UNIVERSITY OF GHANA

THE IMPACT OF DEBT MATURITY STRUCTURE ON RISK-ADJUSTED PROFITABILITY

BY

BUERKI GYEMFA PLAHAR

(10421510)

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DECLARATION

I, the undersigned do hereby declare that this work is the result of my own research and no part of it has been presented by anyone for any academic award in this or any other university. All references used in the work have been duly acknowledged.

…… ……

BUERKI GYEMFA PLAHAR **DATE**

(10421510)

CERTIFICATION

I certify that this long essay was supervised in accordance with the procedures and guidelines laid down by the University of Ghana.

…… ……

DR. CHARLES ANDOH **DATE**

(SUPERVISOR)

DEDICATION

This research work is dedicated to my parents, Professor Christina Nti and Professor Wisdom Annorsey Plahar, for their love and guidance throughout the years.

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ABSTRACT

The purpose of this research is to investigate the impact that debt maturity structure has on the risk-adjusted profitability of firms by assessing the effect of short-term, long-term and total debt on risk-adjusted profitability. The study also compares these effects for financial firms as against non-financial firms. The research uses data collected from the financial statements of 35 listed companies on the Ghana Stock Exchange. The data is analysed using panel regression, with fixed effects estimation models being used for the analysis of the total firms and financial firms, and random effects estimation for the non-financial firms.

The findings of the research indicated that short-term debt and total debt had a significant positive effect on risk-adjusted profitability for the total firms, as opposed to long-term debt, which had a significant negative impact. Comparing the findings for financial against non-financial firms, the results showed that short-term debt and total debt had a significant negative impact on risk-adjusted profitability for financial firms, while for non-financial firms, they had a significant positive effect. In the case of long-term debt, there was a significant positive impact for the financial firms and a significant negative impact for non-financial firms.

This study provides guidance for firms that are seeking to take on more leverage for their business operations. It guides financial and non-financial firms on the forms of debt that are more suitable for their operations, given the level of risk that is attributable to them. Also, the study has implications for policy, with the findings showing that financial firms need more rigorous risk management systems.

Keywords: *debt maturity structure, risk-adjusted profitability, risk, leverage, financial firms, non-financial firms*

CHAPTER ONE

INTRODUCTION

1.1 Research background

An important question that all companies inevitably have to ask themselves at one point or another in their profit-pursuing journey is this; 'how much debt should we take on?'. For these companies, the decision on the quantities of long-term and short-term debt to incur can be likened to walking on a tight-rope. The debt maturity structure of companies is an aspect of capital structure that zones in on the implications of the decision between long-term and short-term debt. Debt maturity structure can play a crucial part in reducing the cost of financing with debt, which may impact the value of the company (Ozkan, 2000). Piper & Weinhold (1982) note that greater dependence of firms on debt creates a positive relationship between sales and profits. Managers who can identify and utilise the most advantageous combinations of debt and equity benefit in the financial market since it reduces the company's cost of financing (Abor, 2007). As such, it is essential that the right levels of corporate debt are maintained in order for firms to efficiently maximize shareholder wealth, and to remain competitive within their respective industries.

Short-term debt indicates borrowing that typically matures in a year while long-term debt matures in over a year. The maturity structure of debt has different implications for different companies and exposes companies to very different types of risk. Further, companies with different sizes and characteristics experience these risks in varying ways. For instance, a study conducted by Hamada (1972) found that 21% to 24% of the systematic risks of common stocks could be related to the financial risk added on when a company uses preferred stock and leverage. Companies normally use short-term debt to support working capital requirements. Short-term debt has implications for

the liquidity of a company because it matures quickly and as such, will have to be renewed frequently. However, this exposes the company to interest rate fluctuations leading to liquidity and refinancing risk (Diamond, 1991). Long-term debt also exposes the company to solvency and collateral risks. Managers are therefore very concerned with finding the types of debt that are most suitable for their businesses in order to effectively manage the risks that they incur.

Over the years, there has been much debate on whether or not there is an optimal leverage level that a firm can take on in order to maximize its profits. Some are of the view that the optimum level of debt occurs at the level where the additional risks of financial distress are more than offset by the additional benefits from the tax shield afforded by the interest paid when financing with debt (Piper & Weinhold, 1982). Other studies have led to the realization that there is no specific point at which every company can reach an optimal level of debt. Abor (2005) notes that despite the interest in this area of study, the best that has been achieved by researchers and practitioners are recommendations for debt structure that address short-term goals. It is really an empirical issue on whether or not the debt-related costs are large enough to affect the costs of borrowing (Bradley, Jarrell, & Kim, 1984). Considering the lack of consistency and consensus in the views regarding debt structure and its implications, it is not surprising that it remains an interesting area of research that provides opportunities for several angles of debate and probing.

1.2 Research problem

For decades there has been much interest in the decisions of firms about capital structure. Many of the researches conducted on capital structure have centred on what the determinants of capital structure are in different countries (Forte, Barros, & Nakamura, 2013; Toumi & Dadene, 2014; Ngjeliu, 2018). In the Ghanaian context, there have been a few studies assessing the relationship between capital structure and performance (Abor, 2005). However, very few of these have focused

on the specific effect that debt policy alone can have on the profitability of companies (Abor, 2007).

Companies in Ghana employ slightly different types of debt than those popularly used in more developed countries. Sources of debt such as corporate bonds and credit card debt are not popularly used as a debt financing source in Ghana. This is due to the lack of adequate structures in place for trading corporate bonds as well as the non-existence of local rating agencies, which would provide credit ratings for the corporate bonds. However, a lot of the studies on debt structure, mainly situated in the context of more developed economies, have corporate bonds forming a significant part of the debt under scrutiny. This study seeks to customise the debt maturity structure and performance analysis to the sources of debt prevalent in Ghanaian companies in order to generate results that are useful within the Ghanaian context.

Further, the few studies in Ghana that have focused on debt policy have assessed the impact of debt policy on profitability without adequately touching on the importance of the implications of the risks incurred. Companies that take on more debt, whether short-term or long-term, are exposed to increased risks. A study in Pakistan considered the effect that short-term financing has on risk-adjusted profitability (Shah & Shah, 2017) and found that it had no effect on risk-adjusted profitability, which differs from the expected positive relationship it has with profitability. However, the study looked at short-term financing in terms of the working capital of the companies. A study by Abor, Sarpong-Kumankoma, Fiawoyife & Osei (2009) addressed the risk dimension of capital structure by assessing the impact of risk on financial policy, with the results showing that companies with higher business risk use less debt. Also, Bokpin, Aboagye & Osei (2010) sought to determine how listed firms would change their capital structure to respond to

exposures to risk on the Ghana Stock Exchange. However, neither of these studies considered the effect of capital structure on performance considering the amount of risk incurred by the company.

1.3 Research purpose

This study aims to address a gap in the literature by investigating the impact of the maturity structure of debt on the risk-adjusted profitability of companies in Ghana.

1.4 Research objectives

The specific objectives of the study are to;

- Determine the effect of short-term debt financing on risk-adjusted profitability.
- Determine the effect of long-term debt financing on risk-adjusted profitability.
- Determine the effect of total debt on risk-adjusted profitability.
- Compare the effects of short-term debt, long-term debt and total debt on risk-adjusted profitability for financial and non-financial firms.

1.5 Research hypotheses

- *H1*. Short-term debt has a negative impact on risk-adjusted profitability
- *H2*. Long-term debt has a negative impact on risk-adjusted profitability.
- *H3*. Total debt has a negative impact on risk-adjusted profitability.

1.6 Research questions

- What is the effect of short-term debt on risk-adjusted profitability?
- What is the effect of long-term debt on risk-adjusted profitability?
- What is the effect of total debt on risk-adjusted profitability?
- How do the effects of short-term, long-term and total debt on risk-adjusted profitability differ between financial and non-financial firms?

1.7 Scope and limitations of the study

The study assesses how the debt maturity structure of companies that are listed on the Ghana Stock Exchange affect risk-adjusted profitability.

Limitations of this study include that there is a limited time period to complete the study. The study is also only based on firms on the Ghana Stock Exchange due to the availability of published financial statements. Also, certain data points may be missing for some firms in certain periods.

1.8 Significance of the study

This study may help to inform businesses in making decisions on the levels of different forms of debt to employ considering the amount of risk that they have taken on. Also, there is a dearth of information on debt structure and profitability, although it is a popular method of financing in Ghana. This study may serve as a relevant contribution upon which researchers can build and expand.

The study may also have implications for policy. Government benefits in the form of taxes when businesses are profitable. The findings of the study may help the government in determining what types of policy to introduce in order to encourage or discourage certain forms of debt that may have an undesirable effect on the performance of firms, whether financial or non-financial.

1.9 Chapter disposition

Chapter one was the introduction of the research and included the background, problem, research objectives and questions, the scope and the limitations of the study, and the significance of the research.

Chapter two was the literature review chapter and involved a review of all relevant literature.

Chapter three represented the methodology of the study and outlined how the study was conducted. It highlighted the sources and types of data, the data collection methods, the tools and techniques used to analyse the data, and all relevant models and equations.

Chapter four looked at the results and discussions of the findings from analyzing the data.

Chapter five is the conclusion of the study. It summarised the work done and made recommendations based on the findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter synthesises and discusses the theories and existing research, as relevant to the research study. It highlights the theoretical underpinnings of the study, and also contains an empirical review of relevant literature and concepts upon which the study derives its foundations.

2.2 Conceptual review

2.2.1 Debt maturity structure

The maturity structure of debt considers the proportions of long-term debt and short-term debt that a firm employs in its capital structure. Long-term debt refers to debt that matures in a period greater than a year, while short-term debt matures in less than a year. The different maturity periods may have different effects on the organization and its operations.

2.2.2 Risk

Risk exists wherever there is some level of uncertainty. It has many different classifications such as economic risk, business risk, political risk, financial risk, credit risk, and many others. Indeed, any situation, the outcome of which is not known with absolute certainty, can give rise to a risk.

In this study, risk is defined as the likelihood of a company entering into financial distress. A company is seen to be financially distressed when it is consistently finding it difficult to meet its financial obligations. This can lead to the firm incurring certain costs including increasing cost of capital, cost of legal fees and even bankruptcy costs. Bankruptcy costs arise when persistent financial distress leads to the firm going bankrupt. The measure of the risk of encountering

financial distress used in this research is the Altman Z-score. This is discussed in more detail in the methodology.

2.3 Theoretical review

2.3.1 Modigliani and Miller Capital Structure Irrelevance Theory

It is rare for capital structure to be discussed without reference to the irrelevance propositions of capital structure by Modigliani & Miller (1958), which analysed the relationship between capital structure and value of a firm. It is widely regarded as the premier generally accepted theory on capital structure (Pagano, 2005). The theory proposes that assuming no taxes, bankruptcy costs, asymmetric information, transaction costs, and in the presence of efficient markets, the debt policy of a firm has no effect on its value. It also assumes that individuals can borrow at the same interest rates as firms. Modigliani & Miller (1958) outlined two basic propositions (hereafter referred to as Proposition I and Proposition II) that aimed to provide the basis upon which firms and shares may be valued.

Proposition I proposes that the debt policy of a firm does not matter because investors can design their own capital structure through their personal borrowing and how they structure their investment portfolio. Thus, they will not pay extra for a firm's shares based on their capital structure simply because they can borrow just as easily or cheaply on their own accounts, since there are assumed to be no transaction and agency costs (Brealey, Myers, & Allen, 2011). Proposition II also proposes that debt policy does not increase firm value because a rise in debt causes a rise in risk, and so investors will demand a higher required rate of return. The end result is that the increased return is offset by the increase in risk, and so investors will not see the need to reward a firm for the altered debt structure by paying more for their shares.

The irrelevance theory has faced some criticisms, largely based on the assumptions underlying the theory. In real life situations, perfect markets are rare and taxes, bankruptcy costs, information asymmetry and transaction costs are virtually unavoidable. Thus, it is a glaring flaw in the theory which limits its applicability to real-world situations. Stiglitz (1969) notes that in practice, it appears that borrowing rates for firms and individuals differ, which contradicts the assumptions of the theory, and also that bankruptcy costs do exist and can have severe adverse effects when leverage is excessive. It is worthy of note that the theory was intended to be basic and the foundation upon which theories on firm valuation can be developed (Modigliani & Miller, 1958).

Modigliani & Miller (1963) later modified the theory to add the impact of taxes. This consequently led to modifications in the propositions made. Proposition I evolved to show that the value of a levered firm is larger than the value of an unlevered firm by the amount of tax shield afforded by the tax-deductible interest payments on debt. Proposition II was also modified with additions being made to the original proposition. It stated that as more and more cheap debt replaces equity, it causes the weighted average cost of capital (WACC) will reduce. Thus, at 100% debt, the firm will be able to minimize the WACC and achieve an optimal capital structure. There is an obvious drawback in this theory in the sense that excessive debt has its problems. Pagano (2005) notes that reality differs from the Modigliani and Miller assumptions in several ways, including the existence of taxes, informational issues and bankruptcy costs, and these should be considered in the empirical analysis of decisions on capital structure.

2.3.2 Trade-off theory

This theory developed following the criticisms levelled against the irrelevance theory by Modigliani & Miller (1958). The beginnings of the trade-off theory were developed in a paper by Kraus & Litzenberger (1973) which proposed that an optimal debt level existed, representing a

trade-off between the tax shield offered by leverage and the bankruptcy costs of debt. The results revealed that a levered firm's value was equal to an unlevered firm's value plus the present value of the tax shield created by the leverage, and less the present value of bankruptcy costs from the debt. Scott (1976) noted that debt has value primarily because interest payments on debt are tax-deductible and is harmful to the extent that increasing the level of debt increases the likelihood of incurring bankruptcy costs. In line with this assertion, Dalci (2018) in a research on listed manufacturing companies in China demonstrated that debt had a two-sided effect on profitability where the positive effect is from the tax shield, and the negative effect is attributable to the costs related to financial distress, agency issues and information asymmetry that the firms suffer from, because of the nature of institutions in China.

Scott (1977) also built on trade-off theory, demonstrating that companies must target a debt ratio where the marginal benefit of the debt tax shield is balanced by the marginal cost of bankruptcy. He found that the theory was also more applicable for larger firms generating higher earnings. Similarly, Pettit & Singer (1985) found in their study that the theory applies to small firms to a lesser extent since they are unlikely to have large earnings. Bradley *et al.* (1984) document that when debt-related costs are significant, the incremental tax rate of the bondholder will be lower than the company rate and corporate debt financing will provide a tax advantage.

A number of researchers have sought to test the propositions of the trade-off theory. Fama & French (2002) document that the trade-off theory indicates that companies that have higher profitability have more debt, but their study found the opposite to be true. The firms with higher profitability had lower levels of leverage. Miller (1977) was a particularly harsh critic of the optimal debt level proposed by the trade-off model, pointing out that the leverage-related costs appear relatively small compared to the savings from the tax shield that they are meant to balance.

Thus, his argument was that bankruptcy of corporations are rare, and have low deadweight costs while taxes tend to be high for firms and so the resulting tax shield from debt is also higher.

2.3.3 Pecking order theory

Donaldson (1961) was the first to propose the pecking order theory, refuting the idea that an optimal capital structure existed. The theory proposes that firms follow a systematic preference order when deciding on their sources of finance. Donaldson (1961) postulates that firms will primarily prefer internally generated funds for financing investments before any other sources are considered, and that debt is preferred to equity. The pecking order theory became popularised by Myers & Majluf (1984), who posit that where there is asymmetric information, managers tend to rely primarily on internal funds, and externally, they would prefer debt before equity. This implies that the form of debt the firm decides on could signal its need for external sources of finance. The theory is founded on assumptions that managers have more information as compared to investors, capital markets are efficient, and that managers are concerned with the interests of old shareholders. They concluded that the larger the information asymmetry in a firm, the more expensive issuing equity becomes, since stock prices will fall. This is because, investors are aware that new equity will dilute the firm's ownership, and since they believe that managers are working for the benefit of old shareholders and have a greater knowledge of what is actually occurring in the firm, investors believe that the managers are only issuing the new stock because the stock is over-valued and they are trying to take advantage of it. Thus, based on this belief, the investors would place a lower value on the stocks, causing the share price to fall. However, issuing debt instead of equity for external financing will not cause the stock price to fall (Myers & Majluf, 1984).

The nature of transaction costs also appears to support the pecking order theory since transaction costs associated with getting external financing are larger than the costs of financing internally (Chen & Chen, 2011). However, some have criticised the arguments of the pecking order propositions. Frank & Goyal (2003) found in their study that the theory fails in explaining the capital structure decisions of small firms, where there is a bigger problem of information asymmetry. One of the findings in a study by Fama & French (2002) was that firms that do not pay dividends finance most of their investments with net new issues of equity, and the least-levered firms out of these were the ones who issued the largest net new equity. This is in opposition to the expectations of the pecking order theory which expects opportunities for more debt to be exhausted before equity is issued. Bessler, Drobetz & Gruninger (2010) document that their tests on U.S firms could not provide any findings to validate the theory since there was a low response of the firms' debt issuances to their financing deficit. Further, Fama & French (2005) noted in their findings that equity issues are common and pervasive, and are commonly by firms that are not under duress from excessive debt. These findings oppose the pecking order theory's proposition that firms will only issue equity as a last option, and only when all other sources are exhausted.

2.3.4 Agency theory

The theory depicts a principal-agent relationship where there is a contract in which a person or entity authorises another to act on his behalf and gives them some decision-making responsibility (Jensen & Meckling, 1976). This principal-agent relationship that is formed inherently implies that the principal has placed his trust in the agent. Jensen & Meckling (1976) note that if the parties to the relationship are seeking to maximise their utility, then it is unlikely that the agent will always act in the principal's interest and thus, the principal must incur costs to provide incentives and

monitor the agent, and the agent may be required to incur bonding expenditures. These costs are collectively referred to as agency costs.

Agency costs refer to the loss to shareholders from deviations between the interests of shareholders and those of managers (McColgan, 2001). Jensen & Meckling (1976) propose that the optimal capital structure results from a financing mix that aligns the interests of shareholders and managers, utilising a leverage level where agency costs are minimised. Leverage helps to minimise agency costs since it forces managers to act in a way that will increase firm profitability to be able to meet debt obligations and to avoid bankruptcy which may cause them to lose their jobs. Myers (1977) views the agency costs from a different perspective, stressing that a firm financing with risky debt and with managers who act in the interest of the shareholders will sometimes have to reject investment opportunities which could be a valuable source of market value of the firm. Thus, risky debt can reduce the value of a company with real options by creating an investment strategy that is suboptimal. Therefore, he opines that a suboptimal investment strategy is, of itself, an agency cost, and the optimal capital structure exists where the tax advantages of debt offset the costs of a future investment strategy that is suboptimal.

The applicability of agency theory to guiding the capital structure of firms in developing countries has been found to be limited. Even as increased leverage is expected to control agency conflicts under the agency theory, a study by Dawar (2014) found that debt has a negative effect on profitability which opposes the expectations of the agency theory. He notes that agency costs of leverage are small in developed countries as compared to developing ones, and this affects the applicability of the agency theory in obtaining an optimal capital structure. Agency costs of debt occur through the restrictions that creditors may place on debt to protect themselves from potential

defaults. Perrow (1986) has also criticized the theory for focusing mainly on the agent as the source of the agency problem.

2.4 Empirical Review

2.4.1 Debt maturity structure

The maturity structure of debt of a company is not designed callously. The levels of short-term and long-term debt are strategically chosen, with the aim of minimising costs and risks. Managers need to consider both the solvency of their businesses and the state of the economy in their financing decisions (Rashid, 2016). It appears that knowledge about the determinants of the choice of debt of firms is not exhaustive or conclusive due to the fact that detailed and readily available information on firms' debt and debt-like obligations are cumbersome to collect and analyse (Stohs & Mauer, 1996). Mitchell (1991) finds that companies issue more short-term debt when they face more information asymmetry in order to reduce adverse selection costs, although there was no support for the belief that debt maturity is matched to asset maturities. Guedes & Opler (1994) document that companies with high growth prospects use more short-term debt whereas large established companies use more long-term leverage. Similarly, Barclay & Smith (1995) also noticed that smaller firms that have more growth opportunities utilise a smaller percentage of long-term leverage in their debt structure. These researchers explain their findings as consistent with the agency cost theory, as discussed by Myers (1977), who noted that suboptimal investment, which creates agency costs, can be controlled by utilising and rolling over short-term debt which matures before investment options are exercised.

Titman & Wessels (1988) also discovered that small firms issue more quantities of short-term debt although the reasoning was different. They opine that this is so the small firms can avoid the costs of flotation associated with issuing longer-term debt. In contrast, Diamond (1991) found in his

study on debt maturity structure, that borrowers whose credit ratings are higher prefer short-term leverage, and those that have lower credit ratings would rather go for long-term debt. He views the choice as a trade-off between short-term maturities and liquidity risk, positing that companies with lower credit ratings cannot afford to take on the added liquidity risk (in the form of refinancing risk) that short-term debt creates. Given the discussion on the influences of the choice of debt maturity structure, this study seeks to further the dialogue by investigating how the maturity structure of debt affects firm performance, taking account of risk. In this paper, performance is viewed in terms of firm profitability.

2.4.2 Capital structure

Capital structure is a topic of great debate in the literature going as far back as the 1960s. Many of the studies have however been focused on identifying the determinants of capital structure. Stohs & Mauer (1996) found that larger, less risky companies matched long-term debt with the maturities of their long-term assets, and there was an indirect relationship between the maturity of debt and earnings surprises. These are similar to the findings in a research conducted on small firms which revealed that the choice of maturity of debt of small firms is determined by the timing of their asset maturities, capital structure and likelihood of default (Scherr & Hulburt, 2001). Toumi & Dadene (2014), in a study in Algeria, found that the determinants of financial structure are similar for SMEs and large companies. A study in Balkan countries determined that determinants of capital structure of companies differ between EU and non-EU countries (Ngjeliu, 2018).

A number of the studies that have been conducted have also narrowed down the focus to find out the determinants of debt policy. However, the findings vary. Research on listed firms in China identified the determinants of debt structure to be monetary policy, economic expectations, changes in tax rates and financial restrictions (Piao & Feng, 2013). A similar study in Mauritius

identified the important determinants as size, liquidity and growth opportunities, while profitability and tangibility of assets were not relevant (Fowdar , Lamport, Sannassee, Agathee, & Chong, 2009). Scherr & Hulburt (2001) also found that in small firms, the important determinants of debt structure are maturity of assets, capital structure and likelihood of default. Growth options, level of information asymmetry, and taxation were not significant. Ozkan (2000) identified growth opportunities, size and asset maturity as the significant determinants in the UK, while profitability and tax were insignificant, which is in line with the findings of Fowder *et al.* (2009). Thus, it appears there are no clear-cut determinants that are relevant in all contexts around the world. It is also unclear what specific factors are causing the variation in the determinants.

2.4.3 Leverage-performance relationship

A number of studies have sought to determine the effect that leverage has on profitability, with varying results, not unlike the diverse propositions of various capital structure theories. The nature of the relationship found between capital structure and performance may be largely influenced by the indicator of debt that is used by the researcher (Abor, 2005; Muhammad, Shah, & Islam, 2014), the performance indicators used (Saeedi & Mahmoodi, 2011; Salim & Yadav, 2012) and the country of study (Weill, 2008). For instance, Zeitun & Tian (2007) in a study examining the relationship between capital structure and firm performance in Jordan showed that leverage is inversely related to performance whether measured in accounting or market terms. In contrast, a study of industrial companies listed on the Amman Stock Exchange by Abu-Tapanjeh (2006) documents that debt has a significant positive impact on performance. This difference in the results of studies conducted in the same country may be attributable to the differences in the characteristics of samples chosen, as well as the choice of indicators.

Dawar (2014) demonstrated that there is a negative relationship between debt and financial performance of Indian firms measured by return on equity (ROE) and return on assets (ROA). A study on the effect that debt structure has on the performance of South African and Ghanaian SMEs (with performance measured by ROA, gross profit margin, and Tobin's Q) by Abor (2007) revealed that total debt ratio and long-term debt ratio have a negative effect on profitability in both South Africa and Ghana. However, the relationship was positive for SMEs in South Africa for short-term debt and trade credit. Similarly, Sadeghian *et al.* (2012) analysing the leverage-performance relationship in Tehran, also measured using ROE, Tobin's Q and ROA, found it to be negative.

A Nigerian study by Onaolapo & Kajola (2010) examining the effect of debt structure on financial performance and sampling non-financial listed companies on the Nigerian Stock Exchange revealed that debt had a negative effect on profitability, which was measured by ROE and ROA. Farooq & Jibran (2017) in a Pakistani study, found that small firms would benefit from using less debt since there is a negative relationship between leverage and profitability although the magnitude is higher for small companies than larger companies. Also, examining Swedish SMEs Yazdanfar & Ohman (2015) noted debt ratios negatively impact the profitability of firms. They notice that greater levels of debt appear to cause agency costs and the probability of loss of firm control to rise, and that the managers and the owners of SMEs prefer to use equity to a larger extent, which seems to oppose the expectations of the agency theory.

Although these studies appear to point largely toward an expected negative effect of debt on profitability, especially in the studies on emerging markets or developing countries, a number of researchers have found a positive leverage-performance relationship. Abor (2005) in a study on listed Ghanaian firms, noted a significant positive relationship between the short-term debt ratio

and total debt ratio, and profitability which was measured as ROE and total assets. This is in the same vein as the results of Mesquita & Lara (2003) who had similar results in a study on Brazilian industrial and service companies, also using ROE as the measure of performance. Weill (2008) found a positive relationship for companies in Italy and Spain. David & Olorunfemi (2010) studied for the impact of capital structure (measured by debt-to-equity ratio) on the performance (using market measures of earnings per share and dividend per share) of four firms in the Nigerian petroleum industry from 1999 to 2005, and the impact was revealed to be positive.

2.4.4 Risk and capital structure

Risk also provides an interesting and relevant dimension to the discussion on the relationship between debt policy and performance. Bopkin *et al.* (2010) in a study to determine how much corporate managers change their capital structures in reaction to exposures to risk on the Ghana Stock Exchange revealed that the nature and strength of the impact of the risk exposures are dependent on the variables used in measuring capital structure. This further validates the expectation that leverage can create risk. The trade-off theory proposes that increased levels of debt expose firms to bankruptcy costs. Therefore, as Van Horne (2002) noted, if bankruptcy is likely to occur and the resultant costs are significant, a firm with a high proportion of debt will not be as appealing to investors as one with less debt due to the strain that debt obligations put on the profits of such firms. Further, when risky debt is issued, the value of the company is decreased to its shareholders and debt holders due to the claims that liquidators and insolvency specialists could potentially have on the company's assets (Peirson, Bird, Brown, & Howard, 1990).

Firms have different risk exposures and characteristics, and taking into account this fact could alter the leverage-performance relationship and further add on to knowledge of the extent to which debt could be detrimental to profitability. For instance, Farooq & Jibran (2017) in a Pakistani study

investigating the effect of capital structure on performance, revealed that there is a negative relationship between leverage and profitability although its magnitude is greater for small firms than larger firms, and so small firms should use less debt. However, another study in Pakistan by Shah & Shah (2017) which sought to examine the effect of short-term financing on risk-adjusted profitability determined that there was an insignificant positive relationship. These differing findings within the same country context draw attention to the possible changes in results that may occur when risk is taken into consideration in determining performance.

In light of the foregoing discussions, it is quite apparent that the leverage-performance relationship is far from conclusive and there is no consensus on the exact nature of the relationship. There appear to be many different dimensions and variables that may alter the outcome. However, taking cue from established theories, namely capital structure irrelevance theory considering tax (Modigliani & Miller, 1963), agency theory and trade-off theory (Jensen & Meckling, 1976; Myers, 1977; Scott, 1977), the earlier stated hypotheses for the study were developed.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter deals with the procedures and techniques that were employed in order to identify, select and analyse information involved in this research and the justification for using these techniques and methods. It discusses the data collection strategies and the sources of data, the tools and techniques employed in analysing the data, the research approach and execution strategy, and other methodological issues. The chapter shows how data was obtained and analysed to reach the objectives for this paper.

3.2 Data and research approach

This study used a purely quantitative method of research. Quantitative research is a method that takes a systematic approach to empirical investigation of observable occurrences using statistical, computational or mathematical techniques (Given, 2008). Under this research approach, panel regression models were used to determine the cause-effect relationship between risk-adjusted profitability and measures of leverage. Descriptive statistics in conjunction with correlation matrices were also employed to highlight certain data characteristics. Given that the objectives for this study follow a cause and effect pattern, regression analysis proved to be the ideal method for data analysis.

The data used was secondary data that was obtained from the annual financial reports of 35 of the 40 companies listed on the Ghana Stock Exchange for the nine-year period from 2010 to 2018. The study excluded firms with data for less than five out of the nine years being considered. 5 listed firms fell into this category, and so they were not included in the study. The listed companies

were divided into 13 financial firms and 22 non-financial firms for the analysis. This was done in order to highlight any differences in the impact on the dependent variable for financial firms as against non-financial firms, which may be stemming from the vast differences in the nature of their operations. The 2010-2018 period was chosen because it represented the most recent periods with published audited financial statements. The nine-year period provided an adequate number of data points to be able to run a representative regression analysis, considering the number of predictor variables being studied. Companies listed on the Ghana Stock Exchange were chosen for this study because of the availability and consistency of published audited financial statements.

3.3 Estimation method

The study used panel regression since it utilized data points from different companies over a period of time. The data was analysed using STATA statistical software package. This software was chosen because it is a statistical package that is easy to use and allows ordinary researchers to conduct statistical analysis, data management and generate reports in a comprehensive way. Microsoft Excel was used to arrange and order the data for analysis, and the data points were arranged annually. In total, 297 data points were used.

The regression models had return on assets (ROA), calculated as the ratio of earnings before interest and tax to total assets, as the measure of profitability. This was however modified to incorporate risk by dividing the ROA by the inverse of the Altman Z-score to obtain the risk-adjusted profitability (ROAZ) as the dependent variable. This technique was adopted from Shah and Shah (2017). Altman Z-score is a formula that predicts the likelihood of financial distress (Altman, 1968). It measures this risk using five financial ratios measuring liquidity, leverage, profitability, solvency and activity. The use of these basic ratios in a predictive model makes it practical and applicable to real business situations, and this is one of the reasons why Altman Z-

score was preferred for this study. The specific form of the model used in this study is for public companies, which makes it suitable for the population under study.

The independent variables for the study were short-term debt ratio (SDA), long-term debt ratio (LDA) and total debt ratio (TDA). Market value of equity (MVE) was added as a control variable to represent size. The regression was run in three different groups, for the total number of firms, for solely financial firms, and for solely non-financial firms. This was done to facilitate comparisons. The regression models specified for the analysis of the total firms, and the financial firms were the same. However, for the non-financial firms, dummy variables were added to the regression models to cater for the possible risk characteristics of their various industry categories. The dummy variables were based on six industries, in accordance with the GSE classifications of the non-financial firms. The variables were Agriculture (Agric), Distribution (Dist), Food and Beverages (FoodBev), Information and communication technology (ICT), and Manufacturing (Manu). Mining industry was used as the reference variable.

The specified models for financial, and total firms are as follows:

I. $ROAZ_{i,t} = \beta_1 SDA_{i,t} + \beta_2 MVE_{i,t} + v_i + w_t + \varepsilon_{i,t}$

II. $ROAZ_{i,t} = \beta_1 LDA_{i,t} + \beta_2 TDA_{i,t} + \beta_3 MVE_{i,t} + v_i + w_t + \varepsilon_{i,t}$

The specified models for the non-financial firms are as follows:

III. $ROAZ_{i,t} = \beta_1 SDA_{i,t} + \beta_2 MVE_{i,t} + \beta_3 Agric_i + \beta_4 Dist_i + \beta_5 FoodBev_i + \beta_6 ICT_i + \beta_7 Manu_i + v_i + w_t + \varepsilon_{i,t}$

IV. $ROAZ_{i,t} = \beta_1 LDA_{i,t} + \beta_2 TDA_{i,t} + \beta_3 MVE_{i,t} + \beta_4 Agric_i + \beta_5 Dist_i + \beta_6 FoodBev_i + \beta_7 ICT_i + \beta_8 Manu_i + v_i + w_t + \varepsilon_{i,t}$

where:

$ROAZ_{i,t}$ = risk-adjusted profitability for firm *i* in time *t*

$SDA_{i,t}$ = short-term liabilities divided by total assets for firm *i* in time *t*

$LDA_{i,t}$ = long-term liabilities divided by total assets for firm *i* in time *t*

$TDA_{i,t}$ = total liabilities divided by total assets for firm *i* in time *t*

$MVE_{i,t}$ = log of market value of equity for firm *i* in time *t*

$Agric_i$ = 1 if the industry of firm *i* is Agriculture, 0 if otherwise

$Dist_i$ = 1 if the industry of firm *i* is Distribution, 0 if otherwise

$FoodBev_i$ = 1 if the industry of firm *i* is Food and Beverages, 0 if otherwise

ICT_i = 1 if the industry of firm *i* is Information and Communication Technology, 0 if otherwise

$Manu_i$ = 1 if the industry of firm *i* is Manufacturing, 0 if otherwise

v_i = fixed firm-specific effect for firm *i* that does not change over time

w_t = fixed time-specific effect in time *t* that does not change across firms

$\varepsilon_{i,t}$ = the error term

The Altman Z-score was computed as:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

where;

Z = Z-score.

X_1 = working capital divided by total assets.

X_2 = retained earnings divided by total assets.

X_3 = earnings before interest and taxes divided by total assets.

X_4 = market value of equity divided by book value of total liabilities.

X_5 = sales divided by total assets

A score below 1.8 implies that a firm is headed for financial distress. A Z-score greater than 3 implies that a firm is not likely to encounter financial distress, and a score between 1.8 and 3 is considered to be a gray area.

3.4 Hausman Test

There was the need to ascertain if a fixed effects estimation or a random effects estimation would be the most suitable for analysing the data. Fixed effects estimation is more suitable when the independent variables under study are correlated with the error term. If they are found not to be correlated, then random effects estimation is more suitable. A Hausman test was conducted on each of the specified regression models for the financial firms and the total firms, in order to determine which estimation method was to be used. The test was not conducted for the non-financial firms' models because for linear models including dummy variables, random effects estimation is appropriate.

For the test, the null hypothesis was that the differences in the coefficients were not systematic. The alternative hypothesis was that the differences in the coefficients were systematic. For the financial firms, the Hausman test resulted in p-values of 0.0017 and 0.0042 respectively for each of the specified regression models. Since the p-values were less than 0.05, it showed that the null hypothesis must be rejected. Thus, the models for the financial firms were run using linear fixed

effects estimation method. For the total firms, the Hausman test generated p-values of 0.0000 each, indicating that a linear fixed effects estimation method was also appropriate.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter shows the results of the data analysis. The analysis is primarily aimed at ascertaining the relationship that short-term debt, long-term debt and total debt have with risk-adjusted profitability, as well as comparing the outcomes for financial firms and non-financial firms. The results are discussed with reference to the reviewed literature and a priori expectations of the nature of the causal relationships between the predictors and the dependent variable. The results are grouped by total firms, non-financial and financial firms, and compared. The organisation and presentation of these results are aided by the use of tables.

4.2 Descriptive summary statistics

Table 1 displays the summarized descriptive statistics for the risk-adjusted return on assets (ROAZ), short-term debt ratio (SDA), long-term debt ratio (LDA) and market value of equity (MVE) for all the firms under study. From the table, there are 297 observations from a total of 35 firms. The mean ROAZ was 1.0153 with a variation of 8.8143. This shows that averagely, the companies are able to generate earnings 1.0153 times the assets used, when their risk is taken into account. This implies that the listed firms are performing quite well considering the risk that they incur in their operations. However, variation in this average ROAZ is quite high at 8.8143, implying that it is very volatile from firm to firm and over time. The mean SDA was 0.6484 with a deviation of 1.2452. This shows that an average of 64.84% of the assets of the companies is financed using short-term debt, with a variation upwards or downwards of about 124.52%. This mean also has a high variation, although it is understandable considering that the firms are from a variety

Table 1: Summary descriptive statistics for total firms

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROAZ	297	1.0153	8.8143	-2.1239	150.0023
SDA	297	0.6484	1.2452	0.0243	21.1263
LDA	297	0.1221	0.1864	0.0000	1.0614
TDA	297	0.7763	1.2300	0.0493	21.1263
MVE	297	2.9164	0.1346	2.5048	3.1205

of industries with different operations. LDA had a mean of 0.1221 with a deviation of 0.1864, indicating that the listed firms, on average, finance their assets with less long-term debt than short-term debt. The lower variation also indicates that the lower levels cut across the firms. The average TDA was found to be 0.7763, consistent with the results for SDA and LDA. The average size calculated using market value of equity (MVE) for firms was 2.9164 with a deviation of 0.1346, indicating that the sizes of the firms are not drastically different. Since these are listed firms, this matches the expectation that they would be reasonably large companies.

Table 2 displays the summary descriptive statistics of the financial and non-financial firms respectively. There are 13 financial firms, representing 113 observations, and 22 non-financial firms representing 184 observations across time. The mean ROAZ was 0.0514 for financial firms, with a standard variation of 0.1382. This indicates that the listed financial firms are performing moderately well considering the risk that they incur in their operations. However, the variation in this average ROAZ is implying that there are some financial firms that recorded ROAZ as low as -8.68% in a period. In contrast to this, for non-financial firms, the mean ROAZ was 1.6073, much

Table 2: Summary descriptive statistics for financial and non-financial firms

FINANCIAL FIRMS						NON-FINANCIAL FIRMS				
Variable	Obs	Mean	Std. D.	Min	Max	Obs	Mean	Std. D.	Min	Max
ROAZ	113	0.0514	0.1382	-0.0535	1.2920	184	1.6073	11.1681	-2.1239	150.0023
SDA	113	0.7112	0.2237	0.0709	0.9695	184	0.6099	1.5727	0.0243	21.1263
LDA	113	0.0749	0.1484	0.0000	1.0614	184	0.1511	0.2012	0.0000	0.9429
TDA	113	0.7861	0.1688	0.2737	1.3823	184	0.7703	1.5587	0.0493	21.1263
MVE	113	2.9488	0.0974	2.5782	3.0579	184	2.8964	0.1498	2.5048	3.1205

higher than that of financial firms. It also had a high volatility, recording a standard variation of 11.1681. The lower mean ROAZ for financial firms is possibly attributable to the financial firms primarily dealing in funds, which is inherently a risky business. Thus, the ROA may have been weighted by a higher Z-score (risk measure) in contrast to the non-financial firms. The mean SDA was 0.7112 and 0.6099 respectively, for financial and non-financial firms. The financial companies appear to use the most short-term debt on average. However, it is not unreasonable for banks to depend largely on customer deposits and short-term borrowings for providing loans. Diamond & Rajan (2000) noted that banks that would like to improve their ability to lend to difficult borrowers do not have much of a choice than to borrow short-term. LDA had a mean of 0.0749 showing that the financial institutions fund their assets with an average of 7.49% long-term debt, a very low percentage of total leverage. For the non-financial firms, it was 15.11% on average, with a low deviation of 2.43%. It appears non-financial firms use about twice the long-term debt financial firms use on average. Still, this is lower than expected. The average TDA was revealed to be 0.7861 and 0.7703 respectively for the financial and non-financial firms. It shows that the total assets of

financial companies are financed by an average of 21.39% equity. This may increase in the future, considering the increase in the minimum capital requirement for banks in Ghana. The average MVE for financial firms was found to be 2.9488, almost the same as the average of all the firms. In contrast, that of non-financial firms was 2.8964. This indicates that, they are slightly smaller on average than the financial firms. From Table 3, the industry that makes up the largest proportion of non-financial firms is manufacturing, with 36.41%. The least is ICT with 8.7%.

Table 3: Industry distribution of non-financial firms

Industry	Frequency	Percentage
Agriculture	9	4.89
Distribution	34	18.48
Food&Bev	31	16.85
ICT	16	8.7
Manufacturing	67	36.41
Mining	27	14.67
Total	184	100

4.3 Correlation results

Correlation matrices were developed to show the correlation coefficients of ROAZ, SDA, LDA, TDA and MVE for the total firms and the financial firms. Agric, Dist, FoodBev, ICT and Manu were added for the correlation matrix of the non-financial firms. Correlation helps to identify the nature and direction of the association between pairs of the variables under study.

Table 4: Correlation matrix for total firms

	ROAZ	SDA	LDA	TDA	MVE
ROAZ	1				
SDA	0.9297	1			
LDA	-0.0630	-0.1505	1		
TDA	0.9315	0.9875	-0.0038	1	
MVE	-0.0926	-0.1099	0.1972	-0.0854	1

Table 4 shows the correlation results of the total number of firms. The highest correlation of 0.9875 is found between SDA and TDA, indicating a high level of multicollinearity between them. This justifies their separation into different regression models in order to better assess their individual effects on ROAZ. However, contrary to expectation, LDA and TDA were not multicollinear, with an association of just -0.0038. This may be as a result of the companies using mostly short-term debt in financing their assets. TDA had the highest correlation with the dependent variable (ROAZ) of 0.9315. Since the relationship was positive, it signifies that the more total debt used by the firms, the higher the risk-adjusted performance, and vice versa. SDA also had a high correlation of 0.9297 with the dependent variable while LDA, in contrast, had a weak but negative correlation of -0.0630. MVE also had a weak relationship with ROAZ of -0.0926, as well as weak correlations with SDA, LDA and TDA. This result indicates that the bigger the firm, the lower its risk-adjusted profitability. This may also imply that larger firms are riskier than smaller ones.

Table 5: Correlation matrix for financial firms

	ROAZ	SDA	LDA	TDA	MVE
ROAZ	1				
SDA	-0.3522	1			
LDA	0.0270	-0.6560	1		
TDA	-0.4429	0.7482	0.0099	1	
MVE	-0.5846	0.4400	0.0537	0.6301	1

Table 5 illustrates the correlation coefficients of the financial firms. The highest correlation of 0.7482 was between SDA and TDA. This makes sense as a large portion of the total debt is made up of shorter-term debt. LDA and TDA were the weakest associated variables with a correlation of 0.0099. MVE had the highest correlation of -0.5846 with the ROAZ, indicating that the larger the financial firm, the lower the ROAZ. SDA and TDA have moderate negative relationships with ROAZ of -0.3522 and -0.4429. These are in contrast to the associations identified for the total firms, which showed strong and positive relationships with the dependent variable. LDA remains weakly correlated with ROAZ, but the relationship is positive for financial firms.

Table 6 displays the correlation of the non-financial firms. The highest correlation is 0.991, also found between TDA and SDA. This means that they are almost perfectly positively correlated. This is consistent with the relationship for financial firms, although their association was weaker. The weakest relationship of 0.003 was between FoodBev and ROAZ. This is followed by a

correlation of -0.004 between LDA and TDA. For non-financial firms, the association is negative and stronger than that of financial firms. SDA and TDA have the highest associations with the

Table 6: Correlation matrix for non-financial firms

	ROAZ	SDA	LDA	TDA	MVE	Agric	Dist	FoodBev	ICT	Manu
ROAZ	1									
SDA	0.944	1								
LDA	-0.095	-0.127	1							
TDA	0.939	0.991	-0.004	1						
MVE	-0.085	-0.160	0.300	-0.127	1					
Agric	0.058	-0.076	-0.158	-0.099	-0.035	1				
Dist	-0.046	0.011	-0.248	-0.024	0.338	-0.108	1			
FoodBev	0.003	-0.074	0.179	-0.054	-0.074	-0.102	-0.214	1		
ICT	-0.032	0.013	-0.153	-0.008	-0.103	-0.070	-0.147	-0.139	1	
Manu	0.070	0.152	-0.323	0.120	-0.450	-0.172	-0.360	-0.341	-0.234	1

dependent variable, ROAZ, with correlations of 0.944 and 0.939 respectively. Contrary to that of financial companies, the nature of the linkage for non-financial firms is positive, revealing that the more short-term, and total debt they use, the higher their risk-adjusted profitability. It appears that the non-financial companies may be less risky than the financial firms. Again, this is the opposite of the direction of the association for financial firms. There was a weak and negative relationship of -0.046 between MVE and ROAZ. This result is consistent with that of financial firms, although

the association was much stronger. For the dummy variables, they all appear to have weak associations with the dependent variable. The association is positive for Agric, FoodBev and Manu, meaning that firms in these industries have a higher profitability, or lower risk than distribution and ICT firms. Out of all the dummy variables, Manu has the highest correlation with another independent variable. This is an association of -0.45 with MVE indicating that the manufacturing firms tend to be larger in size.

4.4 Regression results

Regression analyses were conducted using linear fixed effects estimation method for the total and financial firms' models, and linear random GLS estimation for the non-financial firms, in order to estimate the causal relationship between risk-adjusted profitability and debt. The dependent variable (ROAZ) is regressed on short-term debt ratio (SDA), long-term debt ratio (LDA), total debt ratio (TDA) and market value of equity (MVE) for the total and financial firms. For the non-financial firms, Agric, Dist, FoodBev, ICT and Manu were included as dummy variables representing the relevant industries of the firms, with mining as the reference variable. MVE is a measure of firm size and is included in the models as a control variable. Due to multicollinearity, SDA was run in separate models from LDA and TDA. The results of the regression are presented and discussed in the ensuing sections.

4.4.1 Short-term debt and risk-adjusted profitability

Table 7 illustrates the regression results for short-term debt and risk-adjusted profitability for the total firms under study. SDA has a coefficient of 7.317487 indicating that a unit increase in short-term debt will cause risk-adjusted profitability to rise by 7.317487 units. This indicates that the firms can stimulate profits by increasing the short-term debt used in their business. This also indicates that for these firms, short-term debt may have been under-utilised in the past, possibly

due to fear of increased risks. This has in turn created more room for these firms to be able to have a larger tolerance for short-term debt in their businesses. Since listed firms are relatively large, this reasoning is in line with the expectations of Guedes & Opler (1994) that larger, more established firms will typically use less short-term debt. SDA and ROAZ have a significant relationship, with

Table 7: Regression results: Short-term debt on ROAZ for total firms

ROAZ	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
SDA	7.317487	0.1103177	66.33	0.0000	7.100257	7.534717
MVE	6.961976	4.132974	1.68	0.0930	-1.176388	15.10034
_cons	-24.03331	12.05551	-1.99	0.0470	-47.77217	-0.2944521
R squared	0.8645					
Adjusted R squared	0.8636					
F-statistic	2199.99					

a p-value of 0.0000. This finding matches that of Abor (2005) which also revealed a positive effect of short-term debt on profitability which was measured by return on equity. The implication is that, the risk of these firms is not high enough to erode the profitability that the short-term debt brings. MVE had a coefficient of 6.961976 but this was statistically insignificant. This relationship indicates that when short-term debt is being used, increasing size of a firm will cause risk-adjusted profitability to increase. Thus, larger firms can use higher levels of short-term debt and increase their risk-adjusted profitability. Other studies by Dawar (2014), Abor (2007) and Shah & Shah (2017) found firm size to be significant, although they used log of sales and log of total assets as

the measure of size. The adjusted R squared of 0.8636 shows that the model is well-fit, and the predictors give an explanation of 86.36% of the variation in the risk-adjusted profitability. The F-statistic of 2199.99 also indicates that the variables included in the model were relevant in improving its fit.

Table 8: Regression results: Short-term debt on ROAZ for financial firms

ROAZ	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
SDA	-0.6822616	0.1827988	-3.73	0.0000	-1.04502	-0.3195033
MVE	-0.0542556	0.3384207	-0.16	0.8730	-0.7258406	0.6173293
_cons	0.6965951	0.9572321	0.73	0.4690	-1.203001	2.596191
R squared	0.3529					
Adjusted R squared	0.3411					
F-statistic	8.36					

Table 8 shows that SDA has a coefficient of -0.6822616. This means that a unit rise in short-term debt will induce ROAZ to fall by 0.6822616 units. This relationship is shown to be significant at 0.05 significance level since it has a p-value of 0.0000. The negative relationship is in line with the findings of Abor (2007), whose results showed a significant negative impact of short-term debt on ROA of the SMEs. This indicates that, even when the overall financial risk levels of the financial firms are accounted for, higher levels of short-term debt are still detrimental to their performance. This finding highlights the impact of liquidity risk on the profitability of banks. Size (MVE) was found to have a statistically insignificant coefficient of -0.0542556. This indicates that

for financial firms using short-term debt, the increasing market value of equity leads to decreasing risk-adjusted profits, but by a smaller magnitude. This may be an indication that larger financial firms are incurring higher risks which are affecting their profitability. The independent variables altogether explain about 34.11% of the variation in ROAZ. This means that possibly more variables could be included in the model to explain the variation in ROAZ, although it may also mean that the financial results of financial firms inherently have a high level of variability. The F-statistic of 8.36 shows that the variables in the model improved its fit.

Table 9: Regression results: Short-term debt on ROAZ for non-financial firms

ROAZ	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
SDA	7.200653	0.138668	51.93	0.0000	6.928869	7.472437
MVE	7.66755	2.880828	2.66	0.0080	2.021232	13.31387
Agric	6.646713	2.050806	3.24	0.0010	2.627207	10.66622
Dist	-2.283619	1.327335	-1.72	0.0850	-4.885148	0.3179095
FoodBev	2.071982	1.449024	1.43	0.1530	-0.7680537	4.912018
ICT	-1.369373	1.674927	-0.82	0.4140	-4.652171	1.913424
Manu	-0.708938	1.361008	-0.52	0.6020	-3.376465	1.958589
_cons	-24.83614	8.841258	-2.81	0.0050	-42.16468	-7.507588
R squared	0.9252					
Adjusted R squared	0.9223					
F-statistic	2707.98					

Table 9 shows that as opposed to financial firms, non-financial firms have an SDA with a coefficient of 7.200653, pointing to a positive effect of short-term debt on risk-adjusted profitability. This result is statistically significant, with a p-value of 0.0000. This implies that for non-financial firms, the more short-term debt employed, the more profitable the firm is, taking into account its overall financial risk. This finding appears to indicate that for non-financial firms, short-term debt is beneficial for increased profitability. This is in contrast to the findings of Shah & Shah (2017), who found a negative insignificant relationship between short-term financing and ROAZ. This result also indicates that liquidity risk may not be as much of a problem for non-financial firms, as compared to financial firms. Size (MVE) had a coefficient of 7.66755, which was significant (p-value of 0.008). This indicates that for non-financial firms using short-term debt, the larger the size, the more profitable they are. This may also indicate that bigger non-financial firms are relatively less risky than bigger financial firms. The coefficient for Agric is statistically significant, and indicates that, on average, holding short-term debt constant, ROAZ is likely to be 6.646713 units more if the non-financial firm is in the agriculture industry than the mining industry. The coefficient of FoodBev (2.071982) also suggests that non-financial firms in the food and beverages industry are more profitable than the mining industry when short-term debt is held constant, although this relationship is statistically insignificant. Other than these industries, the non-financial companies in the mining industry appear to be more profitable on average than those in the distribution, ICT and manufacturing industries. It appears that the most profitable industry when considering risk is the agriculture industry, and the least profitable is the distribution industry. This may also indicate lower risks in agriculture and food and beverages, as opposed to distribution and ICT when short-term debt is used. The adjusted R squared of 0.9223 means that

the predictors, put together, give an explanation of about 92.23% of the variation in ROAZ, showing that the regression is well-fit.

4.4.2 Long-term debt, total debt and risk-adjusted profitability

Table 10: Regression results: Long-term debt and total debt on ROAZ for total firms

ROAZ	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
LDA	-7.504983	1.535464	-4.89	0.0000	-10.52857	-4.481401
TDA	7.308334	0.111441	65.58	0.0000	7.088888	7.52778
MVE	8.308881	4.186662	1.98	0.0480	0.0646501	16.55311
_cons	-27.97392	12.2269	-2.29	0.0230	-52.0507	-3.897132
R squared	0.8713					
Adjusted R squared	0.8700					
F-statistic	1434.87					

Table 10 shows the impact of LDA and TDA on ROAZ for all the firms under study. The coefficient of LDA is -7.504983 indicates that as the firm increases its long-term debt, its risk-adjusted profitability is lowered. This implies that higher amounts of long-term debt are detrimental to the profitability of firms, and that risk from going for long-term leverage may be high. This relationship is not surprising as long-term debt poses risks to solvency, and servicing long-term loans puts a strain on the profits of firms. This relationship is significant statistically at 0.05 significance level with a p-value of 0.0000. TDA, in contrast, has a coefficient of 7.308334 indicating that a unit increase in debt will result in 7.308334 units increase in risk-adjusted

profitability. This is similar to the results of Abor (2005), Weill (2008) and David & Olorunfemi (2010). The result for TDA compared to LDA implies that firms are better off using more short-term leverage in their debt structure. Consistent with the findings for short-term debt, size (MVE) had a positive relationship with ROAZ. The coefficient of 8.308881 indicates that the larger the firm is, the higher its risk-adjusted profitability. This implies that larger firms are able to handle risk better than smaller firms when debt is being used. The relationship is significant with a p-value of 0.048, unlike that of SDA. The model altogether explains 87% of the variation in ROAZ and the F-statistic of 1434.87 showed that the variables included in the model contribute to its fitness, and are jointly significant.

Table 11: Long-term debt and total debt on ROAZ of financial firms

ROAZ	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
LDA	0.8112439	0.2567075	3.16	0.0020	0.3017506	1.320737
TDA	-0.6917297	0.1837275	-3.76	0.0000	-1.056378	-0.3270814
MVE	-0.0644152	0.339557	-0.19	0.8500	-0.7383419	0.6095115
_cons	0.7243417	0.9603895	0.75	0.4530	-1.181766	2.630449
R squared	0.3540					
Adjusted R squared	0.3362					
F-statistic	5.72					

From table 11, LDA has a coefficient of 0.8112439 and is statistically significant with a p-value of 0.0020. This means that for financial firms, an increase in long-term debt will cause risk-

adjusted profitability to rise. This result can be explained by the high use of short-term debt for liquidity purposes in financial firms. This has resulted in high exposure to risks from short-term debt, whereas for long-term debt, there remains room for use. Financial firms may want to consider asset-liability maturity matching, such that long-term assets are funded with long-term debt. TDA has a coefficient of -0.6917297, illustrating that the more total debt a financial firm uses, the less profitable they are. The relationship is statistically significant, with a p-value of 0.0000. The result also points to a positive relationship between risk and the levels of total debt used by financial firms. This is supported by Peirson *et al.* (1990) who assert that higher levels of debt give liquidators potential claims on company assets which reduces the company value. It is also in line with the trade-off theory which proposes that increased debt exposes companies to increased bankruptcy cost, which in turn has an adverse effect on profitability. Coupled with the results for LDA, the implication is that financial firms may be better off reducing the overall debt in their capital structure, and the total leverage composition should have relatively more long-term debt. Perhaps, the increased minimum capital requirements for banks in Ghana will aid in achieving this. MVE has an insignificant negative impact on ROAZ, implying that larger financial firms using debt have lower risk-adjusted profitability. The adjusted R squared of 0.3362 indicates that the model may benefit from considering other variables that may also have some explanatory value.

Table 12 shows the analysis from the stance of non-financial firms. The coefficient of LDA is -8.963349 indicating that, for non-financial firms, higher levels of long-term debt will create a much larger reduction in risk-adjusted profitability. This further implies that long-term debt exposes non-financial firms to greater risks. This supports the assertions of Van Horne (2002) that debt obligations can put a lot of strain on the profits of firms through the threats and associated costs of

potential bankruptcy. The relationship found between LDA and ROAZ here is strong and significant statistically at 0.05 significance level. The coefficient of TDA for non-financial firms is 7.155141 and significant showing a p-value of 0.0000. This shows that risk-adjusted profitability is very sensitive to total debt for non-financial firms, but in a good way. It appears that the more total

Table 12: Regression results: Long-term debt and total debt on ROAZ for non-financial firms

ROAZ	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
LDA	-8.963349	2.004329	-4.47	0.0000	-12.89176	-5.034937
TDA	7.155141	0.1411017	50.71	0.0000	6.878587	7.431695
MVE	7.408702	2.61371	2.83	0.0050	2.285925	12.53148
Agric	5.696074	2.067668	2.75	0.0060	1.643519	9.748628
Dist	-3.101176	1.49048	-2.08	0.0370	-6.022464	-0.179888
FoodBev	1.509812	1.396044	1.08	0.2790	-1.226384	4.246008
ICT	-2.22717	1.744108	-1.28	0.2020	-5.645558	1.191219
Manu	-1.734871	1.502301	-1.15	0.2480	-4.679327	1.209586
_cons	-23.11672	8.107342	-2.85	0.0040	-39.00682	-7.226623
R squared	0.9276					
Adjusted R squared	0.9243					
F-statistic	2595.79					

debt that non-financial firms use, the more profitable they are. The positive relationship is accordant with the findings of Abor (2005), suggesting that non-financial firms have more room for using debt. MVE's coefficient of 7.408702 implies that larger non-financial firms are more profitable, and possibly less risky than larger financial companies. The findings also indicate that on average, holding long-term and total debt constant, non-financial firms in the agriculture industry are more profitable and possibly less risky than those in the mining industry. This relationship is statistically significant. Firms in the food and beverages industry also appear to have higher ROAZ on average, than those in the mining industry. Similar to the analysis for SDA, it appears that the distribution industry is the least profitable, or possibly the riskiest industry for the non-financial firms. The independent variables appear to explain only 92.43% of the variation in ROAZ, with a high F-statistic of 2595.79 which indicates that the variables are relevant in explaining the fitness of the model.

CHAPTER FIVE

CONCLUSIONS AND DISCUSSIONS

5.1 Introduction

Research on the leverage-performance relationship has been inconclusive with varied findings by different researchers, and the effects of risk have been widely ignored in this area. Risk is an unavoidable part of the operations of companies. The aim of this study was to incorporate financial risk in the discussion of debt policy and profitability. The study sought to ascertain the effect of debt maturity structure on risk-adjusted profitability. The data utilised in the study was obtained from the financial statements of 13 financial firms and 22 non-financial firms which are listed on the Ghana Stock Exchange (GSE) for the period from 2010 to 2018. Linear random GLS estimation and linear fixed effects estimations were used to analyse the nature of the relationships between short-term, long-term, and total debt measures on risk-adjusted profitability, for the total number of firms. The impacts on financial firms were also compared with those of non-financial firms. The impact of various industry groupings of the non-financial firms in influencing risk-adjusted profitability was also assessed. This chapter synthesises the key findings of the study, highlighting its implications, and providing appropriate recommendations. The chapter also proposes directions for areas of potential further research that can be derived based on this research.

5.2 Summary of findings

The study revealed that the mean risk-adjusted profitability (ROAZ) of the total listed firms being studied was 1.0153. However, the non-financial firms alone had a much higher average ROAZ of 1.6073 than that of financial firms (0.0514), indicating that the non-financial firms were more profitable on average. Total debt ratio (TDA) had the strongest correlation with ROAZ for the total

firms, and the association was positive. The strongest for financial firms was a negative association between market value of equity (MVE) and ROAZ, while that of non-financial firms was a positive association of short-term debt (SDA) with ROAZ. The regression outputs for the total firms revealed that short-term as well as total debt have a strong positive relationship with risk-adjusted profitability, whereas long-term debt has a strong negative correlation. All of these were statistically significant. For financial firms, short-term debt and total debt have a negative impact on risk-adjusted profitability which is in contrast to non-financial firms, which were found to have significant positive impacts. However, for long-term debt, non-financial firms have a significant negative relationship with risk-adjusted profitability, while financial firms had a positive and significant relationship. The findings showed that the impacts of SDA, LDA and TDA were contradictory between financial and non-financial firms. The agriculture industry was discovered to be the most profitable industry for the non-financial firms, while the distribution industry was the least profitable.

5.3 Implications and recommendations

The firms, in total seem to be performing well be high profitability relative to risk. Increasing debt seems to be a viable source of funding for these companies, and the composition of debt should be made up of larger quantities of short-term debt. It appears that financial firms incur higher risks, and have profits that are more sensitive to these risks. It would be beneficial to financial firms to employ less overall debt in their operations, and depend more on equity and retained earnings for financing. Long-term debt should also be increased in their debt structure. It is advisable for financial firms to enhance their risk management procedures in order to mitigate the risks that they incur, especially in terms of liquidity risks, as there appears to be an over-reliance on short-term debt financing. Banks may want to engage in more of maturity matching, and avoid financing

long-term assets with shorter-term debt. Conversely, non-financial firms have more room to operate, in terms of debt financing. However, they should use less long-term leverage in their debt portfolio. Increasing short-term debt could provide an opportunity for stimulating their profitability. It is important though that they do not employ this too excessively. This is because, excessive short-term debt could create high levels of risk that would eventually erode its expected advantages. The different industries also appear to influence the profitability of non-financial firms. As such, non-financial firms must adequately analyse their respective industries, taking into account the market conditions and the industry risk. These issues should always be considered by the non-financial firms when making debt structure decisions since it could greatly influence the outcome on profitability.

5.4 Directions for possible future research

The dimension of risk-adjusted profitability seems to be a relatively new introduction into the discourse on leverage-performance relationships. This study, despite its best efforts, failed to capture the entirety of the risks faced by companies. It may be possible for further researchers to explore risk-adjusted profitability using measures other than the Altman Z-score, which may incorporate other forms of risk beyond the everyday financial ratio measures. Also, the exploration into other possible determinants of risk-adjusted profitability could help to identify more variables that could enhance the fitness of some of the models in this study. It may be interesting to also analyse how the impact may alter for small and medium scale enterprises (SMEs).

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