# EFFECT OF USE OF DEBT FINANCING ON THE SOLVENCY POSITION OF NON-FINANCIAL PUBLIC LISTED FIRMS IN KENYA

**BY**

**RAPHAEL ONDURU AMEK**

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## DECLARATION

I declare that this research project is my original work and has never been submitted to any other institute for any academic purpose.

Sign……

Date…… 2/12/2020

**Raphael Onduru Amek**

**D63/10130/2018**

This research project has been submitted for presentation purposes with my approval as University of Nairobi supervisor.

Sign……

Date…… 2ND DEC 2020

**Mr. James M. Nganga**

**Supervisor, University of Nairobi**

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## DEDICATION

I dedicate this research project to my beloved father Eng. Patrick Amek and my dear mother June Mbai as well as my siblings Remmy Michael, Sharon Amek, Nathan Odero and Avery Mbai. I also dedicate this research project to the entire Amek' family as a thank you to their words of encouragement and their support in my education and especially in this project work.

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| | |
|---|---|
| **ARM** | Athi River Mining |
| **CBK** | Central Bank of Kenya |
| **NSE** | Nairobi Securities Exchange |
| **PLC** | Public Limited Company |

## ABSTRACT

Business continuity is very critical and is a concern for every business stakeholder. There are several indicators of the business continuity but solvency position is a good estimator and predictor of a company's ability to continue operating as a going concern. This research sought to determine how use of debt influences the solvency position with a view to advising business managers on the most appropriate measures. The debt, which was measured using the natural logarithm of the amount of liabilities of a company use, was analyzed together with levels of business activity, board diversity and levels of competition as advised by previous literature review. The study established that the use of debt affects the solvency position of a company by a great margin. The coefficient of relationship was -14.36 showing that high debt levels have a negative effect on solvency position. The results were significant at a 5% significance level. The other variable was board diversity, which was measured by the proportion of non-executive directors in the boards of the listed companies, and has been found to affect solvency position positively. This shows that diversity in the board is good for a business to remain as a going concern. The coefficient of relationship was 0.010615 which was however insignificant. On competition levels, which was indicated by the number of firms operating in the same industry, the study has established a negative significant effect with a coefficient of -4.7809 and a p-value of 0.001. This indicates that the higher the competition, the more likely that a business will run in to solvency problems. Business activity as measured by volumes of revenues has been found to have a positive effect on solvency. This finding shows that firms should strive to generate more revenues as this would improve their likelihood of remaining as a going concern. The coefficient was 6.89 and the effect is significant with a p-value of 0.000. The constant of the equation linking the variables to the solvency of a company is 169.76 and the factors have been found to account for roughly 16.29% of the changes in solvency position as indicated by the R2 of 0.1629. Based on the findings of this study, it is advisable to use moderate levels of debt and cautiously to avoid diluting the solvency positions of companies. It is also advisable to diversify the board by having a greater proportion of non-executive directors but it needs further evaluation and caution as it has been found to be insignificant. It is also a recommendation that companies take measures to reduce the effects of competition and probably by diversifying so that they cushion themselves from the negative influence. Measures should also be taken to advance business activities to generate more revenues, which will facilitate an improvement in the company solvency position. Further researches needs also to be done to understand why the relations are as they are to understand what can be done to make them favorable.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

Borrowing, which results to debt, can be considered to be as old as human kind. From the ancient shylocks to the parable of the unforgiving servant in the bible as seen in Mathew 18: 23-35 (King James Version). Their stories also indicate that, constraining effects of debt use are not new but have been there. Conflicting scenarios are witnessed today with some companies succeeding with debt in their balance sheets while others collapsing and being put into administration due to default on loans and accounts payable to suppliers. This situation shows that there are chances of either way in use of debt, but depending on some prevailing conditions. In financing, both debt and equity are considered depending on the prevailing conditions and possible effects to the company operations (Mutua, 2019). Based on Debt theory by Innes (2004), debt use is expected to have a positive impact on company growth and sustainability provided proper analysis is done and there are genuine reasons behind borrowing.

Theories have been developed, and continues to be developed exploring the issues of both debt and solvency. The theories are however not exhaustive as businesses and business environments are very diverse and their conditions, being dynamic keeps on changing from time to time. This makes the theories become lacking in one aspect or the other. They are however very informing, making their consideration in this study very paramount. Debt Theory of Innes (2004) shed a lot of light in debt use. It advises borrowers to keenly consider the effects of debts and their implications before going for debt. The theory also emphasizes that the effects may be different depending on reasons behind the borrowing and also denotes that it is highly probable that business growth will be felt under use of debt. The Theory of Debt Overhang by Myer (1977) will also be

considered in this study as it cautions against huge amounts of debt which brings about repayment problems. The other theories, which were considered, are the Credibility Theory of Mowbray (1914) and the Theory of Corporate Financial Decisions with Liquidity and Solvency Concerns of Gryglewicz (2011). Both theories are relevant as they present more concerns, which can affect solvency position in addition to debt use.

Firms, which collapse, do so because of their inability to sustain themselves in the long run. The world has seen several businesses across all industries fall of late, suggesting that solvency issues are not prone to specific industries only. Spencon (construction industry), Nakumatt (wholesale business), Kenya Airways (aviation), Intercontinental Hotel (hospitality industry) and Eveready East Africa are just but a few examples of companies, which have either collapsed or are evidently struggling to survive. A study by Mutua (2019) indicated that use of debt (interest bearing) had a positive effect on financial performance, which is an indicator of a positive impact on the solvency position of firms. This proposition contradicts an earlier one by Ringui (2016) that debt use exposes a business to the risk of solvency. These contradicting findings, together with others forms a justification for a newer study with a focus to all debt and solvency position, and taking into account other expected control variables identified through review of literature.

### 1.1.1 Use of Debt

Chen (2020) defines debt as an amount of money borrowed by one party from another. It is therefore a form of financing where one uses funds from parties external to the business. Mostly, debt attracts interest, which is a cost to the business. The company on the other hand benefits by having funds and investing in projects, it would otherwise not have managed to (Chen, 2020). According to Kerrigan (2014), debt is one of the ways of financing a business, which compliments the use of equity. Because of the double edged nature of debt, it is thus very critical for managers

to determine appropriately what could be the impact, on their company operations, of use of debt. This is possible through rigorous studies like this one whose conclusions forms the basis for considerations by interested parties.

Some of the impact on debt on company parameters are positive while others are negative. On the textile industry, a study by Shaheen and Malik (2012) established that debt exposed such firms to more risks. This shows a negative effect thus advising managers to shy off from debt. Another study by Akbar, Rehman and Ormrod (2013) found that long term debt was more favorable than short term debt in financing business operations. This shows that not just debt but also its nature has effects of business sustainability hence solvency position. In Kenya, Chesang (2017) established that debt consumption affected solvency position negatively, a conclusion which conflicted Ringui (2016) who established that debt increased risk in the business hence affecting its solvency position negatively.

Regardless of these conflicting findings, and bearing in mind findings that the nature of debt and other factors could affect solvency position in a business, it is almost clear debt use will continue to be experienced. What is important then becomes studying debt in some confined conditions and determining its effect on solvency. For this study, the focus was on public listed non-financial firms in Kenya. Limiting to a small population ensures a more precise conclusion as most of other factors which could have influenced the study like interest rates, inflation rates, political climates and exchange rates among others are held constant. This ensures a more focused study which can appropriately advise managers in firms with the same conditions. In measuring debt use, one can use levels of interest payments as advised by Mutua (2019), or use the absolute values of liabilities in the balance sheets of businesses. Researchers can also segregate the date and study short term and long term separately. In this study, the total debt as shown by liabilities in the balance sheet

would be used to measure the levels of debt use.

### 1.1.2 Solvency Position

Solvency is the ability of a business to meet its long term obligations (Corporate Finance Institute, n.d). It directly relates to the long term business sustainability and is closely intertwined with business performance as depicted by Walter (1957). Solvency ensures business continuity and growth, which is the prayer of any investor. Managers, acting for the benefit of the company shareholders under their agency relationship, would thus strive to ensure proper solvency position. This position would ensure that the interests of the shareholders are protected. It also indirectly meets the interests of other stakeholders who interact with the business like customers, employees and suppliers among others.

Being aware of the solvency position in a business should be a top priority. This is because business insolvency is never one of the intended fates in business establishments. It is very important for all company stakeholders to continually review their businesses solvency positions supplementing the same with trends to ensure that corrective measures are taken early enough to prevent business failure. Understanding the factors that can affect, and how they can affect a business solvency position thus becomes a good idea. Nguyena, Nguyen and Nguyen (2019) established that operating cash flows relative to total liabilities and net working capital relative to total assets affected solvency positions of businesses. Following the observation by Walter (1957) that solvency is intertwined with business performance, it then follows that all factors that can affect business performance are relevant in solvency. This situation leaves managers with a lot of factors to keep an eye on in an attempt to keep their businesses solvent. The good news is that they end up killing multiple birds with the same stone.

Solvency can be measured in different ways. Liquidity has been argued as a form of liquidity. To be more comprehensive and taking into consideration that long term obligations at some point become current, the study will incorporate short term liabilities in the study and hence will focus on total debt. This kind of an analysis will help avoid a shallow focus and focus on business continuity. Berk (2019) used ratios to measure solvency position in his study sample. The ratios are the debt equity ratio, the equity multiplier and the long term debt ratio. This study will use the solvency ratio as advised by Kenton (2020) which takes into account noncash outflows and total liabilities.

### 1.1.3 Debt Use and Solvency Position of a Company

It is evident that debt is one of the factors that contribute to the long term fate of a business, whether success or failure. Consequently, debt affects firms' solvency position either way, and subject to some conditions. These conditions are other factors, which interplay in solvency position like nature of management, their risk appetite, ownership structure, and diversity in the company board, competition levels and business activity ratios among other factors. The effect depends on what outweighs what between cost of debt together with its inconveniences in repayment and the benefits of having a potential to invest in projects and more precisely the returns from such projects. These factors will not act in isolation and there are multiple factors which play part in the solvency position. As a result of this diversity in factors, this study will focus on only 47 listed firms in Kenya to limit the possible factors, not considered, from swaying the study results in a deceiving manner. Considering that such firms account for almost ¾ of the firms listed in NSE, it would immensely contribute to a greater section of the economy.

The existing literature have provided diverse findings in respect of the use of debt and how it influences the solvency position of firms. With most of the researches establishing that there is a

negative relationship between the use of debt and solvency position as the level of debt was the major source of financial distress and hence insolvency. Such studies like Ringui (2016), Chesang (2017) and Songhor (2018) in Kenya agreed with the negative relationship for the two variables. This study finding were still in line with earlier studies of Orhangazi (2008) that found a negative relation as well as agreeing with the notion of Shaheen and Malik (2012) that found debt unhealthy for business. On the contrary Piot and Missonier-Piera (2009) established a positive relationship between the variables. Ebaid (2009) and Akbar, Rehman and Ormrod (2013) in their studies however, established that the two variables did not provide enough evidence to conclude that they were related. Such studies provide a stepping ground to initiate the enquiry on the relation between the use of debt and the solvency position of firms as it seems to be unclear.

In the study, quantitative data was obtained from secondary sources and regression analysis done in order to establish if used of debt as a financing option really affected the solvency position. Other factors expected to influence the effect of debt on solvency position was analyzed along. These factors are like the board composition, competition levels and business activity levels of the companies. Regression shall be suitable to establish the existence, direction and the significance of the relationship in that case. The study findings shall be helpful to the decision makers on determining the financing options to be utilized based on the impact they are to have on the solvency and going concern of the listed non-financial firms.

### 1.1.4 Non-financial Public Listed Firms in Kenya

In Kenya, public listing of companies is done by NSE, which ensures some conditions are met to safeguard the interests of company stakeholders. Listing gives some advantages, one of which is easier access to financing, including debt. In addition to offering an avenue for raising of finance (both debt and equity), NSE facilitates secondary trading of shares and facilitates collection of

market data (Mule & Mukras, 2015). Non-financial companies are those operating in other industries apart from in banking sector and insurance firms (Besho, 2019). In analyzing about debt, these firms are considered to be highly geared and poses chances of misleading conclusions. In total, public listed non-financial firms in Kenya are 47 in number (NSE, 2020).

Even though as pointed out by Besho (2019) that a close monitory is made by the capital market authority and the NSE itself, this has not been a guarantee of good practices within the firms. Having witnessed in the past collapse of some of this listed firms in the past like Atlas development and support services limited, and others going to the extent of making schemes of arrangement at the risk of bankruptcy like ARM cement PLC and Deacons (EA) PLC on the grounds of section 534(1) of the insolvency Act of 2015. This leaves it an area of interest that such firms should be considered in the discussion of the main factors that may affect solvency of non-financial firms listed in Nairobi stock exchange.

## 1.2 Research Problem

According to Denis (2019), shareholder wealth maximization remains an undisputed primary goal of a firm. For it to be achieved, all other stakeholder interests are considered and met. Achieving this goal requires management commitment to the good cause of the business and this makes it very necessary that every literature that can be availed on business continuity be done to assist in the noble cause. More importantly, there is need for more literature on debt and its effect on business solvency, which affects continuity. There is an evidence of a researchable gap in the listed firms in Kenya and especially for the non-financial firms as it relates to use of debt. This is partly due to the continued collapse of some businesses and the inadequacy of existing literature and theoretical literature. It is also because most of the research works have focused so much on broad areas limiting the applicability of their conclusions and recommendations in some instances.

Existing theories have also left some gaps especially if narrowing down to some particular type of businesses is necessary. This has made Debt theory, Theory of Debt Overhang, credibility Theory and the Theory of Corporate Financial Decisions with Liquidity and Solvency Concerns inadequate in arresting the solvency problems which has overtime rocked some listed firms like Kenya Airways (before it was stopped from trading) and Uchumi Supermarkets.

Debt cost in Kenya has remained low in the recent past thanks to the capping done in 2016. Although the capping was intended to make debt cheap, according to CBK (2016), other characteristics of debt seems to have played part and made it hard to achieve the intended fruits. Smith (2019) indicates that IMF pressure ensured that Kenya reviewed the capping and abolished it to facilitate advancement of credit to the private sector. Although stringent guidelines have impended the actualization of the review, there has been a step towards the review, which facilitate credit (debt) availability to businesses. Regardless of the capping and its review with a focus to credit availability and affordability, most businesses have struggled to survive with many businesses closing doors. According to Some (2019), Intercontinental Hotel had difficulties with repayment of its debt to Stanbic Bank, which saw a disclosure be made to the Privatization Commission that the hotel was facing financial difficulties to the extent that it could not meet its obligations as they fell due. This disclosure fits in the definition that Intercontinental hotel was insolvent. Similar struggles are facing Tuskys Supermarkets, Kenya Airways and also Sameer Africa Ltd PLC.

Previous studies have yielded to some extend but the fact that businesses are still collapsing is an indication that there is a need for a more focused study and especially on debt. Piot & Missonier-Piera (2009) established that debt brings about existence of creditors who add to the monitoring of business operations and activities. This makes the management more vigilant and can thus lead to

a better solvency position for the business. Contrary, Ebaid (2009) downplayed the effect of debt on solvency position. He emphasized that, meeting of obligations were tied to the arrangements management make on how to meet them. Although the study was supported by the findings of Akbar, Rehman and Ormrod (2013), arrangements not supported by capability may not yield anything positive. These deficiencies in past researches have informed this research to seal the gap by being more focused and narrowing down to a smaller population for more accurate results.

Local studies like Ringui (2016) have established that debt affects solvency position non-financial listed firms negatively. These findings were echoed by Chesang (2017) who focused on agricultural firms and Songhor (2018) who studied all listed firms considering the time elapsed between now and the last closely done research, and considering that debt has continued to be used regardless of the findings, this research has become a necessity to try and confirm the results of the study. It is important to note that business environments are very dynamic and much might have changed since the last relevant research.

## 1.3 Research Objective

The objective of this study is to determine the effect of use of debt on the solvency position of non-financial public listed firms in Kenya.

## 1.4 Value of the Study

This study has a lot of benefits both in practice, policy and theory. Among the most beneficiaries are company management, company shareholders, company finance providers, government policy makers, students in higher learning institutions, lecturers and all other company stakeholders. In practice, managers are expected to be prudent in their decision making among them financing. Managers would use the results of this study to advise them when making debt related decisions

as they would be aware of how critical such decisions would be to the solvency position of their businesses. By knowing the direction and magnitude of the debt use effect to the long term sustainability of the company, managers would make appropriate decisions geared towards making the business more sustainable in the long run. Financiers would also benefit by determining the long term position of businesses before they finance them.

In terms of policy formulation, government officials and company policy makers would develop informed debt related policies. Company policy makers would develop policies to limit debt use if a negative effect has been found and encourage debt if positive effect to the long term position of the company has been established. Government policy makers especially in CBK, which regulates commercial banks, would develop better policies to encourage or limit debt use depending on the established relationship.

Another group to benefit is that needing and using theories in finance. These are like researchers, students and also lecturers in finance. Whereas researchers would get a referencing point, students and lecturers would expand their knowledge on effect of debt on the long term position of public non-financial companies. By adding to the existing knowledge, the study would have helped in expanding the theory surrounding debt and long term position and sustainability of businesses.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

This section of the study shall focus on the literature so far existing in respect of the impact of the use of debt financing on the solvency of the non-financial firms listed in Nairobi stock exchange. The chapter shall specifically cover a theoretical review, determinants of solvency position in firms, the empirical review, a conceptual framework and a summary of the literature review.

## 2.2 Theoretical Literature Review

In the theoretical literature review, the study shall consider existing theories that has been in connection with either of the variable in the study. In the attempt to achieve the research objectives, the study shall consider debt theory, theory of debt overhang, credibility theory and theory of corporate financial decisions with liquidity and solvency concerns as relevant for the study.

### 2.2.1 Debt Theory

The debt theory is attributed to the work of Innes (2004) in whose theory attempted to connect the relation between debt and money. The theory argued that debt magnitude could be a major concern of the real operations in the business world. While debt is almost a necessity if the aspect of business and growth will be realized, the implications of debt and its magnitude in the business should be keenly considered. The theory assumed that holding other things constant, the level of debt will differ from one institution to another depending on the risk appetite as well as the reason behind the borrowing.

In the attempt to understand the concept of debt, there is a need to analyze the structure of the business and the industry it operates in. according to Wray (2004), institutions have been seen to

take different proportions of debt to finance projects that have a positive net present value. However, in his analysis of Innes theory of debt, Wray pointed out that the assumption of *ceteris paribus* did not hold to none exist forming the basis of debt theory criticism. In the reality, debt affects business in different ways but which is greatly influenced by other variables which cannot be separated from debt when being analyzed (Wray, 2004).

In the current study, the theory has been adopted due to its relevance in discussing the nature and effects of debt financing in the business. While the need for money is viewed as unlimited, the supply of money has been limited and therefore the debt concept comes into existence whenever the owner of a business attempts to fulfill the needs by borrowing money from lenders who are in lending business or has more resources to offer. Debt then becomes a common phenomenon in the business whether taken as short term or long term to finance spending deficit.

### 2.2.2 Theory of Debt Overhang

This theory of debt overhang developed by Myer (1977). The theory is based on the phenomenon of credit repayment problems that exist when an entity has too large debt that it cannot finance its debts. The firm may find it hard based on the financial strain to settle the debt but may arrange with the creditor to transfer the debt through promised payment for anticipated future cash inflows. Cordella, Ricci and Ruiz-Arranz (2010) viewed that in institutions or countries that face financial distress, the debt overhang is seen as irrelevant because this was an indicator of poor policy development within the institution and debt relief was not a guaranteed arrangement for such institutions.

From Borensztein (1990), it was viewed that debt overhang was acting as a disincentive in the operations of firms. This was in the case of Philistines market where overhanging was viewed to

shy away both local and foreign investors from the nation. While a country or firm may attempt to take an advantage over its financiers or creditors, the reputation associated with the debt overhang may have prolonged adverse implication to the future interactions with the creditors and other potential investors.

However, based on the Cordella, Ricci and Ruiz-Arranz (2010), the course of action to take place after the debt overhang is based on chances and therefore cannot be predicted by the firm or country making the assumption of the theory questionable. The theory shall be considered for the current study, based on the ability to point on the preference for debt in institutions. While debt may not be avoidable in the business operations, firms should try their level best to avoid overhanging on the debt to avoid tarnishing their reputation. Healthy businesses will borrow money when it is the best financing option based on the amount of returns and at the same time considering the repayment options.

### 2.2.3 Credibility Theory

The theory adopted by the work of Mowbray (1914). The theory was initially coined to fit the valuation of insurance premiums in terms of what should be offered to the insurance to cover the risk associated with the insured. According to the review by Longley-Cook (1962), the term credibility was originating from the measure of credence that would be purported sufficient to cater for the losses that where indented to be transferred. The theory was based on the resource that will be required to cushion the risk given some occurrence probabilities based on the experience. According to Goulet (1998), the insurer has to consider a resource that will be termed to be credible enough to cover the misfortune in case it occurs. From this, the theory is generalized to fit in the local operation in the consideration of decision making especially when it comes to obligations and how they shall be met.

In the course of the business the theory is applied in the operations of the financial institutions both the insurance firms and banks in the determination of either the premium for transfer of risk or the interest to be charged for the sacrifice of current spending to lend money. From the work of Sobel (1985), it is on the basis of the theory that individuals will move to the extent of trusting another person and whose motive to transact is not known. The proposition of his study established that the trust of an individual will be won through the actions of the other party that should have proven to deserve the trust. Based on this assumption, the current study considers the theory relevant as it explains the extent to which the solvency of a business in terms of the settlement of obligations as they fall due which in return creates the friendly atmosphere for future credit advances leading to less pressure in the business operations.

### 2.2.4 Theory of Corporate Financial Decisions with Liquidity and Solvency Concerns

The theory of corporate financial decision with liquidity and solvency concerns is one of the newest models in the field of financing and investments traced back from Gryglewicz (2011) in which the complex relationship between the liquidity and solvency of a firm were factored. According to the theory, a two-way relationship exists between the liquidity and solvency. As per Gryglewicz (2011) the change in the solvency level affected the liquidity level in a negative way in that an increase in the solvency level makes the business more trust worth to qualify for more debts from the providers. On the other hand, liquidity concerns were seen to affect solvency in a negative dimension in that when the firms experiences issues with its liquidity, this tends to strain the business and as a result the solvency position is adversely affected.

As per Yusoff (2017) there is undisputable importance of the solvency of the business. While the firm attempts to take investment opportunities in the profitable projects, they are expected to maintain a good liquidity ratio to ensure that the liabilities are settled with ease as and when they

fall due. On the contrary, some of the economist argue that the firms should use debt equity to finance the operations which will provide positive net present value. This implies that it is the responsibility of the decision makers to determine the equilibrium of the business to establish neither the amount of debt that should be used without compromising the investment opportunity nor the solvency level of the firm.

However, as reviewed by Zabolotnyy and Wasilewski (2019) the complexity of deciding the best proportion of debt and opportunities to be taken advantage over, are very unclear as preferences and risk are different from one project to another calling for more advancement in the model to address the same. The theory becomes relevant for the current study due to its ability to bring the picture of the relationship that exist between the debt levels as the independent variable of the current study and the solvency position of a business.

### 2.3 Determinants of Firm Solvency Position

This section off the study shall review other determinants that have been found to affect the solvency position of a firm. Some of the variables that have been considered to affect the solvency levels are level of business activity, board independence and the level of competition and they shall be reviewed under the section.

#### 2.3.1 Level of Business Activity

The level of business activity is a key determinant of the success of a business and considered as among the key factors that predict the going concern of a business. When a business records high level of business activities, there is life in the veins of the business and this normally give confidence to both internal and external stakeholders. This in return makes the business to be more committed as it endeavors to create a friendly environment for future relations, and which push

them to maintain a high level of solvency position at whichever cost. According to Baraja and Yosya (2019), the activity ratio, as measured using assets turnover, established to have a positive even though insignificant effect of the solvency position of firms.

According to Sessoms (n.d) he established that even though the element of performance as indicated by profitability was distinct from the aspect of firm's solvency, the two factor where closely linked. The report noted that even though a non-profitable firm may be still solvent, if the losses persist for some time, then the business would end up being insolvent. On the other hand, it was noted that it was on a rare occasion that a profitable business was seen to suffer solvency issues as the credit owners will be able to arrange for future recovery of their value based on the good will and trust of the firms (Sessoms, n.d). In the current study, the level of business activity shall be measured using the asset turnover ratio per year for the specific listed firm in consideration of the study.

### 2.3.2 Board Independence

Board independence is perceived as the extent to which the board members are not attached to the corporate operations. Based on the findings of Palaniappan (2017) the study found that the board independence and the frequency of board meetings had a positive moderate influence on the wellbeing of the firm. Businesses will do better with directors that are more independent because this normally reduces the conflict of interest in decision-making. This results to better decisions being made on issues relating to the shareholder's wealth maximization including the aspect of solvency as well as the value of the business. More firms have been seen to make the adjustment of the board operations to accommodate independent directors who have diverse management skills, good motive for the business and reduced cost, as they do not get much pay as fulltime directors resulting to better business operations (Palaniappan, 2017).

Based on the findings of Rehman and Shah (2013), it has been clear that the level of board independence influences the level of business performance in not only positive way but also in a significant manner. This was attributed to the fact that a board with more independent members made super ideas based on the concept of diverse mind and exposure to variant decision-making environment. In the current study, the variable shall be measure using the ratio of independent directors to the total board size in each year for the listed non-financial firms in the NSE.

### 2.3.3 Level of Competition

The level of competition in the market is a very diverse aspect in term of how it influences business operations. The competition has been seen to have both positive and negative influence on the operations of a specific industry. In one hand, competition benefits the firm, in that it will not have to bare all cost associated with research, and other firms in the industry will incur development in form of the research cost. Competition also boost the bargaining power for the industry to get some basic stake from the economy especially were planned competition exist, and high quality of performance as every firm try to increase its market share. From the Schuckmann (2007) point of view, an individual firm expects to benefit from the competition in the market but only to some extent. This called for regulatory bodies to regulate the extend of competition in the market but also not to allow monopoly in the market.

On the other hand, competition may have negative influence especially where the survival for the fittest attitude gets into the market leading into unfair competition. Under this case competition may end up leading to wastage of resources through lowered prices to attract customers, joyriding effect on the development investment and public goods resulting to poor environment for growth of the entire industry. According to Almarzoqi, Naceur and Scopelliti (2015) who investigated on the impact of competition on solvency of banking sector confirmed a negative relationship as

banks ended up being trapped in non-performing loans in the attempt to claim more market share that competitors and hence solvency problem. In the current study, the variable shall be measured by the use of the number of listed firms in the same industry.

### 2.4 Empirical Review

This section of the study reviews the existing literature on the effects of use of debt financing on solvency position of listed non-financial firms in Kenya. A number of studies have so far been done both from the local and global level. For instance, Orhangazi (2008) in the context of the United States in his study on financialization and capital accumulation established that there was a negative correlation between the use of external financing and the survival of the business. The study established that even though debt financing was readily available and promoted the preservation of the rights of the shareholders, it often exposed the firm to high commitment to settle the debt and accruing interest hence exposing the firm to future uncertainties (Orhangazi, 2008).

A study by Shaheen and Malik (2012) which sought to establish the determinants of debt financing in the Pakistan textile industry using descriptive statistics established that the use of debt financing exerted a pressure on the companies by exposing them to risk. According to the finding, firm size, profitability and capital intensity were the key factors that fueled debt financing. For such a reason, it was agreeable that debt financing was not so healthy for the industry and firms needed to work on the determinants so as to minimize the use of debt financing (Shaheen & Malik, 2012). However, study only established negative relation with the health of the firms in the industry but did note focus on to what extent this could lead to insolvency.

In the case of the United Kingdom, Akbar, Rehman and Ormrod (2013), who adopted a fixed effect

model methodology in investigating the impact of the financial crisis brought about by the credit contractions established that even though firm credit access was affected, the impact of the same could only be felt in the short term. The study further highlighted that credit contraction affected the performance of firms in a negative manner. Firms could be seen to substitute the short term debt with the long term debt to survive the crisis. The study findings brought a notion that the impact of the long term debt to the survival of firms could be contrary to the influence of the short term debt in the same sector calling for more investigation to be done on the same. This was based on the fact that long term debt had a friendly payment terms and which reduced the pressure exerted on the firms in commitment to repay the debt (Akbar, Rehman & Ormrod, 2013).

Some contradicting results from the previous studies in the context of French market established a positive relationship between the debt financing and the health of a business provided that the level of corporate governance was closely monitored (Piot & Missonier-Piera, 2009). This impact was attributed to the boost on the monitory which is brought about by the debt providers as they develop some interest in the firm as well as the tax shield brought about by the interest being a tax allowable expense as opposed to divided that are paid for the equity capital. However, good performance of firms is not a straight guarantee of solvency and thus calls for the current study to investigate the condition.

In the regional context, a study by Akomeah, Bentil and Musah (2018) in Ghana on the effect of capital structure on the firm performance denoted that performance was measured in respect of the shareholder's wellness. The study established that both the short term and long term debt where inversely related to the performance of the businesses based on the fact that interest reduced the claim of shareholders from the annual profits. It was thought that if a firm over relies on credit, and then its insolvency risk is increased to some extent. This is because if the firm is not making

much out of the debt obtained, the firm may develop financial distress and which exposes the firm to high risk of insolvency (Akomeah, Bentil & Musah, 2018).

In the study of Ebaid (2009) in the context of Egypt listed firms established that the use of the debt capital in financing the operations of business was not much influential on the survival of businesses. The study which seemed to be in support of the Modigliani and Miller concept of the irrelevance of capital structure, assumed that most of the firms which had variant capital structure shown evidence that the debt capital had influenced the performance of firms by chance and could not be directly linked to debt capital. However, the study was seen to contradict the findings of other researches calling for more investigations on the same.

In the local arena, Ringui (2016) sought to establish the relation between financial structure and firm's performance of financial performance of listed firms in NSE. The study pointed out that even though debt interest was a tax-deductible expense lowering the tax expense to maximize value of the firm, on the other hand, increase in the debt level was found to expose the firm to the risk of insolvency and hence threatening solvency of the business. The study found that the debt financing had a negative relationship with the solvency position and recommended that the managers should try to find an optimal ratio of debt to equity that fully takes advantage of tax benefit while on the other hand avoiding the risk of insolvency (Ringui, 2016). However, the study did not factor in solvency as a major variable as the current study will seek to establish.

From the study of Chesang (2017) it was clear from the research findings in the level of return that the increase in consumption of credit financing affected the solvency position in a negative way. The study pointed out that with no debt, the rate of return to the shareholders was quite appealing to the shareholders and which meant that the firm will be in a position to meet its liabilities with a

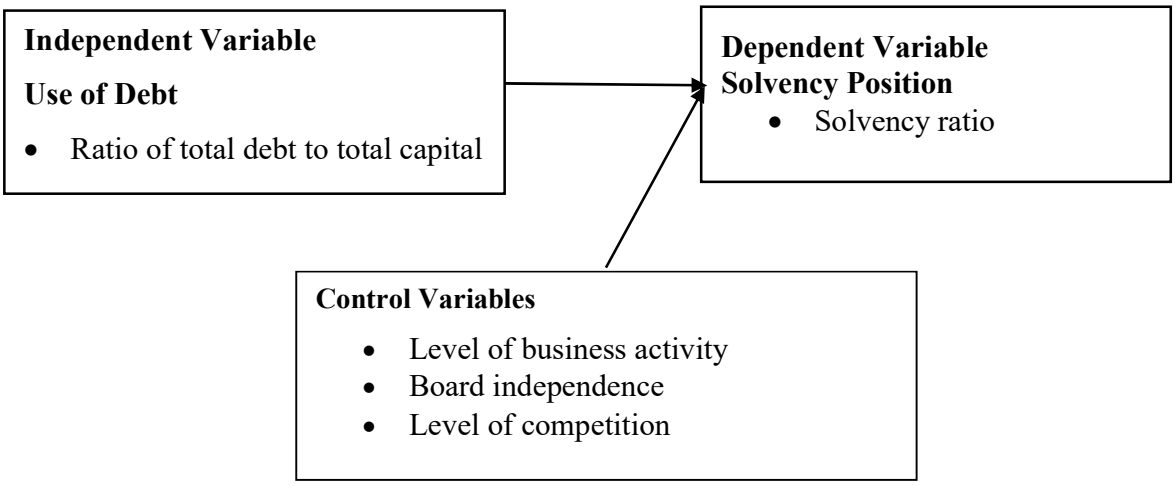
lot of ease. This hence boosts the solvency position and giving the business a good corporate image that lead to long-term growth of the business. The research however indicated that the relationship was insignificant deviating from Ringui (2016) whose results were significant and hence calling for clarification on the extent of the relationship.

Songhor (2018) in his study that adopted descriptive statistics found that the debt financing was having a negative correlation with financial distress. This implied that as the level of debt used to finance operations decrease resulted to a better secure environment it terms of pressure to meet obligations. The study concluded that solvency position was highly affected by the debt financing in an adverse way as debt was the main cause of insolvency. The study however seems to have concentrated on too many variables, which might have limited the accuracy and details of each investigation. It is based on this contraindication results ranging from negative to positive impact between the two variables that the study shall seek to establish the real relationship in the context of NSE.

### 2.5 Conceptual Framework

In this section, a brief review shall be done in regard to the relationship that exist between the use of debt in financing and solvency position as well as the other variable that may be affecting the solvency position of firms listed in the NSE. The diagrammatical representation shall show the direction of the relationship as well as the measurement of the two main variables use of debt and solvency position.

*Fig 2.1: Conceptual Framework*




***Source: Author (2020)***

## 2.6 Summary of Literature Review

Existing literature has been seen to have diverse evidence pertaining to the effect of debt financing on the solvency position of firms. Some of the studies have shown evidence of a positive relationship between the debt level and the solvency position of a firm like the study of Piot & Missonier-Piera (2009) which pointed that monitory brought about by the creditors will make the firm to be alert and always try to meet its obligation in due time. The study of Ebaid (2009) on the other hand was seen to imply that debt was not influential on the solvency position, as it was a matter of arranging on how to meet the obligation that did matter a study seen to be supported by the findings of Akbar, Rehman and Ormrod (2013).

Other studies have been seen to note that the use of debt financing was negatively affecting the solvency position both in the local and global context. For instance, Orhangazi (2008) found a negative relationship but whose significance was not defined. Shaheen and Malik (2012) only established that debt financing was unhealthy for firms but did not focus on to what extent it could affect solvency. In the Kenyan context, Ringui (2016), Chesang (2017) and Songhor (2018) all

established that debt financing was affecting solvency in a negative way but with different levels of significance. It is therefore, necessary for the current study to be conducted to establish the real effect of debt financing to the solvency position of non-financial firms listed in NSE.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

Kothari (2004) defined research methodology as the way to systematically solve a research problem. In methodology, the steps to be adopted in research together with their logic should be explored. In this chapter, the design adopted for the study together with the study population is outlined. In addition, data collection together with the various methods for confirming its validity are explored. The chapter will also disclose the intended data analysis procedure and the level of significance used in the study. Knowledge of these steps will go a long way in helping answer the research questions (Kumar, 2019).

## 3.2 Research Design

Research design is an outline for the collection and analysis of data and which seeks to combine relevance to the study objectives and economy in procedures (Kothari, 2004). Different research questions would need different research designs for the questions and objectives to be met with ease and more accurately. In meeting the objectives of this study, a quantitative research design would be used. This design will involve collection of quantitative data and which was analyzed through regression. According to Kothari (2004), a good research design should ensure highest yield of information at the least effort and the least expenditure in terms of cost and time. Black (1999) emphasized that a quantitative research design is more scientific in nature and is rigorous enough to provide valid conclusions.

## 3.3 Population

Population refer to the total of all members bound by the same characteristic. In this study, the

same characteristic is that, the firms should be listed publicly in Kenya and that they should be non-financial in their operations which are considered to have a normal gearing position (Akomeah, Bentil & Musah, 2018). There are 47 public listed non-financial firms in Kenya according to Kenyan capital markets authority. As public listed companies, their financial data is readily available to the public. Considering the small population size and the fact that their data is readily available, there would be no need to do sampling. The whole population will therefore be considered in the study.

### 3.4 Data Collection

All data collected was secondary and quantitative in nature. The data was collected from secondary sources by checking on the audited financial statements and the report to the shareholders of the companies. Data collected was for sales revenue, amounts of debt, total company financing, number of directors, and the number of firms operating in the same industry. This data will enable a precise determination of the level of business activity, the level of board independence and the level of competition. The data will also be adequate for determination of debt levels and solvency conditions of the companies under study. Considering that the statements have been audited by independent firms, the data is reliable and fit for use in analysis. Leek (2019) emphasised that good data should be valid and accurate.

### 3.5 Diagnostic Tests

Diagnostic tests were carried out on the data to ensure that it is free from any weaknesses and ensure correction if need be. Six diagnostic tests were carried out in line with the six assumptions of OLS. In the words of Berry (1993), understanding these assumptions helps a researcher in understanding and appreciating the weaknesses as well as the strengths in their estimates. The six tests which were carried out are for linearity, stationarity, multicollinearity, omitted variables,

autocorrelation and heteroscedasticity.

Linearity is the existence of a linear relationship between variables, in this case, the dependent and the independent variables. Linearity will be tested by plotting graphs of residuals against the predicted values of the dependent variable. If a violation of the assumption is noted, a correction would have been done by using ratios, natural logarithms or reviewing past literature to see identified relationship as advised by Osborne and Waters (2002).

Stationarity test was done to establish the behaviour of the means and variances over time as advised by Kantz and Schreiber (2004). This test was done by use of the ADF test and correction, if need be, was done through differencing. The correction is aimed at ensuring that the data is fit to avoid questionable regression results.

Multicollinearity, which is the existence of close relationships between some independent variables, will tested using the variance inflation factor. The interpretation was done by comparing the coefficients with 5 and correction was done by eliminating some of the closely related variables. Those, which would have been eliminated are those whose factor exceeds five.

Omitted variables in research were defined by Spanos (1995), as a situation where a factor, which could influence the dependent variable, is left out of the study. In this study, existence of missing variables was identified through running the Ramsey Reset Test. If found to exist, it was corrected by doing some literature review and include other relevant factors in the study or use proxy variables as advised by Wooldridge (2016).

Heteroscedasticity is the violation of homoscedasticity, which is the property of constant variation. This violation was observed by Kaufman (2013) to cause a distortion to the confidence intervals

which obviously leads to wrong conclusions. Breusch-Pagan test was used to test for heteroscedasticity in the data. Interpretation was done at 95% confidence level and correction was done through use of Robust Standard Errors.

Autocorrelation is the relationship which can exist between the error terms of subsequent years. The relationship can either be in 1st order or higher order. Autocorrelation was tested using Durbin Watson and correction was done using robust standard errors.

### 3.6 Data Analysis

Data analysis is the manipulation of data to extract the required information. After confirming data validity and reliability through diagnostic tests, statistical manipulation on the data was done through regression.

#### 3.6.1 Analytical Research Model

In data analysis, the equation below was used for regression;

$$Y_{it} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon$$

Where,

$Y$, Solvency position of company *i in time t*

$\beta 0$, Regression equation constant

$X_{1it}$, Debt level for company *i in time t*

$X_{2it}$, Business activity level for company *i in time t*

$X_{3it}$, Board diversity for company *i in time t*

$X_{4i}$ , Level of competition for company *i in time t*

$\varepsilon$, Probable residual error

$\beta 1, \beta 2, \beta 3, \beta 4$, the coefficients for level of debt, activity level, board independence and

competition level respectively.

### 3.6.2 Test for Significance

Significance is a test to help in interpretation of the results in terms of rejection or fail in rejecting the hypothesis tested. In this study, a significance level of 5% was used to interpret the results. A 95% confidence level has been selected to increase the precision in interpretation.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1 Introduction

This chapter explores the nature of data collected and its use in answering the research questions. The chapter elaborates on data availability, the variables summary statistics like mean, standard deviation and ranges and also explores the different tests done on the data to confirm its fitness for use in meeting the research objectives. The chapter also explores the results of the study in light of the research objectives and discusses the implications of such findings.

## 4.2 Descriptive Statistics

Data for this study was readily available and the overall collection percentage was adequate in arriving at the study objectives. All needed solvency ratio data was available at 100% response rate and debt ratio and competition levels. On business activity, the response rate was at 93% while for board diversity, it was 80%. Overall, the lowest data was that of board diversity and considering the minimum response rate of 70% suggested by Mugenda and Mugenda (2013), the data response rate was excellent. Being excellent, the data was therefore adequate for analysis and drawing of conclusions.

**Table 4.1 Response Rate Table**

| Variable | Solvency ratio | Debt level | Business activity | Board diversity | Competition level |
|---|---|---|---|---|---|
| Data collected | 235 | 235 | 218 | 187 | 235 |
| Unavailable data | 0 | 0 | 17 | 48 | 0 |
| Total | 235 | 235 | 235 | 235 | 235 |
| Response rate (%) | 100% | 100% | 93% | 80% | 100% |

**Source: Author**

Summary statistics of the collected data show that at an average, the solvency ratio in the firms listed in NSE is 21.10. Investors willing to invest in listed companies should therefore expect at

an average their stock to have such solvency position. There are however, high variations in the solvency ratios as indicated by the high standard deviation of 53.18. This level of standard deviation shows that although the mean is 21.10, investors and other company stakeholders should expect huge variations and if their stocks have a very different solvency position, it should not catch them by surprise. Looking at the range, its wide as the minimum solvency position is -378.0 while the highest solvency position is 249.3.

On debt levels, the firms have a mean debt of 2.58e+07 with a standard deviation of 6.02e+07. The huge standard deviation shows that there is a great variation in the way listed firms use debt in financing their operations. Investors should therefore be aware of the expected debt level and thus consider if they would invest in such a market. There are some firms, which have not used debt within the study period while the highest debt used was 3.36e+08. Business activity, as measured by the amounts of revenue generated, has an average of 2.41e+07 and a standard deviation of 6.02e+07. The lowest level was zero suggesting no sales made while the highest was 2.33e+08.

Board diversity was measured using the proportion of non-executive directors in the board of directors. On average, the board contains 51.78% non-executive directors with a high variation as indicated by the standard deviation of 31.58. There were some firms without non-executive directors while the highest within the study period was 97%. Competition had low variation with a standard deviation of 3.82 and a mean of 6.55. This means that, for every company, there are 6.55 other firms competing directly with it. The highest competition level was 12 while the lowest was 0 meaning that there are some firms without competition in the NSE.

**Table 4.2 Table for Data Summary Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Solvency Ratio | 235 | 21.10121 | 53.18906 | -378.0019 | 249.3149 |
| Debt level | 235 | 2.58e+07 | 6.02e+07 | 0 | 3.36e+08 |
| Business activity | 218 | 2.41e+07 | 4.42e+07 | 0 | 2.33e+08 |
| Board diversity | 187 | 51.78079 | 31.58819 | 0 | 96.6667 |
| Level of competition | 235 | 6.553191 | 3.827524 | 0 | 12 |

**Source: Test results**

### 4.3 Diagnostic Tests

In ensuring that the data was fit for analysis, several tests were performed on the data to confirm its fitness for regression, which was the method of analysis used. The tests were aimed at taking corrective measures to prevent deficiencies in the data from affecting the study results and hence conclusions. Tests done were for multicollinearity, linearity, stationarity, missing variables, heteroscedasticity, normality, skewness and Haussmann test for model misspecification. The tests are outlined in this section together with their findings.

#### 4.3.1 Test for Omitted Variables

Omitted variables were tested using the Ramsey RESET test and interpretation done at 95% confidence interval. The null hypothesis used was that the model was not suffering from omitted variables. The test returned a significant p-value, which meant that the null hypothesis was rejected. The model was thus concluded to have omitted variables but did not cause an alarm as the focus was on the impact of debt financing but not generally, all factors, which can affect solvency.

**Table 4.3 Ramsey RESET Test Table**

| |
|---|
| Ramsey RESET test |
| Ho: model has no omitted variables |
| F(3, 173) = 20.07 |
| Prob > F = 0.0000 |

**Source: Ramsey RESET test results**

### 4.3.2: Linearity

Linearity was tested by plotting graphs of the independent variables against the dependent variables and noting the nature of the graphs. This was done to confirm fitness of the data in running the regression. The variables were found to have a linear negative relationship with that of business activity being the lowest.

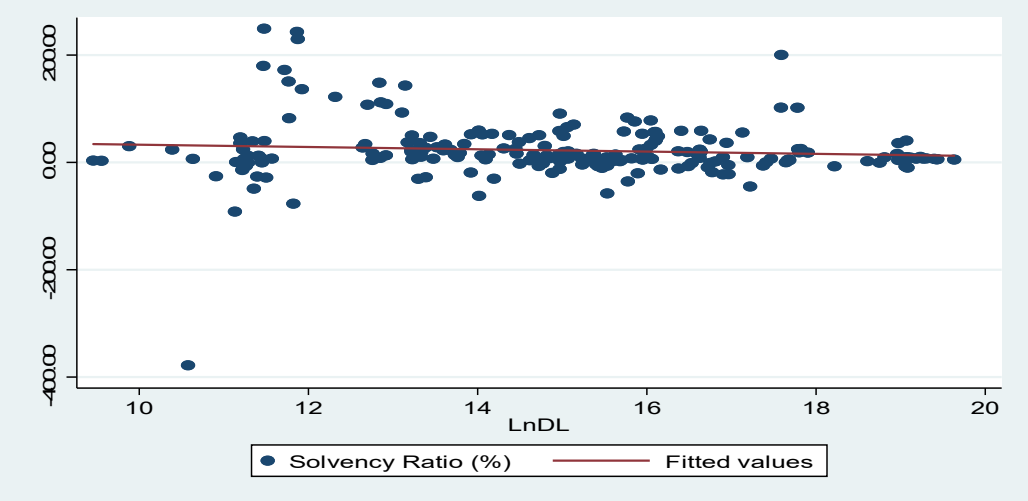



*Fig 4.1: Linear test results for debt level*

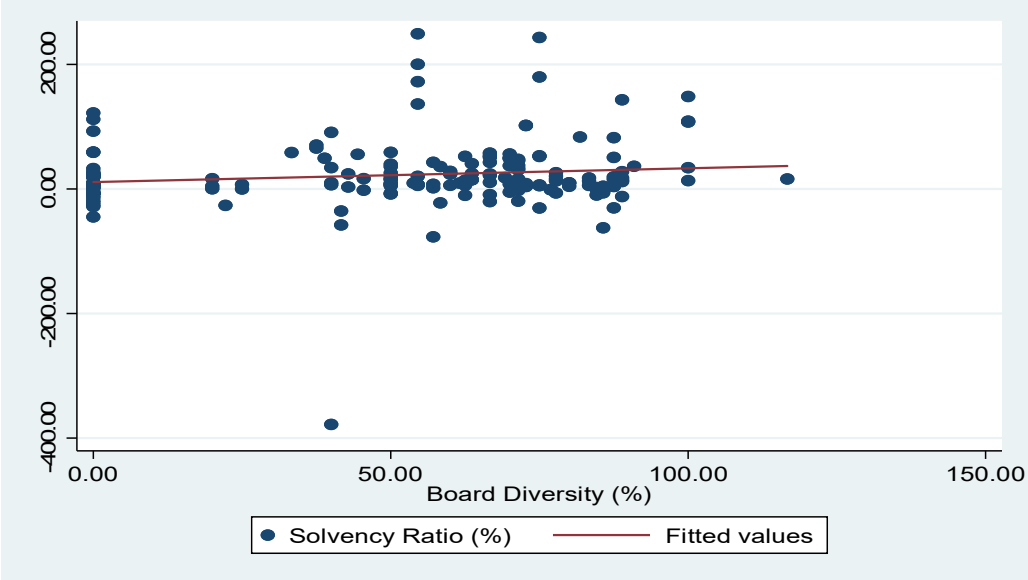



*Fig 4.2: Linear test results for board diversity*

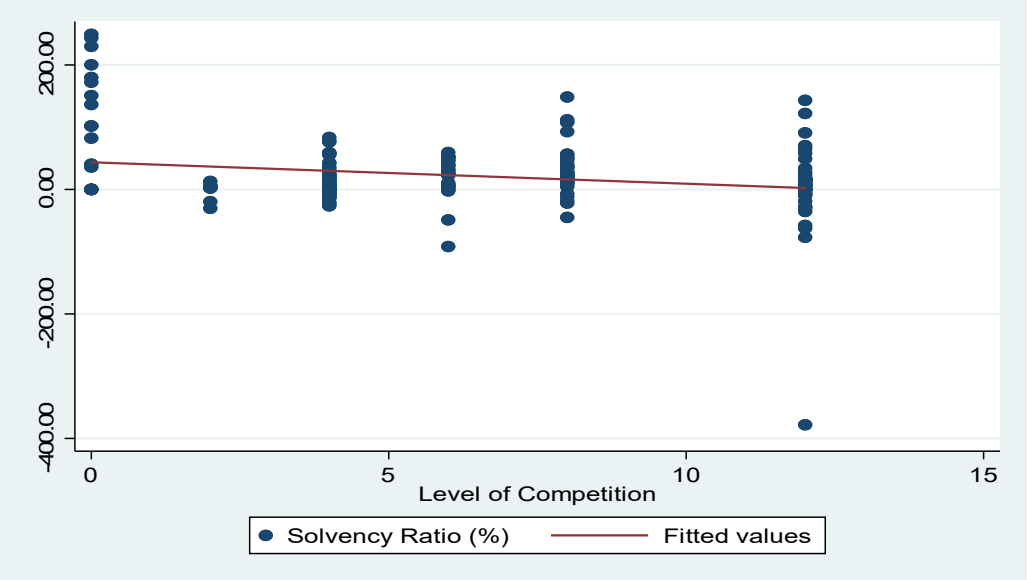



*Fig 4.3: Linear test results for level of competition*

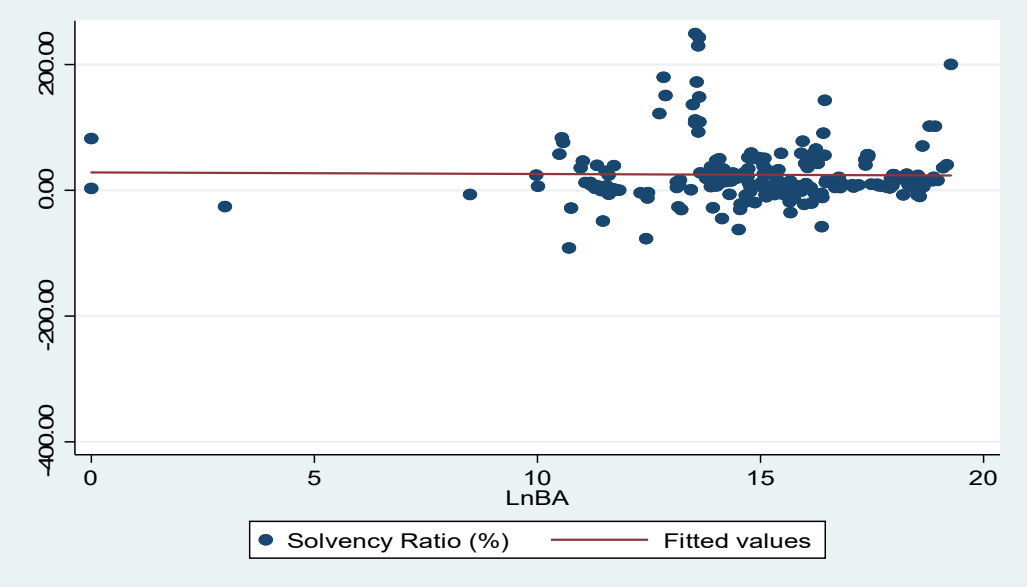



*Fig 4.4: Linear test results for business activity*

### 4.3.3 Test for Heteroscedasticity

Breusch-Pagan test was used to test for multicollinearity in the model. The test was based on the null hypothesis that the model was homoscedastic. The test returned a significant p-value which

meant that the null hypothesis be rejected and a conclusion that the model variables were suffering from heteroscedasticity. Differencing was done in regression to correct this anomaly.

**Table 4.4 Breusch-Pagan Test Results Table**

| Breusch-Pagan test |
|---|
| Ho: Constant variance |
| chi2(1) = 65.95 |
| Prob > chi2 = 0.0000 |

**Source: Breusch-Pagan test results**

### 4.3.4 Haussmann Test

The test was done to help in choosing between the fixed effects and the random effects models. Fixed effects model was first run followed by the random effects and then Haussmann test done. The null hypothesis tested was that the fixed effects model was efficient. The Haussman Test returned a significant p-value meaning that the random effects were efficient in the study

**Table 4.5 Fixed Effects Model Results**

| Fixed-effects (within) regression | | | | Number of obs = 181 | | |
|---|---|---|---|---|---|---|
| Group variable: Company | | | | Number of groups = 46 | | |
| R-sq: | | | | Obs per group: | | |
| within = 0.1916 | | | | min = 1 | | |
| between = 0.0753 | | | | avg = 3.9 | | |
| overall = 0.0866 | | | | max = 5 | | |
| | | | | F(3, 132) = 10.43 | | |
| corr(u_i, Xb) = -0.6487 | | | | Prob > F = 0.0000 | | |
| Solvency Ratio | Coef. | Std. Err. | T | P>\|t\| | [95% Conf. Interval] | |
| Board diversity | -.0221521 | .0807676 | -0.27 | 0.784 | -.1819184 | .1376142 |
| Level of competition | 0 (omitted) | | | | | |
| Ln debt level | -26.90023 | 5.56158 | -4.84 | 0.000 | -37.90159 | -15.89888 |
| Ln Business activity | 6.29519 | 1.99694 | 3.15 | 0.002 | 2.345045 | 10.24534 |
| _cons | 341.2528 | 86.88052 | 3.93 | 0.000 | 169.3946 | 513.1111 |
| sigma_u 55.520071 | | | | | | |
| sigma_e 24.313745 | | | | | | |
| rho .83908093 (fraction of variance due to u_i) | | | | | | |
| F test that all u_i=0: F(45, 132) = 10.10 Prob > F = 0.0000 | | | | | | |

**Source: Fixed effects regression results.**

**Table 4.6 Random Effects Results Table**

| Random-effects GLS regression | | | | Number of obs = 181 | | |
|---|---|---|---|---|---|---|
| Group variable: Company | | | | Number of groups = 46 | | |
| R-sq: | | | | Obs per group: | | |
| within = 0.1629 | | | | min = 1 | | |
| between = 0.2227 | | | | avg = 3.9 | | |
| overall = 0.2058 | | | | max = 5 | | |
| | | | | chi2(4) = 36.04 | | |
| corr(u_i, X) = 0 (assumed) | | | | Prob > chi2 = 0.0000 | | |
| Solvency ratio | Coef. | Std. Err. | Z | P>\|z\| | [95% Conf. Interval] | |
| Board diversity | .010615 | .0782407 | 0.14 | 0.892 | -.1427339 | .163964 |
| Level of competition | -4.780929 | 1.485227 | -3.22 | 0.001 | -7.69192 | -1.869939 |
| Ln debt level | -14.35669 | 2.674701 | -5.37 | 0.000 | -19.59901 | -9.11437 |
| Ln Business activity | 6.891766 | 1.655084 | 4.16 | 0.000 | 3.647861 | 10.13567 |
| _cons | 169.763 | 35.71589 | 4.75 | 0.000 | 99.76116 | 239.7649 |
| sigma_u 33.769435 | | | | | | |
| sigma_e 24.313745 | | | | | | |
| rho .65859259 (fraction of variance due to u_i) | | | | | | |

**Source: Random effects regression result**

**Table 4.7 Hausman Test Results Table**

| | Fixed effects | Random effects | Difference | S.E. |
|---|---|---|---|---|
| Board diversity | -.0221521 | .010615 | -.0327671 | .0200449 |
| Ln Debt level | -26.90023 | -14.35669 | -12.54354 | 4.876181 |
| Ln Business activity | 6.29519 | 6.891766 | -.5965755 | 1.117349 |
| Test: Ho: difference in coefficients not systematic | | | | |
| chi2(3) = 16.15 | | | | |
| Prob>chi2 = 0.0011 | | | | |

**Source: Haussmann test results**

### 4.3.5 Test for Multicollinearity

Multicollinearity in the variables was tested using the Variance Inflation Factor and interpreted using a 5% significance level. The variables were found to have a very low VIF with the highest being 2.26 for ln of business activity. The mean VIF was 1.65, which meant that the variables did not have a high multicollinearity amongst themselves. They were thus all included in the regression to determine their effects on solvency position of a company.

**Table 4.8 Multicollinearity Test Results**

| Variable | VIF | 1/VIF |
|---|---|---|
| Ln Business activity | 2.26 | 0.442316 |
| Ln Debt level | 2.24 | 0.446094 |
| Level of competition | 1.07 | 0.932614 |
| Board diversity | 1.02 | 0.981342 |
| Mean VIF | 1.65 | |

**Source: VIF test results**

### 4.3.6 Test for Stationarity

Augmented Dickey Fuller test was used to determine stationarity in the variables. The test was based on the hypothesis that the panels contain unit roots. The p-values returned were all significant meaning that the panels were not stationary. Differencing was used in the regression to make them stationary.

**Table 4.9 ADF Test Results**

| Variable | | Statistic | P-value | Number of panels | Average number of periods |
|---|---|---|---|---|---|
| Solvency ratio | Inverse Chi2 (94) P | 724.0236 | 0.0000 | 47 | 5 |
| | Inverse Normal Z | -10.6809 | 0.0000 | | |
| | Inverse Logit t(234) L* | -24.9404 | 0.0000 | | |
| | Modified Inverse chi2 Pm | 45.9492 | 0.0000 | | |
| Ln Debt level | Inverse Chi2 (90) P | 639.2128 | 0.0000 | 47 | 4.7 |
| | Inverse Normal Z | -9.7050 | 0.0000 | | |
| | Inverse Logit t(194) L* | -24.1286 | 0.0000 | | |
| | Modified Inverse chi2 Pm | 40.9359 | 0.0000 | | |
| Ln Business activity | Inverse Chi2 (86) P | 641.1163 | 0.0000 | 46 | 4.67 |
| | Inverse Normal Z | -11.3148 | 0.0000 | | |
| | Inverse Logit t(184) L* | -26.4284 | 0.0000 | | |
| | Modified Inverse chi2 Pm | 42.3272 | 0.0000 | | |

**Source: ADF test results**

### 4.3.7 Normality test

This test was done to understand the distribution of the data around the mean values of the

variables. The test was done by testing both the skewness and Kurtosis. Data for level of business activity was found to be well distributed while that of solvency ratio, board diversity, level of competition and debt level were found to be slightly skewed to the right. Since the skewness was not so huge, it was concluded that the data was not suffering from severe uneven distribution.

**Table 4.10 Normality Test Results Table**

| Variable | Obs | Pr(Skewness) | Pr(Kurtosis) | adj chi2(2) | Prob>chi2 |
|---|---|---|---|---|---|
| Solvency ratio | 235 | 0.0608 | 0.0000 | 54.69 | 0.0000 |
| Board diversity | 187 | 0.0020 | 0.0000 | 23.36 | 0.0000 |
| Level of competition | 235 | 0.3296 | 0.0000 | 41.49 | 0.0000 |
| Ln Debt level | 221 | 0.6409 | 0.0074 | 70.. | 0.0302 |
| Ln Business activity | 215 | 0.0000 | 0.0000 | 73.47 | 0.0000 |

**Source: Normality test results**

### 4.4 Correlation Analysis

Correlation coefficients between the variables of the study was tested using the Pearson Correlation Coefficient. Solvency ratio was found to be positively correlated with board diversity at with a coefficient of 0.1277 while it was negatively correlated with level of competition, level of debt and business activity level. The highest correlation was with level of competition at an absolute value of 0.2478. In all the variables, it is only level of debt which had a high correlation with level of business activity at 0.7288. This shows that as the business activity level increases, so does the amount of debt used by the company.

**Table 4.11 Correlation Analysis Results Table**

| | Solvency ratio | Board diversity | Level of competition | Ln Debt level | Ln Business activity |
|---|---|---|---|---|---|
| Solvency ratio | 1.0000 | | | | |
| Board diversity | 0.1277 | 1.0000 | | | |
| Level of competition | -0.2478 | -0.0798 | 1.0000 | | |
| Ln debt level | -0.0927 | 0.1363 | -0.0829 | 1.0000 | |
| Ln business activity | -0.0149 | 0.1071 | 0.1262 | 0.7288 | 1.0000 |

**Source: Pearson correlation coefficient test results**

### 4.5 Regression Analysis and Hypotheses Testing

Regression of the data indicated that the variables under study do affect the solvency level as initially thought. The four independent variables were found to account for 20.58% of the variations in the solvency levels of the listed companies. The results indicate that there are other factors, which account for the remaining 79.42%. The study results were also significant at a 5% significance level as indicated by the p-value.

**Table 4.12 ANOVA**

| | |
|---|---|
| Random-effects GLS regression | Number of obs = 181 |
| Group variable: Company | Number of groups = 46 |
| R-sq: | Obs per group: |
| within = 0.1629 | min = 1 |
| between = 0.2227 | avg = 3.9 |
| overall = 0.2058 | max = 5 |
| | chi2(4) = 36.04 |
| corr(u_i, X) = 0 (assumed) | Prob > chi2 = 0.0000 |

**Source: Panel regression results**

Results of the regression have also indicated that both the level of competition and level of debt affect solvency levels negatively while, board diversity and level of business activity affect solvency ratios positively at coefficients of 0.010615 and 6.891766 respectively. The effects of competition level, debt level and level of business activity are all significance with p-values of 0.001, 0.000 and 0.000 respectively. The effect for board diversity was insignificant at 5% significance level with a p-value of 0.892. The constant of the equation is 169.763. in absolute terms, the factors rank from the one with the highest impact is level of debt, level of business activity, level of competition and lastly the board diversity. A firm should therefore seek to boost their solvency position by diversifying its board, taking measures to counter the effects of competition, reducing its debt levels and taking steps to boost the company business activities to generate higher revenues.

**Table 4.13 Regression Analysis**

| Solvency ratio | Coef. | Std. Err. | z | P>\|z\| | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| Board diversity | .010615 | .0782407 | 0.14 | 0.892 | -.1427339 | .163964 |
| Level of competition | -4.780929 | 1.485227 | -3.22 | 0.001 | -7.69192 | -1.869939 |
| Ln debt level | -14.35669 | 2.674701 | -5.37 | 0.000 | -19.59901 | -9.11437 |
| Ln Business activity | 6.891766 | 1.655084 | 4.16 | 0.000 | 3.647861 | 10.13567 |
| _cons | 169.763 | 35.71589 | 4.75 | 0.000 | 99.76116 | 239.7649 |
| sigma_u 33.769435 | | | | | | |
| sigma_e 24.313745 | | | | | | |
| rho .65859259 (fraction of variance due to u_i) | | | | | | |

**Source: Panel regression results**

### 4.6 Discussion of Research Findings

Having established a very high impact of debt on solvency position of a company, the study agrees with the Debt Theory that regardless of its necessity in business operations, debt implications and magnitude should be closely monitored to enable a company to reap the benefits of debt. The study also agrees with Wray (2004) that debt effect on business is also affected by other variables, which cannot be separated from it. This is in consideration of the comparison between the results of the correlation analysis and the regression results where the coefficient of debt in the regression results have been seen to increase significantly.

The study also agrees with the Theory of Debt Overhang that debt may bring about repayment problems. This is because in the NSE listed firms, the debt has been seen to decrease the solvency position by 14 points for every unit increase in debt. This is a significant effect. Observations by Cordella, Ricci and Ruiz-Arranz (2010), that debt problems may be due to poor policy formulation, cannot be ignored and the reason behind the negative effect needs further evaluation.

The study findings confirm those of Baraja and Yosya (2019) that there is a positive effect on solvency position by business activity only that for NSE listed firms, it is significant. The findings by Palaniappan (2017) on board diversity and frequency of meetings cannot however be disputed

by this study as frequency of meetings of the board were not considered in the current study. There is nevertheless a positive impact noted in the current study which agrees with their findings save for the omission of the frequency of director meetings in the current study. This study agrees with the findings of Rehman and Shah (2013), solvency, which is part of business performance measures, is positively impacted by board independence.

On competition, the study agrees with the findings of Almarzoqi, Naceur and Scopelliti (2015) that there is a negative effect on solvency position by competition. This study, having been done on non-financial firms, complements that previous study which was based on financial institutions and so effect of competition cuts across all industries.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This section of the study concentrates on the summary of the major research findings based on the different tests that were conducted. It also develops some of the conclusions based on the research findings in line with the study objectives that guided the researcher. Recommendations were also developed based on the finding of the study. In conclusion, the chapter looks at some of the limitations that were encountered in the process of research and makes suggestions on the areas to be covered by future studies.

## 5.2 Summary of Findings

The main objective that made the researcher to conduct this study was to establish the effects of debt financing on the solvency position of non-financial firms listed in the NSE market. In the attempt to achieve the research objectives, the researcher considered some other variables to be relevant in support for reliable relationship between the variables. Among such variables included the level of business activities which in the current study was measured using the turnover level for the businesses. Board independence was also considered relevant as measured by the ratio of independent directors to total directors in the listed firms in NSE. Lastly, the level of competition as measured by the number of non-financial firms that were listed and that were operating in the same industry was also studied. The data relating to these variables was obtained from the capital market authority of Kenya where they are normally published.

In the NSE, there are a total of 47 listed firms in the security market and whose data was collected for five years giving rise to a total of 325 possible data points. In general, the worst response rate on the variables was established to be 187 data points in respect of the board independence variable

and which was noted to be 79% response rate and which was considered sufficient to form a basis of conclusion for the study results. From the summary of statistics results, the solvency position ratio was found to be having a mean score of 21.10, debt level and business activity as indicated by sale of the firms having a mean of 25 million and 24 million Ksh. respectively. Board diversity was established to be having a mean of 51.78% while level of competition was having a mean of 6.55 firms per industry. The multicollinearity results as indicated by the VIF were noted to be in the range of 1.02 and 2.26, which were clear indication that the set of data was free from multicollinearity. From the autocorrelation results, the study findings established that all the variables in the study affected the solvency level of a business in a negative way except for the board independency which was having a positive influence on the solvency.

From the regression results, the results on the effect of debt level on the solvency of non-financial firms listed in the security market indicate that debt level influenced the solvency levels for firms in a not only negative way but which was also significant at the 95% confidence level. The regression results on the board diversity indicated that board diversity influences the solvency position of a business in a positive way but which was statistically insignificant. The results indicated that the business activity as indicated by sales was positively affecting the solvency position and which was statistically significant. Lastly the level of competition in the industry was found to be having a negative significant influence on the solvency position of the firms that were listed in the NSE. The results on the random effects as favored by the Hausman test indicated that the R-sq value was 16.29%.

### 5.3 Conclusions

From the research findings, a number of conclusions can be derived in respect of the research objective. The negative significant relationship between the debt level and the solvency level leads

to the conclusion that the debt level was unhealthy to the solvency of a business. This is because as the business uses more of the debt financing, the risk associated with credit default also increases and in case of a slight misfortune to the business, the firm will easily get into insolvency problems. Board independence on the other hand was found to be having a positive influence on the solvency position. This leads to the conclusion that more independent boards had a good ability to analyze the level of debt to take and when to take it which ensured that the firm did not over rely on the debt when it was not necessary. Also the procedure that could be associated with taking credit in these firms was also complicated and which ends up reducing the credit appetite for the businesses. Based on the negative significant impact of the level of competition to the solvency position of the firms listed in the NSE, the researcher concludes that the firm's competition was not healthy for the business solvency position. This was due to the fact that the success of the firms was not guaranteed and the firms could easily be out done by its competitors if they were not smart. This in return led to a lot of cost being incurred to research on the market and which otherwise could have been used to develop the businesses operations. On the aspect of business activity which was established to have a positive influence on the solvency of firms in the NSE, the researcher can conclude that high sale were favorable to the business as they were the major source of revenue and which could cushion the risk of insolvency by providing extra returns that can be used to cover up both the debt and the interest there off and hence boosting the solvency position of the firms. In regard to the R-sq value of 16.29%, it is an indication that the variables under consideration explained only 16.29% of the causes of the insolvency in business and the research concludes that there may be many other factors that may be affecting the solvency position of firms and that have to been factored in the current study.

## 5.4 Recommendations

The researcher makes the following recommendations based on the research findings discussed above. The debt level has been found not to be healthy for the solvency of a business and the researcher recommends that firms should at all cost try to minimize the debt taken and utilize any debt in the most profitable way possible such the project taken through the debt can service its own debt and give extra returns to the business. A negative influence on the solvency based on the level of competition in the industry is a clear indication that firms in less competitive markets enjoy the power of monopoly and hence perform well. The researcher therefore recommends that a firm should mostly consider diversifying its operations to enter into some operations within the industry that creates a segregated monopoly within the market so as to boost their performance and hence the solvency position.

The positive relationship between the activity level of a business and the level of solvency of the firm, the researcher recommends that businesses should adopt the best strategy in the market they operate in so as to boost the returns to the business as this is favorable to the firm's solvency position. On the board independence that was having a positive influence to the solvency position of firms in the NSE market, the researcher recommends that the firms should try as much as possible to diversify their boards of directors, preferring independent directors that have different skills and professions that become a resource to the business. Also the policies relating to the firm's structure and debt appetite should be reviewed to ensure proper planning for credit before authorization and during the implementation of the projects.

## 5.5 Limitations of the Study

The study had some limitations. One of the biggest limitation was limitation of the research in Kenya which was necessitated by a need for a more focused research. This limitation means that

the results may only be used to advise business stakeholders in Kenya only or countries with similar conditions like Kenya. Another limitation was basing the research on only four independent variables. This limitation was necessary as there was a need to focus on specific factors to be able to derive concrete analysis on them.

The study is also limited to only 5 years. This limitation means that business environment for the times outside the five years have not been considered and therefore their effects may not be analyzed. However, the researcher considers research as an ongoing activity with other researches complementing others. Another limitation in the study was that it was limited to public listed firms only. This limitation may affect the study results applicability in the private sector. This necessitates further researches in the private sector to enable proper guidance and advise to private company stakeholders to be properly informed.

### 5.6 Suggestions for Further Research

Based on the identified limitations, there is need for further research to compliment the results of this study. It is recommended that similar study be done focusing on the private sector and also the financial firms to determine how the same factors affect such firms. In recognition of the role played by SMEs in an economy, the researcher recommends that further research be done focusing on SMEs to ensure that they are also informed on the effect of debt on their solvency position. Another research can also be done focusing on other factors but maintaining the dependent variable to understand fully what can influence the solvency position of a business.

Researches can also be done outside Kenya to compare with the results from local studies and help in identifying similarities in the effects or their differences. Differences can help in identifying the reasons behind the effects. Further evaluation of the reasons behind the negative or positive relationships can be evaluated using further researches to enable a deeper understanding and taking

of corrective measures.

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# APPENDICES

## Appendix I: NSE Listed Companies

1. Arm Cement Plc
2. Atlas African Industries Ltd Gems
3. BOC Kenya Plc
4. Bamburi Cement Ltd
5. BAT Kenya Plc
6. Car & General (K) Ltd
7. Carbacid Investments Ltd
8. Centum Investment Co Plc
9. Crown Paints Kenya
10. Deacons (East Africa)
11. EA Cables Ltd
12. EAPortland Cement Co. Ltd
13. Eaagads Ltd
14. East African Breweries
15. Eveready East Africa
16. Express Kenya
17. Flame Tree Group Holdings
18. Home Afrika Ltd
19. Kakuzi Plc
20. Kapchorua Tea Company. Ltd
21. Kengen Co. Plc

22. Kenolkobil Ltd

23. Kenya Airways

24. Kenya Orchards

25. Kenya Power and Lighting Company

26. Kurwitu Ventures Ltd

27. Longhorn Publishers

28. Mumias Sugar Co.

29. Nairobi Business Ventures

30. Nairobi Securities Exchange Plc

31. Nation Media Group Ltd

32. New Gold Etf

33. Olympia Capital Holdings Ltd

34. Safaricom Plc

35. Sameer Africa Plc

36. Sasini Plc

37. Standard Group Plc

38. StanlibFahari I-Reit

39. The Limuru Tea Co. Plc

40. Total Kenya Ltd

41. Tps EA Ltd

42. Trans-Century Plc

43. Uchumi Supermarket Plc

44. Umeme Ltd

45. Unga Group Limited

46. Williamson Tea Kenya Ltd

47. WppScangroup Plc

***Source: CMA (2020)***

**Appendix II: Data Collection Sheet**

| Company: …….. | | | | | | |
|---|---|---|---|---|---|---|
| | Sales Volume | Asset Base | No. of Directors | No. of Independent Directors | No. of firms in the Industry | Total Liabilities |
| 2015 | | | | | | |
| 2016 | | | | | | |
| 2017 | | | | | | |
| 2018 | | | | | | |
| 2019 | | | | | | |