misspecified. Non-normality can distort the sign of the co-efficient generated from the PVARX output as well as their significance. We therefore conduct a post-estimation normality test on the PVAR output against the null hypothesis that the disturbances for each equation forming the PVARX system and for all equations jointly are normally distributed and an alternative hypothesis that states that they are not normally distributed. Failure to reject the null hypothesis indicates a lack of model misspecification and the reverse holds for rejection of the null hypothesis. We conduct this test using three test statistics namely; Jarque–Bera statistic, skewness statistic and the kurtosis statistic. The Jarque–Bera results use the sum of the skewness and kurtosis statistics whiles the skewness and kurtosis results are based on the
skewness and kurtosis coefficients respectively. All the three test statistics are reported on the three PVARX models estimated as illustrated by tables 4.9, 4.10 and 4.11 respectively.

Table 4.10: Model One (1)

<table>
<thead>
<tr>
<th>EQUATION</th>
<th>JARQUE-BERA</th>
<th>SKEWNESS (S)</th>
<th>KURTOSIS (K)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chi2</td>
<td>df</td>
<td>P-value</td>
</tr>
<tr>
<td>DR</td>
<td>2329.388</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>4.8e+05</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ALL</td>
<td>4.9e+05</td>
<td>4</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 4.11: Model Two (2)

<table>
<thead>
<tr>
<th>EQUATION</th>
<th>JARQUE-BERA</th>
<th>SKEWNESS (S)</th>
<th>KURTOSIS (K)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chi2</td>
<td>df</td>
<td>P-value</td>
</tr>
<tr>
<td>SDR</td>
<td>2819.284</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>4.4e+05</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ALL</td>
<td>4.5e+05</td>
<td>4</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 4.12: Model Three (3)

<table>
<thead>
<tr>
<th>EQUATION</th>
<th>JARQUE-BERA</th>
<th>SKEWNESS (S)</th>
<th>KURTOSIS (K)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chi2</td>
<td>df</td>
<td>P-value</td>
</tr>
<tr>
<td>LDR</td>
<td>1.4e+04</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ROE</td>
<td>3.8e+05</td>
<td>2</td>
<td>0.000</td>
</tr>
<tr>
<td>ALL</td>
<td>3.9e+05</td>
<td>4</td>
<td>0.000</td>
</tr>
</tbody>
</table>
From table 4.9, it is observed that for each equation, that is debt ratio equation and return on equity equation and also for all the equations jointly in the PVARX system one (1), the probability value for all the three test statistics is statistically significant at 1 % (p-value < 0.01). Therefore we refuse to reject the null hypothesis that the disturbances in the PVARX model one (1) are normally distributed hence the lack of misspecification. A similar observation is made from the output of models two (2) and three (3) as illustrated by table 4.11 and 4.12 respectively. Therefore we conclude that in general the residuals in the three PVARX models estimated are normally distributed hence there is no problem of model misspecification.

4.8.2 PVARX stability condition

To generate consistent and reliable estimates from a PVAR, the PVAR model is required to be stable. Interpretation of PVAR models requires that an even stricter stability condition be met. If a PVAR model is stable, it is invertible and has an infinite-order vector moving-average representation. If it is stable, granger causality tests, impulse–response functions and forecast-error variance decompositions have known interpretations. It is therefore of essence to check the eigenvalue stability condition of the three models. PVAR estimates satisfy the stability condition or is stable if the modulus of each eigenvalues of the companion matrix is less than one. This condition is the vector extension to the stationarity condition requires that the roots of an autoregressive polynomial of a single variable lie inside the unit circle. To provide a visual and clearer view of the tests, we present the graph of the eigenvalues of the companion matrix of all the three estimated models. The graph present the eigenvalues with the real components on the x-axis and the complex components on the y-axis. Figure 4.1, 4.2 and 4.3 presents the graph of the results from the three models respectively.
From figure 4.2, it is observed that for the first model with the lowest and highest being 0.586 and 0.877 respectively, the modulus of each eigenvalue is strictly less than one and also they all fall within the unit circle. This means that model one which considers macroeconomic conditions, total debt ratio and profitability is stable and hence satisfies the PVARX stability condition. Therefore the estimates generated from the model are reliable, and there is no problem of model misspecification, hence, the interpretations made from them are meaningful.
From figure 4.3, it is evident that for the second model with the lowest and highest values being 0.104 and 0.948 respectively, the modulus of each eigenvalue is strictly less than one and all fall within the unit circle. This means that model two which considers macroeconomic conditions, short-term debt ratio and profitability is stable and hence satisfies the PVARX stability condition suggesting reliable estimates and meaningful result.
From figure 4.3 it is evident that for the third model which considers macroeconomic conditions long-term debt ratio and profitability, with the lowest and highest values being 0.104 and 0.948 respectively, the modulus of each eigenvalue is strictly less than one and all fall within the unit circle. This means that similar to model one and two, model three is stable and hence satisfies the PVAR stability condition suggesting reliable estimates and hence meaningful interpretations.
4.9 Conclusions

This chapter details the analysis and discussion of findings of the study. First a panel unit root test is conducted to ascertain the stationary or otherwise of the variables for the study. It was observed that all variables were stationary at levels or integration to the order one, implying the absence of unit roots. Subsection 4.3 detailed the selection of the optimal lag length for the estimation of the PVARX models. The output from the estimation of the three models specified for the study is analysed in subsection 4.4. To achieve the third objective of the study which is to examine whether the impact of macroeconomic indicators on capital structure will vary in terms of the sign and significance changing the definition of capital structure, subsection 4.5 illustrates the summarised results in a tabular representation. An observation made is whiles the direction of the relationship does not change, the significance changes. Subsection 4.6 considers the causal relationship between the different measures of capital structure and profitability. It is observed that whiles the causal relationship between profitability and both total debt ratio and short-term debt ratio is bi-directional that is having a feedback effect, the relationship between profitability and long-term debt ratio is uni-directional flowing form long-term debt ratio to return on equity with no feedback effect.

Finally to establish the reliability and consistency of the estimates as well as the lack of model misspecification, we conduct a post estimation check on the output of the PVARX models estimated and not on the data. We observe from the test of normality and stability condition of the PVARX estimates that indeed there is lack of model misspecification, hence, the estimates generated are reliable and consistent suggesting a meaningful results. The chapter is concluded in this subsection, subsection 4.8. Summary, conclusions and recommendations proceeds this chapter.
CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter presents a summary of the entire study and concludes on macroeconomic indicators, capital structure decisions and profitability. The chapter as well makes necessary recommendations for policy implementation, practitioners in corporate finance as well as the future research directions for academia. The chapter also discusses some limitations of the study.

5.2 Summary
Over the last years, experiential studies into the determinants and determination of capital structure of firms have been predominant in the United States and other developed countries (Modigliani & Miller, 1958: 1963; Myers, 1977; Titman & Wessels, 1988; Rajan & Zingales, 1995). Moreover most of these studies have focused on the effect of micro factors at the firm and industry levels (Harris & Raviv, 1991; Titman & Wessels, 1988; Rajan & Zingales, 1995; Ozkan, 2001; Huang & Song, 2006; Korajczyk & Levy, 2000) at the expense of macro factors such as the macro-wide economic indicators. However, few research work carried out on the impact of macroeconomic indicators on capital structure of firms are in the context of developed economies and or in a cross-country context and not much at the developing economy and or single-country or firm level context. Moreover, the results obtained from these studies are varying and hence inconclusive, necessitating the need for a single country study in a developing economy. It is against this background that the study examines this phenomenon in the context of single country Ghana, a developing economy with different institutional, political and economic framework.
The study was undertaken to achieve the following objectives; firstly to examine the composition of capital structure employed by non-financial firms. Secondly, to examine the impact of macroeconomic indicators on capital structure decisions. The third objective is to investigate that if macroeconomic indicators have an impact on capital structure, this impact will vary with the different measures of capital structure (total debt ratio, short-term debt ratio and long-term debt ratio). The last objective is to explore the causal relationship between profitability and these different measure of capital structure.

The study uses a quantitative research approach and a panel data methodology due to the panel nature of the data. Specifically the study employs a Panel Vector Autoregression (PVAR) estimation technique, which is estimating a VAR model using a panel data. The study employs this estimation technique to first of all test how stable the parameter estimates are across firms, secondly to solve the problem of endogeneity specifically reverse causality between profitability and the measures of capital structure. The last and more important reason is to achieve the fourth objective of the study which is to examine the causal relationship between profitability and the different measures of capital structure. The dependent variables for the study include, total debt ratio, short-term debt ratio and long-term debt ratio. With the independent variables, the macroeconomic variables considered includes real gross domestic products, real interest rates, real effective exchange rates and inflation. Risk, size and return on equity, a proxy for profitability of firms are included in the model as control variables. This is to account for firm-specific fundamentals that inform financing decisions and more importantly to minimise problems of misspecification.

Considering twenty-seven (27) non-financial firms listed on the GSE from 2000 to 2012, the study made the following observations. As a percentage of total capital, it is observed that total equity, long-term debt and short-term debt forms 38%, 18% and 44% respectively. This implies that long-term debt is an unpopular source of debt financing for non-financial firms
listed on the exchange with short term being the most popular source. This could be as a result of the under-developed nature of the bond market in Ghana.

From the three PVARX models estimated, not surprisingly, profitability is observed to have a significant negative relationship with all the three measures of capital structure suggesting that more profitable firms employ less of debt be it short-term or long-term in their financing. This findings is in sync with the pecking order theory of capital structure and stark contrast to the free cash flow theory. Empirically, it is in line with the study of Al-Taani (2013).

Risk is observed to have a positive but a significant and insignificant relationship with total debt ratio and short-term debt ratio respectively whiles a negative significant relationship is observed for long-term debt ratio. This implies that the more volatile the earnings of a firm, the more it employs total debt and short-term debt but the less it employs debt of long-term duration. This finding for short-term debt and total debt is in line with Cekrezi (2013) but contrary to that of Bokpin (2009) whiles that of long-term debt follows suit the findings of Jong et al. (2013).

Real GDP was observed to have a positive significant relationship with all the measures of capital structure, this implies that as the real GDP of the Ghanaian economy increases non-financial firms listed on the exchange employ more of debt be it short-term and long-term in their capital structure. The positive significant relationship for total debt ratio is in line with Cekrezi (2013) whiles that of short-term debt is in line with Bokpin (2009) and contrary to Muthama et al. (2013). The findings of Muthama et al. (2013) renders credence to that of long-term debt ratio.

In line with the conjecture that a firm is likely to employ more of debt instruments under inflationary periods since inflation not only decrease the real value of debt but also increase
the real tax advantage of debt (Taggart, 1985; Frank & Goyal, 2009; Lemma & Negash, 2013), we find a positive association between inflation and all the different measures of capital structure. This positive association however, is statistically insignificant.

Real interest rate is also observed to have negative relationship with all the three measures of capital structure. Its relationship with total debt is statistically significant indicating that non-financial firms on the exchange employ less of debt be it short-term or long-term as interest rates increases. A positive and statistically significant relationship is observed between real exchange rates and total debt ratio as well as short-term debt ratio. However, its relationship with long-term debt ratio is insignificant.

On the third objective of the study, it is observed that the impact of macroeconomic indicators on capital structure decisions do not change with respect to the different measures of capital structure in terms of the direction of the relationship. This is contrary to the findings of Amidu (2007), Bokpin (2009) and Al-Najjar and Hussainey (2011). However, it changes with respect to the statistical significance giving authority to the proposition made by Al-Najjar and Hussainey (2011).

Exploring the causal relationship between profitability and the different measures of capital structure, it is observed that, while the causal relationship between the total debt ratio and short-term debt ratio is bi-directional, that is having a feedback effect, the relationship between long-term debt ratio and profitability is uni-directional flowing form long-term debt ratio to return on equity with no feedback effect. The results from the feedback effect between profitability and total debt ratio, as well as with short-term debt ratio gives credence to the study of Berger and Bonaccorsi di Patti (2006). The uni-directional causality flowing from long-term debt ratio to profitability renders authority to the famous agency theory of capital structure proposed by Jensen and Meckling (1976).
5.3 Conclusions of the study

The numerous literature on capital structure decision suggest that capital structure of a firm lies at the very heart of corporate financial decisions. In line with extant literature, the study observes that, although firm and industry specific fundamentals are important determinants of capital structure decisions, macroeconomic variables are also very important and have influential effect on capital structure decisions, and hence cannot be overlooked. The order of importance of these macroeconomic variables is as follows; Gross Domestic Product, exchange rates, interest rates and inflation.

In addition, changing the definition of the capital structure of a firm might not necessarily change the direction of the relationship it has with the potential drivers but can lead to changes in the significance of the relationship.

Our results also reveal that, not only does the profit position of a firm has an influential effect on the amounts of total debt or short-term debt employed by a firm in its capital structure but then both total debt and long-term debt has an influential effect on profitability. However evidence contrary to this is observed for long-term debt, as long-term debt has an effect on the profit generating ability of a firm but not the reverse. This can be due to the unpopular stance of long-term debt as against short-term debt on the Ghanaian financial market.

5.4 Scope and limitations of the study

Notwithstanding the contributions that this study attempts to make, some circumspection or caution should be acknowledged in the interpretation of the results. Taking cue from most empirical research, the study as stated earlier considers non-financial firms listed on the GSE. The decision to consider only listed firms is guided by two reasons. First, financial reports of listed firms tends to be more credible than those of non-listed firms, as the latter in
most cases might not have to adhere to the strict financial reporting requirements required of the former. Second, the lack of data availability on non-listed firms meant that we restrict our analysis to listed firms. Quiet unfortunately the research cannot capture other firms which are not listed on the Ghana stock exchange. This may affect generalisations of this work for all firms in Ghana and in other developing countries since the results from this research may be biased towards listed non-financial firms. Finally the reliance on secondary data which is collected from the Ghana Stock Exchange means that the study suffers from the limitations associated with the preparation of annual financial statements.

5.5 Recommendations for policy, practice and academia

The empirical evidence documented in this study has a number of implications for policy makers and regulators at the macro level, for practitioners in the professional world of corporate finance especially for managers and decisions makers, and for researchers in the academic spectrum.

For policy makers and regulators, evidence from the study suggests that, they could influence the capital structure decisions of firms and hence profitability through the formulation of macroeconomic policies and regulations. Therefore, the fiscal and monetary policies of the government should be geared towards creating a conducive environment for firms to make informed financing decisions. The government’s fiscal and monetary policies should focus on creating conducive environment which is more stable and healthy. These policies, however, must be designed to improve the macroeconomic environment in general rather than specific sectors since there is complementarity among these macroeconomic fundamentals. In addition, Government of Ghana should improve the bond market in Ghana in order to improve long-term external sources of funding. This will reduce the over-reliance of firms on short-term debt financing and equity.
To practitioners, findings from this research provide the credible level of evidence that the macroeconomic fundamentals in an economy plays a critical role in their financing decisions. The study therefore suggests that corporate financial managers in making their capital structure decisions should not only consider their firm or industry level factors. They should pay close attention to the developments in the macroeconomic fundamentals especially the trends in GDP as they do not exist in solitary confinement. The study also suggests that not only do profit levels affect their decisions on debt-equity mix but also the latter affects the former. Therefore managers of firms should treat both capital structure decisions and their profitability concerns as matters of equal importance.

Finally to academia and the world of research, given that the constants in the PVARX models estimated were statistically significant in most cases, more studies are still needed in this area embracing more variables at the macro and micro levels. For macroeconomic variables they could consider capital market access, bank credit and monetary policy success. Asset tangibility, non-debt tax shield and dividend payout ratio are micro level variables worthy of consideration.

The study also suggests a further research on the macroeconomic influence and cost of capital on capital structure so as to provide holistic view on how macroeconomic factors affect the firms financing decisions. Since capital structure is one of the most controversial issues in corporate finance, there is the need for studies from different perspectives. Widening the scope of this study to cover all African countries and inculcating external factors such as political factors and institutional variables would be an immense contribution to global knowledge.
REFERENCES


Performance: Focusing on Consumers and Industrials Sectors on Malaysian Firms.  


of private equity and debt markets in the financial growth cycle. *Journal of Banking & Finance*, 22(6-8), 613-673.


sixteen European countries. The Aarhus School of Business Denmark. Unpublished

structure choice in UK SMEs: empirical evidence from company panel data. *Small

the risk of loss of control and the aversion to debt. *Entrepreneurial Theory and
Practice*, 23(4), 53-64.

Modigliani, F., and Miller, M.H. (1958). The cost of capital, corporation finance and the


Economic Influences on Corporate Capital Structure of Listed Companies in Kenya.

*Journal of Finance and Investment Analysis, 2(2), 41-62.*


Ozkan, A. (2001). Determinants of capital-structure and adjustment to long run target:


