The Impact of Capital Structure on Non-Financial Firms Performance: Evidence from South Africa

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ABSTRACT

This research studies the impact of capital structure on firms' performance, based on a sample of 30 South African firms listed on the Johannesburg stock exchange market during the period 2009-2014. The performance measures used are; return on equity (ROE), return on asset (ROA), and Tobin's Q ratio which are the dependent variables. Total debt ratio (TDR), long term debt ratio (LTDR), short term debt ratio (STDR), debt to equity ratio (D/E) and size have been used as measures of capital structure. By using the random effect panel data regression method, we found that ROE is significantly negatively related to TDR and D.E ratio. Also, Tobin's Q is positively related to STDR and negatively related to size. However, there is no statistical significant relation between ROA and capital structure of firms. Aside from the positive relationship between Tobin's Q and STDR, we can conclude that capital structure has a negative impact on firms' performance.

Keywords: Capital structure, Firm performance, Return on Equity, Return on Asset, Tobin's Q.

ÖZ

Bu çalışma 2009-2014 yılları arası JohannesburgBorsasında işlem gören 30 Güney Afrika firmasının sermaye yapılarınınperformansınasıl etkilediğini incelemiştir. Kullanılan performans ölçütleri(bağımlı değişkenler); Özkaynak getirisi (ROE) Varlık getirisi (ROA) ve Tobin Q oranıdır. Toplam borç oranı (TDR), uzun vadeli borç oranı (LTDR), kısa vadeli borç oranı (STDR), sermaye borç oranı (D / E) ve şirket büyüklüğü sermaye yapısı ölçütleri olarak kullanılmıştır. Çalışmada rastgele (random) etki panel veri regresyon yöntemi kullanılmıştır. Çalışma sonuçları ROE anlamlı ölçüde TDR ve D/E oranı ile olumsuz olarak ilişkili olduğunu göstermektedir. Çalışmada ayrıca, TobinQ'nunSTDR'dan pozitif, şirket büyüklüğünden ise negatif etkilediğiistatistiki olarak anlamlı bulunmuştur. Ancak, ROA ve firmaların sermaye yapısı arasında istatistiksel olarak anlamlı bir ilişki bulunamamıştır. Sonuç olarak Tobin Q ve STDR arasında pozitif ilişki dışında, araştırmada kullanılan şirketlerin sermaye yapılarının şirket performansına olumsuz etki yaptığı sonucu ortaya çıkmaktadır.

Anahtar Kelimeler: Sermaye yapısı, Firma performansı, Özkaynak kârlılığı, Aktif karlılığı, Tobins Q.

DEDICATION

This work is dedicated to:

My Father and Mother,

My loving brothers and sister (Elves, Gilbert, Modestus, and Nadege)

Whose constant prayers, love, care, and encouragement have always been there for every great stride I made in life.

My Fiancé (Chia Kenneth Toh)

Who brightened my stressful nights and inspired me through out.

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LIST OF ABBREVIATIONS

D/E	Debt to Equity Ratio
DW	Durbin Watson
LNA	Log of Asset
LTDR	Long Term Debt to Asset Ratio
OLS	Ordinary Least Squares
Q RATIO	Tobin's Q Ratio
ROA	Return on Equity
ROE	Return on Asset
STDR	Short Term Debt to Asset Ratio
TDR	Total Debt to Asset Ratio

Chapter 1

INTRODUCTION

1.1 Background

Managers of both financial and non-financial organizations are usually faced with the question regarding the way through which they will obtain finances needed to support its future projects. Capital structure can be referred to as the combination or the mix of debts and equity used by firms as a source of financing their operations (Kimbi and Itoe, 2015). Watson and Head (2007) referred this as a firm's long term financial mix. The way through which a firm gets its finances is of great importance to both the shareholders and managers of a firm. This is because if a wrong decision is arrived at, this can have devastating consequences on the performance and continuity of the firm. In the pursuit for a desirable capital structure, managers do not only seek to make the firm's cost of capital as low as possible but equally to make the firm's profitability and worth as big as possible.

Due to the importance of capital structure of firms, there has been the development of many theories to assess it impact on the performance of firms. Modigliani and Miller (1958) were the first people to develop a theory on capital structure. Under the assumption of perfect market conditions, no tax, no bankruptcy, they say that capital structure is unimportant in the determination of a firm's value. A firm's performance is determined by its asset. This theory is unrealistic. Latter Modigliani and Miller

(1963) relaxed the assumption of zero tax and brought up a new theory about the tax benefits of debt.

The choice of debt or equity financing or both depends on the firm. Some firms will prefer debt financing while others will prefer equity financing. Debt financing is mostly preferred because the interest paid on debts provides tax shields. This goes a long way to increase the value of the firm. Debt financing is used as a means to discipline managers. Since managers are aware of the fact that interest is to be paid on the debt the firm has, they will be forced to invest free cash flows in projects which can yield enough income for the settlement of their liabilities. This limits the waste of cash by managers (Jensen, 1986). Other theories on capital structure include the pecking order theory (Myers and Majluf, 1984), the agency cost theory (Jensen an Meckline, 1976) and the trade-off theory (Myers, 1984).The pecking order theory sought to explain why firms which have a high level of profitability usually borrow less. This is based on the fact that managers are more informed on issues concerning their firms than outside investors. As such, investors do not trust managers when they issue new stocks as they do not know if the stocks are over or under priced. Base on this incorrect perception, firms will prefer to issue debt instead of equity if they fall short of internal financing. The trade-off theory is out to clarify the fact that managers usually think of the debt equity decisions of the firm as a trade-off between interest tax shield and the cost of financial distress. The agency cost theory explains the relationship that exists between shareholders and controllers of their firms. The objectives of these two parties do not usually match. While the shareholders are out to maximize their wealth, managers are seeking to maximize profitability which will go a long way to impact on their salaries. Managers will usually invest free cash flows into activities that will not benefit the owners. The agency cost hypothesis

therefore says that higher levels of debts will urge managers to work in the interest of owners. A firm with high debts may lead to a drop in agency cost, hence better performance. These theories states that, if capital structure decisions are not important in a perfect market condition then in a real life situation which is characterized by imperfect market, capital structure will be expected to have an impact on the performance of South African firms. These will be further explained in details under the literature review.

1.2 Aim of Study

The choice of SA as a case is because it serves as the backbone of Africa when it comes to aspects such as capital structure and the performance of firms as it has got well developed firms that can really explain the impact of capital structure on firm performance. The main aim of this research is to analyze the impact of capital structure on SA firms' performance. One crucial problem faced by financial and non-financial organizations in developing countries like SA is the choice of a capital structure that will satisfy all the relevant stakeholders by maximizing the current value per share of existing stock. As such this study aims to aid managers of SA enterprises whenever they decide on the proportion of capital structure to employ in order to satisfy all the relevant stakeholders through good performance. The results from the findings will help the SA companies in the selection of an optimal capital structure.

What motivates this research is the fact that many different studies have been carried out on capital structure with different results. There are mostly in the developed countries. Much work on capital structure has equally been done in the developing

countries including SA. These conflicting results mean a study that gives an optimal capital structure has not been accomplished. As such more work has to be one.

1.3 Scope and Limitation of Study

This study investigates the impact of capital structure on the performance of SA firms based on a sample of 30 listed firms in Johannesburg stock exchange market, SA from 5different sectors (mining 5, consumer products 7, telecommunication 3, retail an stores 10, health care 5) based on the period from 2009 to 2014. Base on the availability of data, the scope of this work is restricted to firms listed on the JSE.

1.4 Data and Methodology

In this research, methodology has been use in order to get the desirable results of the study. This study uses panel data methodology. The years of study range from 2009 to 2014 while the sample is made up of 30 firms (non-financial) listed in the JSE market in SA. Data has been obtained from the web and equally from Thomson Reuter's DataStream. The dependent variables of the study are return on assets, Tobin's Q ratio and the return on equity ratio which are measures of firm performance (profitability). The independent variables are total debt to asset ratio (TDR), long term debt to asset ratio (LTDR), short term debt to asset ratio (STDR), debt to equityratio (D/E) and the control variable size. In order to get the significance of our sample, the probability value (prob value) from the regression results will be conducted. Microsoft Excels and E- Views 7 will be used in order to obtain the regression results of the three models and equally to test autocorrelation among variables.

1.5 Disposition

Chapter one dwells on background, aim, scope and methodology of study. Chapter two is based on literature review of past studies and theories of capital structure.

Chapter three is based on data and methodology of the study. Chapter four is based on the empirical results and discussion. Chapter 5 will dwell on discussion and conclusion.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The aim of this study is to investigate the impact of capital structure on the performance of South African firms listed on JSE market. Capital structure is a very important concept in finance and as such, a lot of work has been done on it. Firms seek to maintain an appropriate capital structure by striving to maximize performance and at the same time try to keep financing cost as low as possible. In this chapter, the researcher will start by explaining the various sources of financing for firms and then proceed to explain the various capital structure theories.

2.2 Sources of Financing for Firms

Firms may raise long term financing through two main sources. These are internal financing and external financing. Internal financing occurs when a firm uses its retained earnings or plough back profit to finance its transactions. Shareholders are usually happy to plough back profit into the firm provided the investments that managers will undertake are expected to yield a positive returns for the shareholders (Brealey, Myers, and Allen, 2008, p. 370). They went further to explain that, when internal cash cannot cover investments, the tendency is for managers to cut down on dividend payment thereby increasing retained earnings; that is readjusting dividend policy.

When a firm faces financial deficit, it turns to external financing. This can either be through the issue of debts or equity. Marcus (1995) defined external financing as a source of funding which lies outside a business or economic unit. In debt financing, companies borrow money from lenders with a promise to repay the principal plus interest at a specified future date (Brealey et al; 2008, p. 379). Debt financing is mostly used as a means of external financing for firms that need extra funds to finance their operations if internal financing is not sufficient (Baltaci and Ayaydin, 2014.). Different types of debts can be issued by firms some of which are listed bellow

Table 1: Different types of debts

Bank loans	Convertible bonds	Zero coupon bonds
Unsecured debentures	Commercial papers	Callable bonds
Money multiplier note	Floating rate bonds	Warrant
Euro bonds	Account payables	Lease

Source: Brealey et al, 2008, p. 380.

Another option for external financing is through the issue of equity. This is done by issuing new shares to investors in exchange for a portion of the company (ownership). The maximum number of shares that managers are allowed to issue is known as the authorized share capital (Brealey et al, 2008). When it comes to external financing majority of firms use debt financing rather than equity financing (Goswami and Shrikhande, 2001). This is because debt is less risky than equity and as such, it cost is less than that of equity.

Generally, internal financing is usually preferable because of the following reasons;

- When internal financing is used, managers avoid bad signals to investors. When new equity is issued, investors see this in a different way. They believe that managers try to sell new stocks when stocks are overpriced. This leads to a fall in the price of shares.

- Internal financing avoid the under investment problem. Managers usually avoid taking risky projects even though it may be good for shareholders. This is because if the project turns out to be bad, they might lose their jobs. This problem is avoided when internal financing is used.

- Internal financing avoids the discipline of financial markets.

On the contrary, internal financing may encounter the following problems;

- There is usually a limit to the amount a shareholder can invest.
- Internal financing is usually a slow method of raising finances.
- Businesses may not make sufficient earnings to plough back.

2.3 Capital Structure Theories

After Modigliani and Miller (1958) came up with the irrelevance theory of capital structure, many other researchers became interested in studying the impact of capital structure on firm performance. Some of these theorists were in favor of mm theory while others were against. This study will throw more light on the mm theory, trade off theory and the agency cost theory.

2.3.1 Modigliani and Miller (1958)

This theory is usually considered as the cornerstone of corporate finance. It is also known as the irrelevance proposition. The theory states that, in an economy characterized by a perfect market condition that is; zero tax, nil bankruptcy, no information irregularity, the worth of a firm is not affected by the composition of its capital structure which is the blend of debts and equity (Modigliani and Miller, 1958:261). Increasing or decreasing the proportion of debt or equity used in financing the firm's project will keep the value of the firm at a constant level. They went further to explain that the value of a firm which can be gotten by adding debts and equity relies only on the revenue stream created by its tangible assets. Any profit gotten from the use of less expensive debt is compensated by the increase in cost of the riskier equity (Miller 1991). MM (1958) went further to state that, no matter the manner through which debt and equity are combined, the weighted average of the two will always remain the same. Myers (2001) supported this theory by stating that firms' value will not change if they borrow more or less. Modigliani and miller (1958) equally made an assumption that every firm has its own level of risk but Stiglitz (1969) says this assumption is not important.

Due to a lot of criticisms leveled against MM no tax theory which was the first proposition, MM (1963) addressed the assumption of no tax. They said that under certain conditions, a firm can be totally debt financed because interest payments on debts are tax deductible. They went further to explain this by stating that as leverage increases, the cost of equity increases in direct proportion. But as the cost of equity increases, it does not lead to change of the cheaper debt. As such, the WACC drops as leverage increases (Brealey et al; 2008). From the above explanation, one can say that higher leverage will reduce the WACC and hence increase the market value of

firms. Also, MM proposition cannot be used by firms when making decisions of optimal capital structure as it is very impossible to find a perfect market in the real world.

2.3.2 The Pecking Order Theory

This theory was brought forward by Myers and Majluf (1984). It is based on the fact that firms which are highly profitable are expected to borrow less. This is because there is asymmetry of information between managers and investors (Brealey et al; 2009). The theory states that managers are more informed when it comes to issues concerning the intrinsic value of their firms and equally how exposed the firm is to risk than the investors. The result of this is that investors might not be willing to buy shares issued by firms if they fear the shares are mispriced. Based on this, managers will usually prefer internal financing or riskless debts as it does not send any bad signals which might have an impact on their stocks (Brealey et al; 2009). In a situation where external financing is necessary, firms will normally go for debts rather than the issue of new stocks. Equity can only be considered as a last resort purposely for the bad signal it sends to investors.

This theory equally explains that, firms with little profit will usually go for more debts as their internal funds are not sufficient to finance their projects while profitable firms borrow less because they do not need external financing (Brealey et al; 2009: 459). Debts will increase when the cost of the project is more than internal funds and decrease when they are less than internal funds. Myers and Majluf (1984) state that, with information asymmetry the issue of equity is viewed by investors as bad news. Bennett Stewart (1990) viewed this in a different way: “raising equity

conveys doubt. Investors suspect that management is attempting to shore up the firm's financial resources for rough times ahead by selling overvalued shares."

2.3.3 Trade-off Theory

When it comes to literature on capital structure, the trade-off theory dominates. This theory was initiated by Kraus and Litzenberger (1973). There comes a point in time when bankruptcy cost exceeds the marginal tax benefits enjoyed by firms. This happens when firms continue to substitute debts for equity. Managers usually think of a capital structure decision as a tradeoff between tax benefits and the cost of financial distress also known as the bankruptcy cost (Myers 2001). This theory states that the proportion of debt in the capital structure of firms varies. Firms with assets and a high level of taxable income are expected to go for a high debt ratio in order to benefit from the tax deductible property of interest while unprofitable firms with riskier assets will prefer to be equity financed (Brealey et al; 2008). Deangelo and Masulis (1980) forecast that firms will keep up with a reasonable capital structure by ensuring that the gains (tax shield) and cost of debts (financial distress) are at equilibrium. This theory implies that firms usually have target leverage and will always try to maintain this target leverage.

Table 2: Comparison between trade-off theory and pecking order theory.

Trade-off theory	Pecking order theory
Assumes a relatively static capital structure	Allows for a dynamic capital structure
Considers the influence of taxes, transaction costs and financial distress	Considers the influence of financial slacks and the availability of a positive NPV projects
Ignores the impact of capital market signals	Acknowledges the impact of capital market signals
Cannot explain many real world practices	Explain many real world practices

Source: Thomas J. IIesz, 2002)

2.3.4 Agency Cost Theory

Some firms usually choose their capital structure based on the agency cost theory. An agency relationship as defined by Jensen and Meckline (1976) is a relationship under which the principal authorizes a third party known as the agent to act on her behalf. This is a type of relationship that exists between managers and owners of firms. If the aim of the parties involved is to maximize their personal benefits, an agency problem will arise as the agent might not act in the best interest of the principal. The principal (owners) can limit such actions by the agent (manager) by putting in place appropriate measures to control the actions of the agent. By so doing, the principal incurs monitoring cost. Jensen and Meckline defined the agency cost as the sum of monitoring cost, bonding cost and residual loss.

The effect of agency cost on outside equity can be gotten by making a comparison of the way a manager behaves when he possess all the residual claims on the firm with the way he behaves when he owns less than 100% of those claims by selling a portion of the shares to outsiders (Jensen and Meckline, 1976). When the manager is a sole owner, he will make decisions that will give him optimal satisfaction. These benefits are both pecuniary and non-pecuniary. When he later on sells part of his shares to outsiders, agency cost comes in as his interest in the firm will be diverged with those of incoming shareholders. He will bear just a portion of the cost of any non-pecuniary benefit he takes out in order to maximize his utility. As the owner manager interest diverges from those of prospective minority shareholders, it impacts on the price the minority shareholders are ready to pay for the shares. Thus as the fraction of the firm owned by the owner falls, the cost on the owner for obtaining any additional cash from the equity market rises. A high level of debt financing is usually preferred as it will prevent managers from using free cash flows in projects which

will not benefit the owner (Jensen and Meckline, 1978). When a firm has debts, managers are bound to make interest payment. As such the amount of free cash flow available is limited. They try as much as they can to invest the little they have in profitable projects hence working in the interest of the owners. Harris and Raviv (1988) explained higher debts in the capital structure of a firm as an antitakeover instrument. Managers who are scared to lose their jobs after takeover will accumulate higher than require level of debt.

2.4 Empirical Review

A lot of works have been carried out on the impact of capital structure on firm performance both in developed and less developed countries. Most of the results show a negative relationship between long term debt and firm performance. Kim and Sorensen, (1986) carried out a research and found out that; firms with high insider ownership have a higher debt ratio than firms with low insider ownership. Rajan and zingales, (1995) carried out a research in the G7 countries. The results were that profitability is negatively related with leverage. The negative relationship that will exist between a firm's leverage and its performance will increase as the firm grows. Majumder and Chibber (1999) pointed out that leverage was inversely related to firm performance in India. Deesomsak, Paudyal, and Pescotto, (2004) in their study argued that leverage and profitability are negatively related. This was based on the pecking order theory suggestions that, managers prefer internal financing to avoid information asymmetry between bosses and outsiders.

Abor, (2005) researched on the effect of capital structure on profitability in Ghana and the results were a positive relationship between STDR and TDR ratios and ROE but an inverse liaison between LTDR ratio and ROE. Also, Margaritis and Psillaki

(2007) equally checked the connection between leverage and the performance of firms for a subset of the population of New Zealand small and medium size enterprises and confirmed that higher leverage moves along side with better performance. This is in accordance with the agency costs theory. Moreover, Onaolapo and kajola (2010) in their study on Nigerian firms found a significant inverse effect of leverage on financial measures of firm performance. Ogbulu and Emeni, (2012) conducted a similar study to determine the relationship between capital structure and firm performance in Nigeria. The study concluded that equity capital is irrelevant to the value of the firm, while long term debt is a major determinant of firm's value. Ahmad, Abdullah, and Roslan (2012) in their study based on Malaysian firms came up with the suggestion that short term debt and total debt have a significant relationship with ROA. Wissem and Mohamed (2015) researched on ownership structure, leverage and firm value in selected French firms and had the same view. The effect of ownership is positive on leverage and firm value. In addition to the above, Ngambi and Itoe (2015) in their research paper Capital structure and firm performance of SME Cameroon came up with the results that leverage is negatively related to performance. They supported the pecking order theory that firms in Cameroon prefer internal financing when faced with investment opportunities.

There were some empirical findings regarding South Africa. Ramjee and Gwatidzo, (2012) in their research on the dynamics in capital structure determinants in South Africa found a negative relationship between leverage and profitability. Also, it suggested that capital structure decisions of South African firms are in line with both the pecking order and trade off theories of capital structure.In addition, Samuel, F. (2013) in his work on capital structure, product market competition and firm

performance examined the effect of capital structure on firm performance on a sample of South African firms and the result suggested that financial leverage has a positive relationship and significant effect on firm performance.Moyo, Wolmarans, and Rummer. (2013) in their paper work on trade-off or pecking order theory evidence from south African firms suggested that, leverage is positively correlated with performance. This is in support of the trade- off theory. All these empirical studies are summarized on the following table;

Table 3: Summary table for empirical studies

Name	**Negative impact**	**Positive impact**	**Theory**
Kim and Sorensen (1986)		X	Agency cost
Rajan and Zingales (1995)	X		Pecking order
Majumder and chubber (1999)	X		Pecking order
Deesomek et al; (2004)	X		Pecking order
Abor (2005)	X	X	Pecking order/ Trade off
Margantis and Psillaki (2007)		X	Trade-off
Onaolapo and Kajola, (2010).	X		Pecking order
Ogbulu and Emeni, (2012).	X		Pecking order
Ahmad et al; (2012).		X	Trade-off
Ramjee and Gwatidzo, (2012)	X		Pecking order
Moyo et al; (2013).		X	Trade-off
Samuel, F (2013)		X	Trade-off
Ngambi and Itoe, (2015).	X		Pecking order
Wissem and Mohamed, (2015)		X	Trade-off

Chapter 3

DATA AND METHODOLOGY

This part focuses on research design, data, and variables used and the means through which data is obtained.

3.1 Research Design

The predominant purpose of this work is to assess the effect of Capital structure on the Performance of South African firms which are measured by ROE, ROA, and Q ratio. Capital structure of firms is measured by total TDR, long term debt to asset ratio (LTDR), short term debt to asset ratio (STDR), size (used as a control variable) and debt to equity ratio.

3.2 Data

3.2.1 Sample Description

South Africa is one of the largest economies in Africa. It serves as the back bone of Africa thereby encouraging the development of many companies to carter for the needs of the growing population. According to World Bank's 2013 review, SA has a GDP per capita of USD 6,617.91, a GDP of USD 350.6 billion, and a GDP growth rate of 1.9 percent annual change. The unemployment rate stands at 26.6 percent in 2016.

This study uses pure quantitative approach. Cross section data has been gathered for 30 listed firms, selected randomly from the so many firms established in the country which are non-financial and privately owned. The data is collected from five

different sectors of the economy and from the period 2009 to 2014 which denoted time series methodology. Panel data will be used in this research as it has both cross-section and time series dimension. Panel data is a very good method to quantitative study because "by bringing data together in a panel form, panel data provides data which is more informatory, more variability, less colinearity among variables, more degree of freedom and a greater level of effectiveness" (Ranjit, 2012, p. 2).

Table 4: Sample by sector.

Numbering	**Sectors used**	**Rime of Firms**	**Proportion (%)**
1	Retail and Stores	10	34
2	Consumer products	7	23
3	Mining	5	16.5
4	Healthcare and pharmaceuticals	5	16.5
5	Telecommunication	3	10
Total		**30**	**100**

The companies from the various sectors selected for this study are among the top companies listed on the FTSE/JSE index series as of September, 2013. The total market capitalization for these companies is about 5.6 trillion Rands. This represents about 85 percent of FTSE/JSE index series market capitalization (FTSE/JSE, 2013).

This shows how representative the sample is to the total population of firms listed on JSE. The mining industry is the main reason behind the rapid development of the economy. South Africa is one of the largest suppliers of minerals to the world through export. The retail sector contributes about 13.3% to the gross domestic product of the country (SA Mine, 6th Edition, PWC analysis). Also, these sectors have contributed a lot to the economy when it comes to employment; Shoprite which

is the largest retailer in South Africa has close to 90,000 employees while Pick n Pay which occupies the second position has about 50,000 employees (buzzsouthafrica.com).

Firms with other forms of incorporation such as government owned companies have not been used since their capital structure is different from that of privately held companies. This could distort the result of the study. Firm from finance company have been excluded as well since their manner of financing is different from those of firms from other sectors of the economy.

3.2.2 Limitation and Sources of Data

Data could be obtained by either using the primary source or the secondary source. The data for this study is collected from the secondary source. Secondary data refers to data already collected and analyzed by someone else; that is from Thomson Reuters DataStream. Based on the accessibility of data, the breadth of this work is based only on South Africa (SA) nonfinancial firms quoted on the Johannesburg Stock Exchange market from 2009 to 2014. Data collected is limited to five sectors of the economy as presented on table 3.1 above. Data for the study is collected from Thomson Reuters' data stream and world scope.

3.3 Choices of Variables

The variables used and tested in order to arrive at the objective of the study will be explained in this section. These variables are similar to those used by Abor, (2005), and Opoku, Adu and Anarfi (2012).

3.4 Dependent Variables

As mentioned earlier, financial performance is the main dependent variable of this study. To measure the financial performance of firms, investment, efficiency,

profitability and market value factors need to be taken into consideration. The following dependent variables have been used in this study. ROE measures profitability, ROA measures efficiency, and Tobin's Q measures market value. All these variables will be explained bellow.

3.4.1 Return on Equity

ROE is measured as the amount of net profit expressed as a proportion of shareholders equity. It reveals how much benefit a firm generates with the use of shareholders' funds. Shareholders are more concerned about how much a firm is earning on their equity investment. This method is highly used by both financial and non-financial institutions as a measure of profitability. This is the most important ratio for investors as explained by Gul, Irshad, and Zaman (2011). The following formula is used to calculate ROE;

$$ROE = \frac{Net\ income}{equity} \qquad (1)$$

3.4.2 Return on Assets

This is the ratio of NI to TA of a firm. It shows how profit is generated from the assets of firms. Return on asset is a basic measure of both financial and non-financial firms' profitability that correct for the size of the firm. Weston and Brigham (1997) states that the higher this ratio, the better the performance of the firm. The following formula is used to calculate ROA;

$$ROA = \frac{Net\ income}{asset} \qquad (2)$$

3.4.3 Tobin's Q

This ratio was introduced by James Tobin of the Yale University. He stated that, the total market value of all companies listed on a stock exchange market should be

approximately equal to their replacement cost (Opoku, Adu and Anarfi, (2012). This ratio can be calculated as follows;

$$tobin's\ Q\ Ratio = \frac{market\ value\ of\ equity + market\ value\ of\ liabilities}{total\ assets} \quad (3)$$

The market value of liabilities is usually taken to be equal to the book value of equities. A Q ratio that lies between 0 and 1 means that, the cost to restore a firms asset is more than the worth of its shares. This means that the intrinsic value of the share is less than the market value for the shares. On the contrary, a Q value which is above one means that the firm's stock cost more than what the market will pay for the shares (Opoku et al; 2012).

3.5 Independent Variables

3.5.1 Total Debt Ratio

This ratio measures firms' total liabilities as a proportion of its total assets. This shows the firm's ability to pay off its obligations with it assets. This ratio helps investors to be able to analyze their overall debt burden, the lower the ratio, the better. The following formula is used for it calculation.

$$Total\ Debt\ Ratio = \frac{Total\ liabilities}{Total\ assets} \quad (6)$$

3.5.2 Long Term Debt Ratio

This ratio shows the percentage of a firm's asset that is financed with debts which have a maturity date of more than one. It gives a measure of the financial situation of a firm which includes its capability to meet it outstanding financial obligations. A decrease in this ratio as years go by indicates that the firm is less dependent on debts as a source of finance. The formula used to calculate this ratio is as follows;

$$Long\ term\ debt\ ratio = \frac{Long\ term\ debt}{TA} \quad (4)$$

3.5.3 Short Term Debt Ratio

This ratio shows outstanding liabilities that are due to be paid within one year. This means that the due date of payment for such liabilities is less than one year from the initial. It measures the financial capability of a firm to meet its temporary obligations from its assets. It can be calculated as follows;

$$Short\ term\ debt\ ratio = \frac{short\ term\ liabilities}{total\ assets} \quad (5)$$

3.5.4 Debt to Equity Ratio

This ratio is used to determine how good the statement of financial position of a company is. The main use of this ratio is to compare a firm's total debt to its total equity. It shows the proportion of a firm's total finance that comes from shareholders. When this ratio is high, it means more debts are used in financing than shareholders equity. A company that is finance completely with the use of equity is known as an unlevered company. The greater the ratio, the more levered is the company. This increases the possibility of bankruptcy,(Amy Gallo,2015).

$$Debt\ to\ equity\ ratio = \frac{total\ debt}{total\ equity} \quad (7)$$

3.5.5 Size

Size is used in this study as a control variable. By holding the variable (size) constant, the relationship among other variables used in the study is better understood. Previous researches have revealed that size of a firm is related to its leverage ratios. Large firms are usually considered to be highly levered than small firms. This is because bankruptcy is less common with large firms than with small

firms Titman, S. and Wessels, (1988). The log of asset has been used as an indicator of size.

Table 5: Summary table for all variables

Variables	Dependent	Independent	Abbreviation
Return on Equity	X		ROE
Return on Asset	X		ROA
Tobin's Q	X		QR
Total debts to assets ratio		X	TDR
Long term debts to assets ratio		X	LTDR
Short term debts to assets ratio		X	STDR
Debts to Equity Ratio		X	DTE
Size		X	Lnasset

3.6 Descriptive Statistics

According to William (2006), descriptive statistics is an analytical tool used to describe the main features of the data in a study by providing an understanding of the variables used. Mean, median, maximum, minimum and standard deviation have been used in this study as descriptive statistics tool.

All variables used for this study to analyze the impact of capital structure on firm performance as earlier discussed are presented on the following table. The descriptive statistics of the whole sample is presented on the table below in order to provide a brief summary of the results. From table 3.1, long term debt ratio changes

from 0 to 0.9531. this means that, out of the thirty firms used for this study, there are some firms which are not levered (equity financed) and others that are highly levered (debt financed). The mean of the LTDR to asset ratio is 0.2288. This means that, approximately 23% of the assets of the chosen firms are provided with the use of long term debt. The standard deviation reflects variations from the mean. For LTDR, it is 21 percent which is very close to the mean. STDR ratio changes from 0 to 0.6275 with a mean value of 0.1157. This means that 11.6% of the assets of the chosen firms are provided with the use of STDR. A combination of LTDR and STDR will give the total debt ratio. TDR changes from 0.003 to 0.9551. As earlier said, this means that out of the sample of firms chosen, some are highly levered while others are not. The mean of the TDR ratio is 0.3024 which indicates that about 30 percent of firms assets are provided with the use of debts of various categories.

In terms of performance, the results for the sample of firms used indicate that, shareholders benefited a return on average of 23.39 percent on each share held. From 2009 to 2014, some SA firms generate a return on asset as high as 132 percent while other firms realize a loss down to -104 percent. This loses could be related to the economic instability in the economy which has led to an increase in the rate of inflation. The standard deviation of ROE which is a measure of profitability is 27%. Comparing this value with the mean, it can be seen that firms have a low return of 23% when compared to the associate risk (standard deviation is a measure of volatility). This can be attributed to economic instability in the economy following the global financial crises. The ROA which measures how efficiently firms use their assets has a mean of 0.1227. This shows that for every dollar worth of asset of firms, 12.2% was earned as profit after tax.

Table 6: Statistical analysis between 2009 and 2014

Variables	Observations	Mean	Med	Max	Min	Standard deviation
LTDR	180	0.2288	0.18045	0.953	0.000	0.2097
STDR	180	0.1157	0.08003	0.6275	0.000	0.1294
TDR	180	0.3024	0.28285	0.9551	0.003	0.2011
D/E	180	0.688	0.47545	2.75	0.0085	18.166
SIZE	180	17.0077	17.3318	20.1842	10.6614	1.8646
ROE	180	0.2339	0.20005	1.3232	-1.0432	0.2726
ROA	180	0.1227	0.1077	0.873	-0.1846	0.1092
Q ratio	180	5.5487	2.121903	5.711	0.2234	12.5664

The D/E ratio changes from 0.0085 to 2.75 within the stated time interval with a mean value of 68 %. This shows that, on average, the firms depend more on debts than on equity as a source of financing. The Tobin's Q ratio lies in the range 0.22-5.71. This implies that, some firms are undervalued while others are overvalued. Tobin's Q equally has a median value of 2.12 which is greater than one. This implies that prices are above the competitive level. The mean value for Tobin's Q ratio is 5.7. This shows that firms maintain on average a very high market value. Also, the rate of return earned by firms is greater than the cost of its assets; Carlton and Jeffrey (2000).

3.6.1 Descriptive Statistics – Sectorial Order

As can be seen on the table below, the mean for return on equity has it lowest value in the healthcare and pharmaceutical sector with close to 9% of total equity and has its highest value from the telecommunication sector with almost 30%. Another important view is that the telecommunication sector has the least Tobin's Q value with a Q ratio average value of 0.94 while the mining sector has the highest average Q ratio value of 95.5%. Also, the healthcare and consumer product sectors have almost the same level of Q ratio with an average value of 1.04. TDR has the highest

mean value when compared with the TDR of the other sectors. In addition to the above, the average values for LTDR is higher than those of STDR for all the 5 sectors. This implies that SA firms use more of long term debts than short term debts. Healthcare sector have a very low mean value but with a very high standard deviation implying high level of risk in this sector of the economy.

Table 7: Statistical analysis by sectorial order between 2009 and 2014

Consumer goods	**Mean**	**Med**	**Max**	**Min**	**Stddev**
ROE	0.249	0.1988	0.9513	-0.0138	0.1719
ROA	0.118	0.101	0.873	0.0126	0.107
Q ratio	1.045	0.710	4.230	0.220	0.948
TDR	0.2924	0.314	0.6785	0.003	0.166
LTDR	0.2153	0.217	0.627	0.0019	0.1708
STDR	0.111	0.078	0.6148	0.00005	0.1151
D/E	0.7167	0.6659	2.2265	0.0185	0.4626
Telecommunication	**Mean**	**Med**	**Max**	**Min**	**Std. div.**
ROE	0.2950	0.2455	0.6606	0.0650	0.1955
ROA	0.1388	0.1215	0.2635	0.0557	0.0637
Q ratio	0.9416	0.940	1.18	0.470	0.2029
TDR	0.3317	0.3304	0.5178	0.2168	0.0806
LTDR	0.2651	0.2455	0.4007	0.1639	0.0644
STDR	0.1058	0.088	0.3372	0.021	0.0757
D/E	0.389	0.2848	1.1565	0.0085	0.3166
Healthcare	**Mean**	**Med**	**Max**	**Min**	**Std dev.**
ROE	0.088	0.189	0.4125	0.7960	0.289
ROA	0.1035	0.1088	0.2943	-0.1456	0.087
Q ratio	1.04	0.945	2.13	0.56	0.409
TDR	0.499	0.3904	0.955	0.1182	0.3099
LTDR	0.4140	0.2728	0.953	0.0014	0.360
STDR	0.1505	0.109	0.4169	0.0295	0.1149
D/E	0.30408	0.529	0.290	0.1355	0.629
Mining	**Mean**	**Med**	**Max**	**Min**	**Std dev.**

ROE	0.2518	0.1815	1.3235	-0.5518	0.3483
ROA	0.1431	0.1157	0.6398	-0.1848	0.1614
Q Ratio	1.9521	1.180	2.920	0.280	0.6291
TDR	0.1951	0.1378	0.5645	0.014	0.1374
LTDR	0.1560	0.1208	0.5492	0	0.1386
STDR	0.0516	0.022	0.3466	0	0.0715
D/E	0.3688	0.349	1.4602	0.0143	0.3115
Retail stores	**Mean**	**Med**	**Max**	**Min**	**Std dev.**
ROE	0.2306	0.2055	1.247	-1.3127	0.3125
ROA	0.1092	0.0975	0.2535	-0.0483	0.0600
Q Ratio	1.1202	0.7650	5.710	0.310	1.1508
TDR	0.3276	0.3066	0.9551	0.0482	0.2118
LTDR	0.2278	0.13155	0.953	0.0054	0.2310
STDR	0.1609	0.1223	0.6275	0.00014	0.1840
D/E	9.9434	0.44915	27.568	0.0511	43.227

3.7 Model Specifications

This research uses the linear regression model with three dependent variables and four independent variables. This makes a total of eight variables. Based on the fact that there are three dependent variables, three different linear equations will be used. In the first equation, ROE will be the dependent variable while in the second and third equation, ROA, and Tobin's Q ratios will be the dependent variables respectively. Each equation aims to explain the effect of the independent variable on the dependent variable. A simple linear equation model can be expressed as follow:

$$Yit = \alpha + Bx_{i,t} + \mu_{i,t} \quad (1)$$

Where:

Yit represent the dependent variable (i) at time (t) in the model

α represents the intercept of the equation

β represents the coefficient

Xit represent the independent variable (i) at time (t)

μ represents the error term.

This study is not based on the simple linear regression model which is based on one dependent variable and one independent variable. Instead, it is based on the multiple regression panel data model since it has more than one independent variable. The following models will be used in this study for ROE, ROA, and EBIT:

$$ROE_{i,t} = \alpha + \beta 1TDR_{i,t} + \beta 2 + LTDR_{i,t} + \beta 3STDR_{i,t} + \beta 4LnTA_{I,t} + \beta 5D/E_{i,t} + \mu_{I,t} \quad (2)$$

$$ROA_{i,t} = \alpha + \beta 1TDR_{i,t} + \beta 2 + LTDR_{i,t} + \beta 3STDR_{i,t} + \beta 4LnTA_{I,t} + \beta 5D/E_{i,t} + \mu_{I,t} \quad (3)$$

$$\text{Tobin's } Q_{i,t} = \alpha + \beta 1TDR_{i,t} + \beta 2 + LTDR_{i,t} + \beta 3STDR_{i,t} + \beta 4LnTA_{I,t} + \beta 5D/E_{i,t} + \mu_{I,t} \quad (4)$$

Where:

ROEi,t = return on equity ratio of firm (i) at period (t)

$ROA_{i,t}$ = return on assets ratio of firm (i) at period (t)

$LTDR_{i,t}$ = long term debt ratio for firm (i) at period (t)

$STDR_{i,t}$ = short term debt ratio for firm (i) at period (t)

$TDR_{i,t}$ = total debt ratio of firm (i) at period (t)

$\mu_{i,t}$ = error term for firm (i) at period (t)

β= constant coefficient

Note that we have used a pooled ordinary least square method in order to remove any heterogeneity between firms. We have equally made the assumption that the slope and the intercept are the same for all 30 firms used in this study.

3.8 Research Question, Hypothesis and Models

3.8.1 Research Question

What is the effect of capital structure on the performance of South Africa listed firms?

3.8.2 Research Hypothesis

The following hypotheses have been developed to answer the research question stated above. These hypotheses are similar to those used by Abor, (2005), and Salim and Yadav (2012).

Ho 1: A significant relationship exists between TDR and financial performance of firms listed on the JSE (ROE, ROA and Q ratio).

Ho 2: A significant relationship exists between long term debt ratio and financial performance of SA firms quoted on the JSE market (ROE, ROA and Q ratio).

Ho 3: There is a significant relationship between short term debt ratio and financial performance of firms listed in the JSE market (ROE, ROA and Q ratio).

Ho 4: Debt to Equity ratio has a significant relationship with the financial performance of firms listed on the JSE (ROE, ROA and Q ratio).

H_O 5: Size of a firm has an effect on the financial performance of firms listed on JSE (ROE, ROA and Q ratio).

3.9 Data Analysis and Technique

In order to analyze the data, unit root test is applied to test the statistical stationarity of the data. A data being stationary means that, it mean, variance, standard deviation, autocorrelation etc. are held constant with the passage of time. This makes forecasting very easy. In this aspect, various criteria have been used such as the Dicky Fuller, Levin Lin Chu, etc. The unit root tests for all variables used in this

study are presented in table 1 in the appendix which shows that all variables used are stationary.

Yair Mundlak (1978) suggests two alternative methods which could be used to analyze a sample made up of time series observations on a cross section. These two when added to the traditional pooled OLS method makes up a total of three methods which are explained bellow;

3.9.1 Pooled Regression Model

In this model, all observations are brought together in order to run the regression. Here, the cross section and time series nature of the data are ignored. The main problem with this method is that, it does not distinguish between the various companies used for the study. It assumes they have the same characteristics. In other words, by pooling the data we assume there is no heterogeneity among companies used. This does not exist in real life situations (Sayed Hussein, 2014).

3.9.2 Fixed Effect Model

This method allows for heterogeneity among companies used for the study by allowing each company to have its own intercept value. The fixed effect model is suitable to be used when it is believed that, there are omitted variables which correlate with the variables used in the model. This model is used as a means for controlling bias for the omitted variables. The model is referred to as fixed effect because of the fact that, even though the slope may not be the same across the various firms, the slope does not change with time. This means that, whatever effects the omitted variables have on the subject at one time, the same effect will be felt at a later time, (Williams, 2014). This model is designed to examine the cause of changes within companies that cannot be explained by constant time specifications.

3.9.3 Random Effects Model

This model assumes that all entities have a common mean value for the intercept. Random effect is usually considered to be more efficient because they produce narrower confidence interval than fixed effect model. The random effect model should be used if there is no relationship between the omitted variables and the explanatory variables. By doing so, unbiased estimates of the coefficients are produced, all the available data will be use, and the standard errors will be minimized. The random effect is equally suitable for models whose subject does not change across time. (Williams, 2014)

In order to decide which method will best suit the analysis of your data, Baltagi, (2005) suggest that the Housman test be applied. This test tests if the error term is correlated with the independent variable i.e. if the coefficients estimated from the model are statistically significant. The test is usually applied on the results from the random effect model. The null hypothesis of this test assumes that the random effect model is suitable while the alternate hypothesis assumes that the fixed effect model is suitable.

If the probability Value is less than 5 percent, we reject Ho implying the fixed effect model is appropriate; otherwise, we do not reject the null hypothesis.

Another test used in the analysis of data is the Durbin-Watson test which test for autocorrelation among variables. It is used to test if the model best fits to the data available. One assumption of the OLS regression analysis is that there should not be any auto correlation among the independent variables; Gujarati (2009). This means that the residual values should be randomly distributed. The desired value for the

absence of autocorrelation is 2. If the DW value approaches 2 from below, then there is the presence of positive autocorrelation and if it approaches 2 from above then there is the presence of negative autocorrelation.

This chapter focused on the data and methodology used for the study, the following chapter is based on the analysis of the results already highlighted in this chapter.

Chapter 4

EMPIRICAL RESULTS AND DISCUSSION

4.1 Introduction

This chapter will be based on the application of correlation and regression analysis on the data obtained for this study. The results will be presented and commented on as well while comparing the results with the empirical results of previous researchers.

In order to estimate the impact of capital structure on firm's performance, we use data obtained from Thomas Reuter's data stream for 30 listed firms in South Africa for the period 2009 to 2014. The initial data set is a balanced panel of30 companies and 180 0bservations.

4.2 Unit Root Test Result

According to the methodology explained in chapter 3, the results of Levin, Lin and Shu, Im, Pesaran and Shin W-stat, ADF- fisher chi-square and PP-Fisher chi-square at a level stationary test show that all variables used for the model have unit root which means that they are not stationary at a 5% level of significance. As such, we fail to reject thee null hypothesis. This means that the mean variance and covariance are not time invariant. In order to solve this problem, the first difference of variables is taken instead of level to run the test. The results of Levin, Lin and Shu, Im, Pesaran and Shin W-stat, ADF- fisher chi-square and PP-Fisher chi-square now show

that the Null hypothesis is rejected at a 5% level of significance. Hence variables are stationary.

4.3 Hausman Test Result

Based on the steps mentioned in chapter three, at a 5% level of significance, the Hausman test which is represented on the appendix reveals that the random effect model is appropriate for the three models used in this study. The probability values are significantly greater than 5 %(0.09, 0.96 and 0.28 for ROE, ROA and Q ratio respectively). As such, the null hypothesis is rejected. This means that the constant terms and the error terms are different for the companies selected from five different sectors.

4.4 Correlation Analysis

Correlation analysis describes how strong a relationship could be between two variables (Muhammad, Shah, and Islam 2014). In order to test the multicollinearity problem in the sample, we carry out a correlation analysis. By multicollinearity, we mean a situation whereby two or more independent variables are correlated with individuals. Remember that, in a multiple regression study, one of the assumptions is that the independent variables are independent of each other i.e. they shouldn't depend on one another. Only the Y variable should be dependent on the X variables. This implies that each of the independent variables carry a unique information about the dependent variable. However, when multicollinearity exists β_1 will no longer be a change in Y for a unit change in X_1 with $X_2 \ldots X_n$ held constant (Gujarati, 2009).

The presence of multicollinearity among variables in a model may have the following effect;

- There will be an inflation effect on the values of variances and standard errors.
- The size of the regression coefficient results may not be same as the expected results.
- The signs of the actual regression coefficients may be different from what is expected.

This problem may be resolved by adding more observations, dropping one of the independent variables or by developing a new proxy through the combination of the correlated variables (Gujarati, 2009). The Pearson correlation coefficient matrix for this study is presented bellow;

Table 8: Pearson correlation coefficients from 2009 to 2014

	ROE	ROA	Q Ratio	TDR	LTDR	STDR	TA	D/E
ROE	1							
ROA	0.7514***	1						
Q ratio	-0.0620	0.0062	1					
TDR	-0.2814***	-0.319***	-0.3276***	1				
LTDR	-0.2979***	-0.2977***	-0.2672***	0.7362***	1			
STDR	0.0492	-0.0559	-0.1364**	0.2419***	-0.102*	1		
TA	-0.0226	-0.10919	-0.0774	0.2619***	0.2943***	-0.1316**	1	
D/E	0.1636**	-0.00212	-0.3216***	0.1736**	0.1878**	-0.0238	0.01713	1

** Correlation is significant at the 10% level,*
*** Correlation is significant at the 5% level,*
**** Correlation is significant at the 1% level*

Based on the results from the table above, it can be concluded that there is the absence of multicollinearity as all the coefficients are less than 0.8.(Lewis-Beck, 1993)[1]. It can be seen from table 4.1 that, LTDR is negatively correlated with STDR but positively correlated with TDR and D/E. STDR is positively correlated with TDR but negatively correlated with D/E (debt to equity ratio). D/E is positively correlated with TDR and LTDR but negatively correlated with STDR.

4.5 Regression Outcome

The results for the regression analysis for ROE as introduced in chapter 3 are presented in table 4.2. The R Squared value for this model is 0.64. This means that, only 64 percent of ROE can be explained by variations in debt and equity ratios. 36 percent can be explained by other variables which are not used in the model. The Durbin Watson (DW) statistics check for autocorrelation in the model as explained in the previous chapter. The DW value for this model is 2.1 which is very close to two implying that, there is no autocorrelation in the model. This value is acceptable. The F-test which measures the presence of a linear relationship between the dependent and the independent variable (Maxwell and Kehinde, 2012) has a value of 7.67 with the prob. Value of 0.00000 shows that the model is a good one. This shows that, this model can be used for decision making.

[1] Some argue that the benchmark for determining multicollinearity is 0.5 and not 0.8. In this study, we adapt widely referred and accepted benchmark of 0.8.

Table 9: ROE regression model for the time Interval from 2009 to 2014

Variables	Coefficients	Standard error	Probability values
C	0.6838 (0.7982)	0.8566	0.4260
TDR	-1.7391* (-1.7865)	0.9734	0.0761
LTDR	0.6932 (0.7775)	0.8915	0.4381
STDR	0.5897 (1..15083)	0.5125	0.2510
LNTA	-0.0092 (-0.1831)	0.0550	0.8550
D/E	-0.00265 *** (3.3393)	0.00079	0.0011

*R-Squared=0.64, DW=2.14, F-statistics=7.67, prob (F-statistic) = 0.00000. *, **, *** show that coefficients are significant at 10 percent, 5 percent and 1 percent respectively. The values in bracket are t- statistic.*

Table 10: ROA regression model for the time interval from 2009 to 2014

Variables	Coefficient	Standard error	Prob. Value
C	0.4067 (1.0967)	0.3706	0.2743
TDR	-0.6375 (-1.5137)	0.4212	0.1323
LTDR	0.3760 (0.9749)	0.3857	0.3312
STDR	0.2313 (1.0433)	0.2217	0.2985
LNTA	-0.0119 (-0.5496)	0.0218	0.5834
D/E	-0.0019 (0.5545)	0.00034	0.5800

R-Squared=0.87, DW=1.37, F-statistics=29, prob (F-statistic) =0.00000. T-statistic values are shown in bracket

Table 11: Tobin's Q ratio regression model for the time interval 2009-2014

Variable	Coefficient	Standard error	Prob. Value
C	8.932 (3.74406)	0.3984	0.0002
TDR	-7.663803 (-0.55854)	3.72108	0.5772
LTDR	7.92176 (0.62997)	2.5748	0.5295
STDR	11.97648 ** (4.55355)	7.23045	0.0994
LNTA	-2.04137 *** (0.1795)	0.0986	0.0010
D/E	0.00483 (0.43156)	0.01119	0.6666

R-Squared=0.45, DW=1.833, F-statistics=6.34, prob (F-statistic) =0.00002.

, **, * shows that coefficients are significant at 10 percent, 5 percent and 1percent respectively.T-statistic values are shown in bracket.*

For ROA, the R-squared value is 0.58. This means that 58 percent of ROA can be explained by capital composition of the firms while the remaining 42 percent can be elaborated by variables not mentioned in the model. The DW value for this model is 1.58 which is very close to 2 hence no autocorrelation between the variables.

For the Q ratio model, the R square value is 45 percent. This number is quite small but still acceptable. The DW value for this model is 1.83 which is acceptable.

The F-Test is usually used by researchers to compare the fitness of a model at hand with an intercept only model. The null hypothesis of the F test states that the fitness of the model being studied is equal to the fitness of the intercept only model i.e. all of the independent variables lack predictive power (Blackwell, 2008).

Based on the models of this study, the F-test has probability coefficient of 0.00. This means that the models are statistically significant at a 5percent level each.

The following section is out to explain the relationship between the variables used for this research and based on the results presented on the above tables. This section further explains how consistent these relationships are with the results of previous studies on this same topic.

4.5.1 Total Debt to Total Assets Ratio (TDR)

According to table 4.2, the ROE model shows that, there is a significant and negative relationship (α=10%) with a probability value for TDR of 0.076 between ROE and TDR. TDR carries a coefficient of -1.7391. This means that if total debt ratio increases by one unit, ROE will decrease by -1.7391. This result is in line with the pecking order theory which states that there is a negative relationship between debt and profitability. Based on this result, we fail to reject hypothesis 1 of this study which states that there is a negative relationship between TDR and firm performance. McConnell and Servaes, (1995) explained that a negative relationship between total debt and firm performance will exist for firms that experience a very high growth rate. The presences of debt in a firm's statement of financial position imply that the managers have future commitments to a fixed payment of interest and principal. Because of this, managers should avoid more debt inclined investments. Based on this result, we fail to reject hypothesis 1 of this study which states that total debt ratio has an inverse relationship with firm performance.

The pecking order theory further suggests that firms in many cases tend to use more of internal sources of finance and will only issue shares in extreme situations. This

result is similar with the previous results of Frank and Goyal (2004),Rajan and Zingales (1995), and the work of Ramjee and Gwatidzo, (2012).

Based on the ROA model, as presented on tables 4.3, TDR has an insignificant relationship with the ROA (it has a probability value of 0.76). This is further justified by the t statistic value of -1.513. For the Q ratio model, it can be noticed from table 4.4 that no important relationship can be found between the Q ratio and capital structure of firms.R. Zeitun and G. G. Tian, (2007) found similar results.

4.5.2 Long Term Debt to Total Asset Ratio (LTDR)

LTDR is used in this research as one of the independent variables. It is seen to have a positive but insignificant relationship with ROE which is a measure of profitability (α=0.69, t-statistic=0.78, probability value=0.43), ROA which is a measure of firm efficiency (α=0.37, t-statistic=0.97, probability value=0.) and the Q ratio for market performance (α=7.92, t-statistic=0.63, probability value=0.50). This result is in line with those of Khan (2012) who found an insignificant relation between ROE and firms performance in his study on the engineering sector of Pakistan. Also, Hasan, Ahsan and Alam (2014) equally found no link between LTDR and firm profitability. Looking at the Pearson correlation rank coefficient matrix, one will see a strong relationship between ROE and LTDR. This is not same with the regression results. The difference in results could come about as there are five different sectors used in the study with unrelated companies who have varying choices for either long term or short term debts.

4.5.3 Short Term Debt to Total Asset Ratio (STDR)

Another important factor used in many studies as a measure of capital composition of firms is the short term debt ratio. After running the regression analysis, it can be seen that, STDR has an insignificant relationship with the ROE and ROA models with

probability values of 0.25 and 0.29 respectively. On the contrary, it can be seen on table 4.4 that STDR has a positive and significant relationship with Tobin's Q ratio at a 10 percent level of significance, with a probability value of 0.0994. This implies that as total STDR ratio of firms' increases, the Q ratio gets better. This is in line with the previous study of R. Zeitun and G. G. Tian, (2007). The usual phenomenon is that, a negative relationship is expected between the Tobin's q ratio and STDR. The positive relationship from this work can be due to the fact that most of the companies used rely more on short term debt like the retail and store sector and consumer product sector. They cover more than fifty percent of the data used for this study.

4.5.4 Debt to Equity Ratio (D/E)

As explained in chapter 3, the debt to equity ratio is used to compare a firm's total debt to its total equity. Base on the regression results of the ROE, ROA, and Q Ratio models presented on tables 4.2, 4.3, and 4.4, it can be seen that seen that, D/E has an inverse and significant relationship with ROE, at α level of 1% (probability value of 0.0011). This relationship implies that, as debt to equity of a firm increases, firm profitability decreases by 0.0026. This result is similar to that of Salim and Yadav, (2002) who equally found a negative relationship between ROE and D/E ratio in their studies. Consequently, we fail to reject null hypothesis 4 that D/E ratio has a significant relationship with firms' value. D/E ratio has an insignificant relationship with ROA and Tobin's Q ratio Ratios as shown by regression results with α=-0.0019, t-statistic=0.5545, probability value=0.5800 and α=-0.00048, t-statistic=0.4315, probability value=0.6666 for ROA and Q ratio respectively.

4.5.5 Control Variable

Finally, it can be seen from the results of the various models that, ROE and ROA as measures of firm performance have no significant relationship with the control variable Size with probability values of 0.855 and 0.583 respectively. That is an increase or decrease in total assets has no significant effect on firm performance Salim and Yadav, (2002). But Tobin's Q ratio is seen to have a negative and significant relationship with the size of firms at a 1 percent level of significance with a probability value of 0.0010. This means that, as firm size increases, Tobin's Q ratio decreases. Base on this result, we fail to reject null hypothesis 5.

Chapter 5

CONCLUSION AND RECCOMENDATION

Based on a sample of 30 SA firms, we tested the effect of capital composition on firm performance. Despite the numerous previous studies that have been carried out in order to come up with an optimal capital composition for firms, an agreement has not been reached at implying that more work still need to be done. This is explained in the latter parts of this chapter.

5.1 Conclusion

On a specimen of 30 South African quoted firms from five different sectors, this study has tested the impact of capital structure on firm performance by using TDR, LTDR, STDR and debt/ equity ratio as measures of capital structure. It equally used size as a control variable. On the other hand, return on equity, return on assets and Tobin's Q (Q ratio) ratios have been used as measures of firm performance.

According to the descriptive statistics of this study, the debt to equity has an average value of 0.68 implying that, there is 98cents in debt for every 1dollar invested in equity. This value is high implying that SA firms depend on debts as much as they depend on equity as a means of financing. This is typical of developing countries of which SA is among. This can be justified by the presence of many financial institutions that are readily available to provide loans for the firms in need. ROE has a mean value of 0.233 which is the highest mean value for the dependent variables.

This shows that on average, shareholders are assured to have on average a return of about 23 percent from their investments.

The random effect panel data model has been used to test the link between capital composition and firm performance. The results show that, ROE and Q ratios are good models which can be used to test the impact of capital structure on firm performance as can be seen on the regression tables in the previous chapter. ROA is proven to be insignificant to a greater extent in studying the impact of capital structure on firm performance. Capital structure having an insignificant impact on ROA is in line with the Modigliani and Miller Irrelevance Proposition theory which states that, capital structure is irrelevant in the determination of a firm's value.

ROE has a negative and significant relationship with the TDR which means that as total debt to asset ratio decreases, ROE increases. The following explanations can be raised to explain this fact;

- The growth potentials of a growing economy like SA are very high. This means that, firms are likely to take more debts in order to finance their activities hence making a firm to be committed to future payment of interest plus the principal amount. This limits the firm's ability to invest in immediately available projects with a high positive net present value.

- There is a continuous increase in the level of inflation in the Economy of SA; this means that real interest rates will be very high therefore jeopardizing future financial stability.

This is in line with the pecking order theory which state that profitable firms will go for low level of debt while depending more on internal financing. ROA is seen to have an insignificant relationship with capital structure implying that, ROA does not have an impact on the value of a firm. Q ratio has a significant and negative relationship with Size of a firm and a positive and significant relationship with STDR.

Aside from the positive relationship between Tobin's Q and STDR, the general conclusion for this study is that capital structure has a negative impact on firms' performance which matches with the pecking order theory. Also, South African firms should concentrate more on ROE and Tobin's Q as measures of performance when analyzing the impact of capital structure on their performance as a significant relationship exist between them.

5.2 Limitations and Suggestions

This thesis made use of panel data in the analysis of results. Also, also, the model used only TDR, LTDR, STDR, debt to equity ratio and size as the independent variables while neglecting other explanatory variables such as equity to asset ratio, debt to capital ratio. Also, on the dependent variables side, EPS, Gross profit margin, EBIT which are equally good measures of performance have been neglected as well. Further research can be done by adding more independent variables to the above models or better still use different models. Moreover, this research focuses on the non-financial firms of South Africa. Further research can be conducted on the financial sector of not only South Africa but other countries as well.

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APPENDICES

Appendix A: The Results of Stationarity Test

Panel unit root test: Summary
Series: D(ROE)
Date: 10/29/16 Time: 10:57
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-16.6119	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.80024	0.0000	30	120
ADF - Fisher Chi-square	113.787	0.0000	30	120
PP - Fisher Chi-square	134.024	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi - square distribution. All other tests assume asymptotic normality.*

Panel unit root test: Summary
Series: D(ROA)
Date: 10/29/16 Time: 10:58
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-18.4629	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.39608	0.0000	30	120
ADF - Fisher Chi-square	117.792	0.0000	30	120
PP - Fisher Chi-square	143.172	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.*

Panel unit root test: Summary
Series: D(QRATIO)
Date: 10/29/16 Time: 10:59
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-14.2937	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.35036	0.0000	30	120
ADF - Fisher Chi-square	90.6745	0.0064	30	120
PP - Fisher Chi-square	105.791	0.0002	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi - square distribution. All other tests assume asymptotic normality.*

Panel unit root test: Summary
Series: D(TDR)
Date: 10/29/16 Time: 11:01
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.6612	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.29723	0.0000	30	120
ADF - Fisher Chi-square	108.848	0.0001	30	120
PP - Fisher Chi-square	124.191	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.*

Panel unit root test: Summary
Series: D(LTDR)
Date: 10/29/16 Time: 11:02
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-42.4878	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat s	-9.72786	0.0000	30	120
ADF - Fisher Chi-square	118.749	0.0000	30	120
PP - Fisher Chi-square	129.564	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.*

Panel unit root test: Summary
Series: D(STDR)
Date: 10/29/16 Time: 11:03
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-20.4187	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.20070	0.0000	30	120
ADF - Fisher Chi-square	142.277	0.0000	30	120
PP - Fisher Chi-square	184.808	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi - square distribution. All other tests assume asymptotic normality*

Panel unit root test: Summary
Series: D(DTE)
Date: 10/29/16 Time: 11:04
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.6403	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.37948	0.0000	30	120
ADF - Fisher Chi-square	98.3842	0.0013	30	120
PP - Fisher Chi-square	116.758	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi - square distribution. All other tests assume asymptotic normality*

Panel unit root test: Summary
Series: D(LNASSET)
Date: 10/29/16 Time: 11:06
Sample: 2009 2014
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.33848	0.0000	30	120
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.43369	0.0000	30	120
ADF - Fisher Chi-square	98.2101	0.0014	30	120
PP - Fisher Chi-square	132.020	0.0000	30	120

*** Probabilities for Fisher tests are computed using an asymptotic Chi - square distribution. All other tests assume asymptotic normality.*

Appendix B: Hausman Test Results

Variables	Chi sq. statistic	Chi sq. d.f.	Probability
ROE	9.4627	5	0.092
ROA	1.0312	5	0.960
Tobin's Q	6.1974	5	0.288

Appendix C: Regression Results

Cross-section random effects test equation:
Dependent Variable: ROE
Method: Panel Least Squares
Date: 08/20/16 Time: 07:14
Sample: 2009 2014
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.683862	0.856687	0.798264	0.4260
TDR	-1.739132	0.973488	-1.786495	0.0761
LTDR	0.693190	0.891574	0.777490	0.4381
STDR	0.589795	0.512495	1.150831	0.2517
DTE	0.002654	0.000795	3.339276	0.0011
LNTA	-0.009229	0.050402	-0.183107	0.8550

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.642895	Mean dependent var	0.233919
Adjusted R-squared	0.559160	S.D. dependent var	0.272639
S.E. of regression	0.181021	Akaike info criterion	-0.407745
Sum squared resid	4.751433	Schwarz criterion	0.213108
Log likelihood	71.69702	Hannan-Quinn criter.	-0.156016
F-statistic	7.677735	Durbin-Watson stat	2.146429
Prob(F-statistic)	0.000000		

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 08/20/16 Time: 07:17
Sample: 2009 2014
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.198354	0.133183	1.489328	0.1382
TDR	-0.636244	0.400662	-1.587982	0.1141
LTDR	0.400554	0.369171	1.085009	0.2794
STDR	0.241420	0.213319	1.131730	0.2593
DTE	0.000232	0.000326	0.710805	0.4782
LNTA	-0.000161	0.007971	-0.020144	0.9840

Effects Specification		
	S.D.	Rho
Cross-section random	0.076291	0.4869
Idiosyncratic random	0.078319	0.5131

Weighted Statistics

R-squared	0.094553	Mean dependent var	0.047448
Adjusted R-squared	0.068534	S.D. dependent var	0.080218
S.E. of regression	0.077421	Sum squared resid	1.042950
F-statistic	3.634059	Durbin-Watson stat	1.356866
Prob(F-statistic)	0.003752		

Dependent Variable: Q RATIO
Method: Panel EGLS (Cross-section random effects)
Date: 10/17/16 Time: 14:22
Sample: 2009 2014
Periods included: 6
Cross-sections included: 30
Total panel (balanced) observations: 180
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	38.93247	10.39844	3.744067	0.0002
TDR	-7.663803	13.72108	-0.558542	0.5772
LTDR	7.921762	12.57480	0.629971	0.5295
STDR	11.97648	7.230459	1.656393	0.0994
LNASSET	-2.013352	0.601310	-3.348274	0.0010
DTE	0.004831	0.011193	0.431566	0.6666

Effects Specification	S.D.	Rho
Cross-section random	11.09714	0.9494
Idiosyncratic random	2.560760	0.0506

Weighted Statistics

R-squared	0.454149	Mean dependent var	0.520428
Adjusted R-squared	0.429843	S.D. dependent var	2.739067
S.E. of regression	2.555063	Sum squared resid	1135.933
F-statistic	6.341978	Durbin-Watson stat	1.738043
Prob(F-statistic)	0.000020		