

**FINANCIAL LEVERAGE AND FIRMS GROWTH: A PANEL DATA ANALYSIS  
OF NSE LISTED AGRICULTURAL FIRMS**

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**DECLARATION**

This project is my original work and has not been presented for a degree in any other University or any other award.

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This project has been submitted for examination with my approval as the University Supervisor.

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## **DEDICATION**

I dedicate this paper to Almighty God for strength, inspiration and enabling me finish well, secondly to my parents Thomas Makenzi and Dorcas Mwanziu for supporting me and encouraging me through this journey

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I take this opportunity to thank the All Mighty Father for granting me this opportunity and for the gift of life.

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## LIST OF ABBREVIATIONS

FL	Financial Leverage
CS	Capital structure
FAO	Food and Agriculture Organization
ROA	Return on Asset
ROE	Return on Equity
EPS	Earning per Share
GDP	Gross Domestic Product
CMA	Capital Market Authority
NSE	Nairobi Securities Exchange
MIMS	Main Investment Market Segment
PROF	Profitability
LEV	Leverage
FS	Firm Size
FISMS	Fixed Income Securities Market Segment
AIMS	Alternate Investment Market Segment

## **ABSTRACT**

The study sought to examine how financial leverage affects the growth of listed agricultural firms in Kenya using a panel regression model. Since every firm yearns to either grow externally or internally they make financial decisions on how to get capital to fund such growth through acquiring debt or equity. The study purpose is to contribute to the discussion about the effect of financial Leverage on growth of listed agricultural firms. This paper used annual secondary data available for all listed agricultural firms with NSE and specifically from their audited financial statements and reports, as well as from NSE handbook. Panel regression model was used for estimation in the study. Growth is measure in terms of asset growth where annual assets acquired are aggregated and the percentage changes determined to help track the growth of the firm. The study found leverage and profitability positively impacted firm's growth while the age of the firm was negatively associated with growth of the firm. The fact that age negatively impacted firm's growth was contradictory as it expected that as a firm grows in age, then is gains a lot in terms of market share, customers and general industry experience that my help it adapting in both good economic times and tough times.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

The retail value and stock prices of a firm determine capital structure and optimal capital mix of acquiring debt and issuing equity (Raza, 2013). This mix is known as leverage and determines the real investments of the firm (Myers, 2001). Leverage changes depending on factors such as the capital cost, market type, firm size, information available, manager's goals and perception (Bei, et. al., 2012).

For shareholders' wealth to be maximized a proper debt and equity mix must be ensured by business managers (Maina & Kondongo, 2013). The managers must plan how the business will finance its operations and growth prospects through good investments. In ensuring any debt and preferred equity increases the firms' value and shareholders bottom-line earnings, a firms' optimal capital structure should be kept in mind when making financing decisions. In making financial investment firms may use retained earnings, debt or equity. Retained earing will suffice when a firm is doing well. In the event that a firm has no capital, then it must seek financial leverage. Olang', (2015) asserts that to finance investments using borrowed funds is financial leverage thus it aims at reducing capital cost to improve on the profitability of firms.

Degree of a firm's borrowing and preferred equity usage in financing or asset acquisition is financial leverage. A firm that uses financial leverage is said to be trading on equity. Equity is the value of share issued by a firm and the amount money borrowed by one party from another is debt. High financial leverage is a result of high employment of debt by a firm. A firm's bottom line earnings per share will be affected negatively if a firm acquired financial leverage of high degree which attracts high interest payments. High level of financial leverage also threatens the returns shareholders expect from their investments due to bankruptcy risk. It is affected by various determinants such as firm's size, age, and liquidity, tangible asset, shield on non-debt tax and growth opportunity among others.

A firm's ability to meet both short term requirements and the proper management of flow which can be promised by a profitable and good performing business is guaranteed by the optimum level of financial leverage (ALghusin, 2015). The capital structure optimal level entails proper merging of a firm's borrowing and equity used in carrying out its running operations. Firm's market value is defined by this mix. Optimal capital structure is the capital structure that maximizes firms' outstanding equities market value is the optimal capital structure (Weston and Brigham, 1952).

Growth of a business entity and its profitability is affected by financial leverage making it an area of interest. For the objective and this studies purpose to be achieved, financial leverage will be considered on how it effect firm's growth of NSE listed agricultural firms for the study period.

## **1.2 Firm's Growth and Leverage**

Leverage measures the degree with which debt finances business operations and asset acquisition (Enekwe et. al., 2014). Chadha and Sharma (2015), state that debt to equity ratio, alluding to the link between acquired capital and owners' equity is financial leverage . Firms that use debts are regarded as highly levered.

Use of leverage to finance business operations has both costs and benefits. The benefit of using debts to finance investment and growth is that firms do not pay taxes on interest accrued borrowed funds (Miller & Modigliani, 1963). When a firm uses too much debt, this can indicate a positive gesture to investors on its ability to meet its financial obligation hence financial stability. Use of debt also instills discipline in managers because they know that they have interest to pay on the loans. However, too much use of debt comes with high agency and bankruptcy costs. The firm's inability to meet its financial commitment raises a risk of it being liquidated to pay off the debts. This calls for better management of borrowed funds.

When a firm borrows funds to expand its portfolios, then such leverage grows the firm's assets and investments. Injection of extra capital raised through debt and equity can also see a firm grow its capacity to carry out business through enhanced technology and employment of quality labor. In return, this grows the output of a firm in terms of sales. This gradually grows its firm size and asset. The growth increases capacity of a firm to seek more leverage due to strong collateral base.

Studies by (Honjo and Harada, 2006; Hermelo and vassolo, 2007, Huynh and Petrunia, 2010) indicated that firm growth and leverage had a positive relationship. This means that as the firm borrows more, it realizes growth in sales and assets. However, (Lang et. al., 1996) found that leverage and growth of a firm had a relationship which was statistically negative. Therefore, it is the interest of this paper to probe the financial leverage effect on firm's growth of listed agricultural firm in Kenya for the study period.

### **1.3 The Agricultural Sector in kenya**

Agriculture is the cornerstone of Kenyan economy and it accounts as the major income source for majority of Kenyan population. According to FAO (2019) about 75% of Kenyans derive all or part of their livelihoods from the sector. Food security is one of the main agenda of the government and agricultural sector is one of the sectors which was fully devolved to achieve this agenda. This sector contributes more than 26% to the country's (GDP) directly and 27% indirectly via linkages to other sectors. More than 40% of Kenyan population is employed through this sector where more than 70% is in the rural areas

Agricultural sector accounts for more than 65% of the Kenyan export earnings and also providing livelihood for more than 80% by improving nutrition via production of diverse, safe, and nutritious foods. This sector also contributes to the other sector including by provision of raw material and ready markets for industrial products thus improving the purchasing power of the people

The role of agricultural sector contribution to economic growth depends on creating a favourable financial environment for the agricultural community. To a large extent the growth of this sector depends on access to finance which can be obtained from a variety of sources like debt and equity. Agricultural listed firms at NSE have a way to raise capital by selling of equity or acquisition debt. This sector is very volatile due to climate changes thus firms operate in the equity financing which have become expensive, forcing them to seek debt to finance their investment project

#### **1.4 The Nairobi Securities Exchange**

NSE began as an association of stockbrokers and shaped the development of securities market in Kenya through regulating trading activities. NSE is registered under the Societies Act (1954). The Capital Markets Authority of Kenya (CMA) was established in 1990 and oversaw the operations of the NSE. Within the East and central Africa, NSE is the largest bourse that provides the biggest market for equity and securities. NSE market is organized into three main segments; the MIMS, FISMS and AIMS. MIMS is the central market where quotations are made. Firms seeking short term sources of capital trade in MIMS while trading involving treasury and corporate bonds, preference shares and debenture stocks take place at FISMS. Therefore, NSE has a mandate to encourage savings and investments as well as providing easy access to capital for both local and international investors and borrowers together. In 2014, NSE was listed at the NSE Ltd.

There are sixty four firms and they are divided into thirteen division i.e. Agricultural, Banking, Construction and Allied, Commercial and services, Automobile & Accessories, Energy and petroleum, Investment, Insurance, real estate and investment, Investment services, Manufacturing and Allied, Telecommunication and Technology, and exchange traded fund. There are seven agricultural firms in the NSE.

The seven listed agricultural entities are; Kakuzi Limited, Limuru Tea Company Limited, Kapchorua Tea Company Limited, Rea Vipingo, Eaagads Limited, Sasini Limited and Williamson Tea Kenya Limited. Eagaads Company limited is located in Kiambu County. Its key activities are coffee growing and pulping before delivering it to coffee mills.

Kapchorua Tea Company limited is a branch of Williamson Tea Farms and was listed in 1972. Moreover, for more than six decades it has engaged in tea growing. Kakuzi Ltd was listed in 1951 and it's both at the NSE and London stock exchange. It focuses on cultivation, manufacturing and tea marketing, avocados, pineapples, macadamia production and also marketing, rearing of livestock, and development of forestry (NSE, 2017). Eaagads ltd was listed in 1972.

Limuru Tea Company limited engages in growing of green tea. Rea Vipingo Plantations ltd is the largest producer of sisal in Africa having its headquarters in Nairobi. Sasini Ltd produces tea and coffee both in retail and bulk. Moreover, it has yoghurt and pasteurized milk. Williamson owns the Kapchorua, Kaimosi, Tinderet and Changoi tea farms. It provides tea based products like lifeboat teas, gifts, elephant caddies, Mini cru, loose teas and tea bags (NSE, 2017). Limuru tea was listed in 1967, Sasini ltd 1965 while Williamson ltd was listed in 1972. If well managed, NSE provides a good market for firms seeking to expand their resources through lending and also seeking financial leverage.

### **1.5 Statement of the Problem**

Every firm yearns for growth. In order to do so, a firm needs to make financial decisions on how to get capital to fund such growth. A firm will make a decision to use retained earnings, equity or debt. A firm is known as levered when it decides to acquire debt and equity. Financial leverage use as a business capital source greatly boosts a firm's quest to grow and in the long term determines the firm's value. According to irrelevance proposition of Miller and Modigliani (1958), what determined firms' value was quality of investments held by a firm. For this, when seeking leverage, each and every firm must invest wisely in order to meet the equity and debt costs at the same time, maximizing its value and wealth.

In seeking financial leverage, managers must decide the optimal levels of leverage they want to employ in their capital structure. This entails looking at various determinant of capital structure like assets value, shields on non-debt tax, firms' growth opportunities, industry characteristics, earning volatilities, firm's size, and firm profitability (Bei et. al.,

2012). Among these determinants, growth is a key determinant of both financial leverage and capital structure (Titman & Wessel, 1988).

Growth of a firm refers to the percentage increase in the total annual assets, annual sales and operating profits (Hampton, 1993). A firm can have either external growth or internal growth. In order to grow in both dimensions, firms need to have financial strength (Pandey, 1994). In Kenya, firms seek leverage through borrowing from banks and the capital market, selling shares, and ploughing back profits in order to enhance their capital structure through increasing assets and reducing liabilities. Agricultural firms are among those firms seeking leverage.

The need for Kenya to be food secure has prompted many firms and business to invest in agriculture and finance is one of the significant challenges facing this sector with less than 10 percent of the bank's portfolios going to agriculture in Kenya, hence no credit for expansion. To invest, this firms will need money thus most firms borrow. But to what extent does borrowing affect their growth?

Numerous studies around leverage and growth of agricultural firms have focused on effects of financial leverage on profitability (Adongo, 2010; Mule & Mukras, 2015; Chesang' & Ayuma, 2016; Aziidah, 2017) and performance (Simonovska & Campos, 2012; Ibrahim, 2017). Others have focused on capital structure determinants in agricultural firms (Nurmet, 2011). To the best my knowledge, no paper in Kenya has been done out focusing on effects of leverage on growth of agricultural firms and this is study gap which this paper aims to bridge.

## **1.6 Study Questions**

The study will seek to give answers to the highlighted questions below:

- i. How does leverage affects growth of listed agricultural firms in Kenya?
- ii. Are there patterns on the use of financial leverage by Kenyan agricultural firms?
- iii. What policy conclusions can be drawn on growth and use of leverage relationship by agricultural firms?



## **1.7 Study Objectives**

It will be the overall objective for this study is to establish the financial leverage effects on growth of Kenyan listed agricultural firms at the NSE through a time series analysis for the period 2000-2017.

Specifically, the study will seek to;

- i. Examine the extensive patterns on financial leverage use by agricultural firms in Kenya
- ii. Provide evidence on how leverage affects growth of listed Kenyan agricultural firms
- iii. Determine the policy implications of too much leverage in determining the growth of Kenyan agricultural firms.

## **1.8 Justification of the Study**

This study recognizes that financial leverage is key bridging financial gaps. First, it's timely to express a view on the role of optimal capital mix of debt and equity on firms growth. Secondly, financial managers of these listed firms will find the findings useful in analyzing the interrelationship between financial leverage and growth to make financial strategies that will ensure growth of firm and also earning per share. Thirdly give an understanding to financial leverage effects on listed agricultural firms that will help investors to make informed decision on maximization of their wealth.

The findings will add knowledge to the existing body as far as effects of leverage and agricultural financing are concerned. Other stakeholders who will find the findings useful include the Kenyan government and Capital Markets Authority while and will use the results in formulating regulations and policies for publicly listed companies.

## **1.9 The Study Scope**

The study intends to use annual secondary data available for all agricultural firms (2010-2017) with NSE and specifically from their audited financial statements and reports, as well as from NSE handbooks and online materials. The study intends to have time series

and panels of the 7 listed firms under the agricultural sector as at today but may drop some depending on the availability of data. Use of panel and time series data shall help the study capture variations across time and the firms. This shall use panel regression as a method of estimation as shall be guided by the research objectives. Stata 14 series shall be the key statistical analysis tool for this study.

### **1.10 Organization of the Study**

Chapter two will provide comprehensive literature reviews while chapter three will discuss the research methodology employed with a key focus on the empirical model that the study will adopt. Chapter four will present the empirical model's results while chapter five will give a conclusion about the study findings and policy implications of the study.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

Theoretical literature and empirical literature on financial leverage effect on growth of listed agricultural firms at NSE from 2010-2017 are reviewed in this chapter. The overview of literature will help solidify on the niches of study concludes the chapter.

### **2.2 Theoretical Literature Review**

The leverage impact on firm's capital structure is explained by theories about capital structure. Traditional theorists on capital structure considered capital structure as key in determining firm's value. The capital structure depended on net and operating incomes that a firm and the capital cost declined with increase in the debt equity ratios (Durand, 1952). The seminal work of Miller and Modigliani (1958) laid a strong foundation for capital structure debates. They argued about the capital structure irrelevance in determining firm's value. To them, the quality of investments undertaken by a firm was the true measure of value of a firm. Durand (1959) criticized their proposition on grounds that markets are not perfect and riskless as they had posited. Miller and Modigliani (1963) corrected their initial irrelevance proposition and included taxes levied on interest accrued on leverage. This meant that when a firm used more leverage in their capital structure, they would get more tax shield on debt. This move came with unforeseen costs like bankruptcy and exorbitant interests on loans (Baxter, 1967). This only meant that firms would work towards looking for debt that would help a firm maximize tax benefits and minimizing the risks associated with bankruptcy costs (Abor, 2005).

Agency cost theory developed by Jensen and Meckling (1976) argues in seeking leverage, firms must consider agency costs. Shareholder's and firm manager's interests conflict attracting costs. Firm managers make decisions that do not maximize the benefits of the shareholders. As such, shareholders are at time forced to invest in expensive monitoring mechanisms so that managers are kept on their toes to can take positive NPV projects and ones that would have maximum returns of their investments (Mehran, 1992; Hashemi & Shivaraj, 2014). In fact, Donaldson and Stone (1984) noted that managers at times focused on increasing their individual well-being at the expense of growing shareholders' investments. In the long-run, firm managers may reinvest their incomes in form of shares

and in the long-run be part of the shareholders. This induces the agency problem. Managers no longer have the motivation to scale up the growth of the firm and as such, a conflict between the two parties is bound to happen.

According to Ross (1977), use of leverage by a firm can be used as key signal on the well-being of a firm. High portion of borrowing in firms' capital structure is deemed as a sign of strength in their financial management and discipline and hence many lenders are willing to lend them more. Furthermore, this can be a positive signal to investors as such firms deem great in honoring payments of dividends. Therefore, use of equity is a negative signal that firm managers are not optimistic about the firms' future.

Trade off theory of Myers (1984) was developed on the premise that firms have cost benefits comparison of using leverage in their capital structure. Firms' gain of using debt was shield of tax on interest accrued on debt while the costs were the probability of being declared bankrupt as well as the agency costs involved (Sogorb & Lopez, 2003). Therefore, there was need for firms to find a balance between the costs of borrowing as well as the benefits of using debt (De Angelo & Masulis, 1980). This theory posits that a firm has a target optimal capital structure which it works towards. Partial adjustment models are used to estimate target optimal capital structure and observed over a period. However, achieving the target capita can be hampered by market failures and information asymmetries (Fischer, et. al., 1989).

The trade of theory was disapproved by pecking order theory. Instead, the pecking order theory stated that in seeking financial leverage, firms follow certain hierarchy in operation financing (Myers & Majluf, 1984; Shyam-Sunder & Myers, 1999). First, firms will opt for using retained earnings because there is no information asymmetry and have no obligation. If not adequate, then firms can use leverage because the issue of debt signals board confidence in the profitability on the investment and the last option being the equity use as a result of high level of asymmetric information between the investors and firm managers. Investors think the value of the firm is overvalued to take advantage of them. Their theory focused more on using leverage that has least difficulties and asymmetric information because the degree of information asymmetry affects the cost of financing. That is, retained

earnings have little obligations while equity is prone to information asymmetry problems. These problems would make leverage expensive and firms preferred cost-friendly leverage.

A later observation by Baker and Wurgler (2002) showed firms look out for perfect time to issue shares. They called their theory, Market Timing Theory. It asserts that firm managers are rational when seeking leverage through shares (Myers & Majluf, 1984) and they issue stocks when share values are low and bought back when they are overvalued. This only means that share prices determine capital structure and by extension, leverage.

### **2.2.1 Determinants of Financial Leverage**

Financial leverage determines not only the performance and financial gain of a firm but also the growth of a firm. Having an understanding of the factors determining financial leverage helps managers profile their capital structure better and even manage to overcome business competitors. The size of debt relative to equity is referred to as financial leverage. Leverage includes combined, operating and financial leverage. Combined leverage constitutes financial leverage and operating leverage and alludes to firms' sales and earnings per share. Operating leverage includes asset procurement. Therefore a firm that has debt in its statement of financial position is said to be leveraged.

According to Kumar (2008), the key determinants of financial leverage are firm profitability, firm size, and real assets. Due to low fixed costs implying leverage and size are negatively related thus listed firms have a superior access to equity markets. However, firm size and debt with large firms are positively related because large firms have low agency costs, low strained cash flows, easy credit access and to benefit from the interest tax shields need more debt (Deesomsak et al., 2004). Byoun, (2008) asserts accumulation of large debts by firms helps them spread issuing costs but, Rajan and Zingales (1995) aver there could be either a positive or negative correlation. A relationship which is positive is depicted by diversification importance while a negative relationship will portray the role of asymmetric information

The asset structure determines the liquidity value of the firm. This is the reason why banks will be more inclined to lending funds to firms with real assets as this provides collateral for their money (Fraser, 2006). More tangible assets mean a lower degree of financial default and hence higher probability of getting financial leverage. However, profitable

firms find interest tax shields important since they are quite immune to costs of financial hardship (Frank & Goyal, 2009). Deesomsak et. al., (2004) found profitability and leverage have a negative correlation This paper aims to empirically test how company size, profitability, and asset tangibility affect firms growth.

### **2.3 Empirical Literature Review**

Odaló et. al., (2016) study investigated sales growth effects on financial performance of NSE listed Kenyan agricultural firms from 2003 to 2013. it was anchored on the theory of firm's growth. Using a descriptive and casual approach, annual sales of each of the firm was used as a measure of growth while EPS, ROE and ROA were used as financial performance parameters. They ran a pooled OLS. The study found sales growth and ROA are significantly positively related. The finding was in agreement with Babajide (2012) in Nigeria who concluded that access to credit through microfinance was not the only determinant of growth of firms. Other factors like the status of the economy, firm's size, and business location were also positively related to performance and growth of the firms. Odaló et. al., (2016) also found sales growth and ROE have a quite significant positive relationship and negative with earning per share. This study had a shortcoming which was that it only focused on one variable that affects financial performance and growth of the agricultural firm-sales growth.

In another study, Kinyua and Muriu (2017) investigated the capital structure determinants for agro-based Kenyan firms using annual panel data for 2010-2015 period. Using a panel regression model, the study ran long-term and short-term debt model to represent capital structure and used ROE, firm age, firm size and liquidity as the explanatory variables. The study found ROE and long-term debt have a negative relationship while firm age and the long-term leverage have a positive relationship. The study only focused on few capital structure determinants control variables.

In yet another study, Odaló et. al., (2016) evaluated the firm size effects on financial performance of listed Kenyan financial firms for the period 2003 and 2013. They applied economies of scale theory to relate benefits emanating from the proper management of costs and production volumes. The secondary data obtained was ran thorough a pooled OLS. Firm size was determined through taking logs of total assets, while ROE, ROA and

EPS were financial leverage measure. The study found that the size of agricultural firms affected positively the performance of a firm. Also size was found significant and positively related with ROE, ROA, and EPS and hence, large agricultural companies had a competitive edge over small firms even in securing leverage. This supported what Damanpouret. al. (2009) who found that firm size was influential in determining the performance and innovation of a business enterprise. The finding were in agreement with Vijayakumar and Tamizhselvan (2010), and Omondi and Muturi (2013) who observed there was a positive effect on firm profitability from firm size.

In the coastal region of Kenya, Mwamuye et. al., (2012), investigated determinants of agricultural firm's performance. It focused on the agricultural boards' characteristics and the financial targeting performance as two critical variables. The study found that number of meetings; board size and firms' performance were negatively related. Also, firms' sales growth and expansion were negatively related with financial performance targeting. The study also observed that educational levels were significant in determining the quality of the boards and this spilled over to the performance and growth of agricultural firms in the coastal of Kenya.

Waswa et. al. (2014) sought to investigate dividend payouts by Kenyan agricultural firms. They conducted an empirical analysis on seven NSE listed agricultural firms. Using a panel regression and correlation analyses, the proxies of dividend payout was the payout ratio (PR). The Study controlled for firm size, liquidity, growth opportunities, profitability and leverage. The study found that dividend payout and leverage has a negative relationship. This was consistent with studies by Jensen (1996) and Bradley et al., (1998) and contrary with the findings of Vasiliou and Eriotis (2003) and Pandey (2008).

In Estonia, Nurmet (2011) investigated the financial structure of agricultural firms for the period 1996-2008. The study investigates the higher leverage levels effects on the Estonian agricultural firms profitability. Using a financial ratio trend analysis, the findings indicated that increased debt levels affected debt to equity ratios leading to income volatilities and this meant that agricultural firms had to be cautious in their bid to attract more leverage for growth purposes.

In Sri Lanka, Bei et. al. (2012), examined financial leverage, firm growth and financial strength, of listed firms for 2000-2009 period. It aimed at investigating the positive or negative of financial leverage on firm's growth. Using a Multiple discriminant function, it investigated the total assets, profits and sales effect on financial strength. Through a multiple linear regression model, they found financial leverage; financial strength and growth this firms are positively related. In a similar study, Anton (2016) found that the growth of firms listed in Romania Stock Exchange (RSE) had a positive relationship with leverage and profitability while firm size was found to limit growth of firms.

Additionally, Njagi (2013), investigated NSE listed agricultural firms capital and financial performance relationship for the period 2008-2013. Using a panel regression analysis, he found a positive relationship between performance of agricultural performance and short-term and long-term debts.

Owuor (2013), investigated effects of size, earnings and leverage on listed agricultural at the NSE for the period 2008-2012. Applying regression and correlation analyses, found that firm size and leverage to be positively related and a negative relationship in use of leverage and earnings.

## **2.4 Overview of Literature**

The reviewed literature indicates financial leverage is key in growth and performance of firms in any sector. Financial leverage entails use of debt and equity in firms' operations financing. From empirical review, use of leverage enhances financial performance (El-Sayed, 2009; Javed Akhtar, 2012; Njagi, 2013; Omondi&Muturi, 2013; Maina&Ishmail, 2014; Aziidah, 2017) and promotes the profitability of a firm (Kodongo et. al., 2015). Use of borrowed funds comes with financial obligations to be met. This means that seeking leverage by a firm should be well thought.

The literature shows that most of the studies done in Kenya has been more on capital structure determinants and firms financial performance across the various sectors listed with NSE. Much focus has been on the monetary and non-monetary markets with less attention on growth of Kenyan agricultural firms. Studies that have focused on agriculture looked at the agricultural performance and profitability paying little or no attention on the growth of agricultural firms as result of using leverage. No study has been conducted in



Kenya looking specifically at leverage effect on growth of agricultural firms in Kenya to the best my knowledge. Moreover, this study aims at incorporating financial leverage determinants to include firm's size, firm's profitability and asset tangibility. These are the research gaps that this study aims to fill.

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.0 Introduction

The chapter outlines the adopted study research methodology. The chapter begins by describing the theoretical framework, followed by the empirical model. Definition and variable measurement follows in subsequent sub-section followed by econometric approach and sources of data. Estimation techniques conclude the chapter.

### 3.1 Theoretical Framework

Theoretical literature reviewed the various theories that explain capital structure. Existence of optimal capital structure is explained by capital structure theories. However, there has not been a theory that has singlehandedly managed to give an optimum capital mix that maximizes the firms' value. Moreover, the literature showed that the existence of financial deficits forces firms to borrow from banks or issue shares to meet their financing needs. Financial leverage is constituted by use of debt and equity. We can thus hypothesize that leverage is a function of debt and equity as shown in equation 1 below.

$$LEV_{ry} = f(EQ_{ry}, D_{ry}) \dots \dots \dots (1)$$

Where  $LEV_{ry}$  is the leverage applied by firm r and year y.  $EQ_{ry}$  is amount of equity issued by firm r and year y and  $D_{ry}$  is the amount of debt borrowed from banks by firm r and year y..

### 3.2 Econometric Model

To be able probe the financial leverage effects on growth of agricultural firm in Kenya, the empirical model of the study will be specified as follows:

$$GROWTH_{ry} = \beta_0 + \beta_1 LEV_{ry} + \epsilon_{ry} \dots \dots \dots (2)$$

Where  $GROWTH_{ry}$  represents the growth of firm r and year y and  $LEV_{ry}$  the leverage is applied by firm r in year y.  $\beta_s$  are the parameters for estimation.  $\epsilon_{ry}$  is the idiosyncratic model error term. The definition of each of the variables is in section 3.3 below.

Moreover, according to Kumar (2008), the main determinants of leverage in capital structure of firms are FS, PROFT and AT thus can rewrite equation (1) and equation (2) as follows.

$$LEV_{ry} = \alpha_0 + \alpha_1 FS_{ry} + \alpha_2 PROF_{ry} + \alpha_3 AT_{ry} + \varepsilon_{ry} \dots \dots \dots (3)$$

$$GROWTH_{ry} = \beta_0 + \beta_1 \{ \alpha_0 + \alpha_1 FS_{ry} + \alpha_2 PROF_{ry} + \alpha_3 AT_{ry} \} + \varepsilon_{ry} \dots \dots \dots (4)$$

Where  $FS_{ry}$  the size of firm r in year y is,  $PROF_{ry}$  is profitability of firm r and year y, and  $AT_{ry}$  is the asset tangibility of firm r and year y The  $\alpha_s$  represent the model parameters to be estimated. Description and measurement of these variables will follow the next section. The model of the study is represented by equation (4). Notice that it contains the error term that accounts for all other factors that could account for the leverage effects on the growth of Kenyan agricultural firms for the study period. Since some of the effects are unobserved and random, the  $\varepsilon_{ry}$  can then be rewritten as  $\varepsilon_{ry} = v_{ry} + u_{ry}$ . This means that the study's specified empirical model can be written as follow shown below.

$$GROWTH_{ry} = \beta_0 + \beta_1 \{ \alpha_0 + \alpha_1 FS_{ry} + \alpha_2 PROF_{ry} + \alpha_3 AT_{ry} \} + v_{ry} + u_{ry} \dots \dots \dots (5)$$

### 3.3 Definition and Variable Measurement

Growth of a firm will be the dependent variable. Following the corporate finance and investment guidelines, the firms' growth ( $GROWTH_{ry}$ ) is measured by growth of the profits, number of employees or asset growth. For this study, the proxy of growth will be asset growth where annual assets acquired will be aggregated and the percentage changes determined to help track the growth of the firm. As maintained by pecking order theory, growth and leverage are positively related and as firms grow they look for higher leverage to finance their operations (Booth et al., 2001; Chen, 2004). However, growth and leverage have a negative relationship as claimed by trade-off theory (Frank & Goyal, 2007; Frank & Goyal, 2009).

Leverage ( $LEV_{ry}$ ) refers to total liabilities and total assets ratio. Degree of seeking leverage by a firm is influenced by many other factors including firm size, profitability, asset tangibility and the nature of business. A firm that utilizes high degree of leverage may send a positive sign to investors that it is able to meet its financial obligations and this attracts investments through equity. However, leverage may attract costs in terms of high interests;

agency costs as well as the risk of bankruptcy in the event that liquidity is low and firm faces liquidation to generate funds. Then it means that use of leverage must be an optimal decision that a firm should make in structuring its capital.

Firm size ( $FS_{ry}$ ) refers to total growth in assets or net sales. As firms grow, they become more diversified and attain financial stability. They are then able to meet their borrowing obligations and paying their debts in time (Titman & Wessels, 1988). Leverage is positively related to firm size and logarithm of sales is used as a measure.

The static trade-off theory asserts that the high the profitability ( $PROF_{ry}$ ) of a firm, the more leverage such a firm will use in the capital structure but the pecking order theory believes that a profitable firm uses more of the retained earnings from profits rather than using debt (Bentancor, 1999; Guimaraes & de Castro, 2003). Profitability will be measured by taking operating incomes and total assets ratio.

The nature and kind of assets are the determinants of a firm's capital structure and this defines asset tangibility ( $AT_{ry}$ ). Assets are used as collateral for firms to secure leverage. In this study, asset tangibility will be measured by taking NBV of investments to tangible assets ratio.

### **3.4 Analysis Approach**

The study will employ panel regression model to examine financial leverage effect on growth of listed Kenyan agricultural firms at the NSE for the period 2010-2017. Panel data will be preferred in this study because it has the power to incorporate both the cross-sectional and time series characteristics that may have variations across the periods (Kinyua & Muriu, 2017). This helps check the biases through controlling for omission of variables.

In the estimating the model, the study will use Pooled OLS based on the idea that there are no correlations among firms in the sample as they are from the same sector. Also will use

the fixed effect model which allows variations of the intercepts of each firm while at the same time maintaining constant slopes. The random effect model assumes no correlation between firm specific traits with explanatory variables (Akinlo, 2011).

Using Breusch–Pagan test and the Eicker-White will be able to test for heteroscedasticity. Other tests to ensure absence of autocorrelation, serial correlation, will be administered.

### **3.5 Source of Data**

Secondary data from included annual financial statements, annual financial and cash flow reports for all agricultural firms listed and trading with NSE for the period between 2010 and 2017 will be used the study. The data will then be consolidated and based on the model variables.

Firms in the final sample:

- i. Must have traded consistently at the NSE for the period 2010-2017
- ii. Must have all financial and annual reports necessary for this study

## **CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION**

### **4.1 Introduction**

In this chapter, the results of the empirical estimations and their economic interpretations are presented. The chapter begins with presentation of the descriptive statistics of all the variables in the estimable model. The subsequent sections present the pre-estimation tests and the model estimation results.

### **4.2 Descriptive Statistics**

Descriptive statistics were carried out to determine the statistical properties of the data. The main descriptive statistics included the mean, standard deviation, and the minimum and maximum values of the study model. The mean represents the average values of the respective variables for the period 2010-2017. The standard deviation measures the dispersion from the mean and it captures the degree of variability of the data variables. The minimum and maximum shows the minimum values and the maximum values of various variables between 2010 and 2017, under which observations under consideration are spread. The results of the descriptive statistics are presented in the Table 1 below followed by a brief discussion.

**Table 1: Descriptive Statistics**

Variable	Year	Obs	Mean	Std. Dev	Minimum	Maximum
Profitability	2010	7	3.62e+08	4.11e+08	0	9.94e+08
	2011	7	3.82e+08	3.25e+08	0	8.84e+08
	2012	7	2.80e+08	3.04e+08	541000	8.55e+08
	2013	7	2.39e+08	3.16e+08	-5.92e+07	8.56e+08
	2014	7	2.35e+08	2.66e+08	-4.17e+07	7.41e+08
	2015	7	1.73e+08	3.02e+08	-2.28e+08	5.04e+08
	2016	7	5.46e+08	6.06e+08	-2.18e+07	1.68e+09
	2017	7	2.16e+08	4.25e+08	-2.62e+08	9.36e+08
Leverage	2010	7	.290431	.1491518	0	.4537894
	2011	7	.2583886	.1258384	0	.3781715
	2012	7	.2714436	.0839019	.1602966	.4224684
	2013	7	.2648946	.0611137	.1950212	.3822331
	2014	7	.2231966	.0444817	.1472736	.2843184
	2015	7	.2326695	.0848399	.0996026	.3538274
	2016	7	.2627126	.2298832	.0567233	.7506267
	2017	7	.2173869	.0869959	.0906931	.3177519
Firm Size	2010	7	100.4286	29.72012	65	145
	2011	7	100.4286	29.72012	65	145
	2012	7	100.4286	29.72012	65	145
	2013	7	100.4286	29.72012	65	145
	2014	7	100.4286	29.72012	65	145
	2015	7	100.4286	29.72012	65	145
	2016	7	100.4286	29.72012	65	145
	2017	7	100.4286	29.72012	65	145
Asset Tangibility	2010	7	2.91e+09	3.25e+09	0	9.06e+09
	2011	7	3.34e+09	3.42e+09	0	9.46e+09
	2012	7	3.55e+09	3.33e+09	1.83e+08	8.92e+09
	2013	7	3.79e+09	3.47e+09	3.25e+08	9.05e+09
	2014	7	3.86e+09	3.51e+09	3.08e+08	8.71e+09
	2015	7	3.82e+09	3.56e+09	3.14e+08	8.68e+09
	2016	7	4.12e+09	3.88e+09	2.82e+08	9.40e+09
	2017	7	4.61e+09	4.77e+09	2.62e+08	1.32e+10

The First and second columns represent the independent variables of the study and years study respectively. These variables determine the dependent variable of the study which is firm growth. The third column represents the number of observations of the variables under study. Each of the independent variable had a total of 56 observations meaning that the study considered a total of 224 observations for the study variables and for the study period 2010-2017.

The fourth column captures the average values of the variables under study. The volumes of assets held by firms considered for the study had the highest mean of 5.46e+08 in 2016 and lowest mean of 1.73e+08 in 2015. The firms' use of leverage was highest mean in year 2012 when firms used 29.0431 percent debt in their capital structure and lowest 21.73869 percent in 2017; a year that was marred with a lot of uncertainty following a lengthy electioneering period. The mean firm size was fairly constant with firms employing 100.4286 employees. The year 2017 saw firms have the highest average in terms of tangible assets amounting to Ksh. 4.61e+09 with the lowest mean of Ksh. 3.34e+09 being experienced in 2011.

The fifth column has data on standard deviations. This shows the variation of the observations from the mean of the variables for each of the years that were considered. Profitability showed the greatest variability of 4.25e+08 in 2017 again highlighting the level of uncertainty in business as a result highly contested elections in 2017. Firms' size had constant variation in terms of the number of years the firms had been in existence. Variations in terms tangible assets was highest in 2017 (Ksh. 4.77e+09) and lowest in 2010 (Ksh. 3.25e+09).

Finally the sixth and seventh columns detail the minimum and maximum values of each study variables for each year under consideration respectively. For instance, firms reported minimum losses in 2010 and 2011 and maximum profitability of 9.94e+08 in the year 2010. Again firms used minimum leverage in year 2010 and 2011 and used maximum leverage of 75.06267 percent in the year 2016. The maximum number of years firms had existed were 145 while the minimum was 65 years.

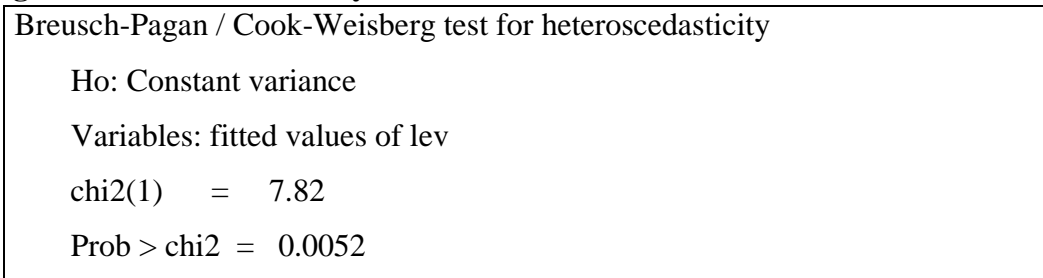


### 4.3 Pre- Estimation Tests

#### 4.3.1 Heteroscedasticity

Heteroscedasticity is the systematic change in the spread of the residuals over the range of measured variables. It's a problem because OLS regression assumes that all residual are drawn from a population that has a constant variance. The standard error component panel data model assumes that the disturbances have homoscedastic variances and constant serial correlation through the random individual effects (Hsiao, 2003). For this, this study carried out Breusch-Pagan Test to test for non-constant variance in the disturbance terms of the model. The null-hypothesis of the test is that the variances of the error term are constant (Homoscedasticity). As shown in the Figure 1 below, the test-statistic is 7.82 and the p-value is slightly above 5 percent hence the data was free of heteroscedasticity.

**Figure 1: Heteroscedasticity Test Results**



#### 4.3.2 Hausman test for Fixed and Random effect

This test is usually performed on panel data regression model to determine the most appropriate model for the study. To do this, both the fixed and random effects models were run first and the Hausman test conducted. If the p-value is to be found less than critical value, then a fixed effect model was to the appropriate model, otherwise random effect model is to be ran. From Figure 2 below, the results showed a chi-square probability of 14.03 percent which is above 5 percent implying that we fail to reject the null hull hypothesis and conclude that the random effect model was appropriate. Having determined that random effect model was appropriate, the study then proceeded to determine the Breusch and Pagan Langrangian multiplier test for random effect model.

**Figure 2: Hausman Test Specification Results**

	coefficient			
	(b) Fixed	(B) Random.	(b-B) Difference	Sqrt (diag (v_b-v_B)) S.E
firmsizeage	0.00155	0.0017	-0.0002	0.00015
ln_Profitability	-0.0096	-0.0052	-0.0044	0.0049
Ln_Asset_tan	0.0267	0.0176	0.0090	0.0051

b=consistent under Ho and Ha; obtained from xtreg B=inconsistent under Ha, efficient under Ho; obtained from xtreg	
Test :	Ho: difference in coefficient not systematic
	$\text{Chi}^2(3) = (b-B)'[(v_b-v_B)^{-1}](b-B)$ $= 5.47$
	$\text{Prob}>\text{chi}2 = 0.1403$

### 4.3.3 Random Effect Heteroscedasticity

According to the standard error component panel data model, it is assumed that the disturbances have constant variations and constant serial correlation through the random individual effects (Hsiao, 2003). These may be restrictive assumptions for a lot of panel data applications and hence the rationale for a Breusch and Pagan Lagrangian multiplier test for random effect under the null hypothesis of no heteroscedasticity as shown in Figure 3 below.

### Figure 3: Random Effect Heteroscedasticity Results

Breusch and Pagan langrangian multiplier test for random effects

$$\text{Lev}[\text{year},t]=Xb+u[\text{year}]+e[\text{year},t]$$

estimated results:

	var	Sd=sqrt(var)
lev	0.0124	0.1112
e	0.0110	0.1048
u	0	0

Test:  $\text{var}(u) = 0$

Chibar(01) = 0.00

Prob > chibar2 = 1.0000

From the above results, we accept the null hypothesis and concluded that the OLS residuals do not contain individual specific error components hence no heteroscedasticity.

#### 4.3.4 Correlation Analysis

Correlation analysis brings out the nature of the relationship between and among variables of the model(s) used in the study (Wooldridge, 2013). Correlation ranges between -1 and 1 indicating strong negative and positive correlations respectively. Correlation values may vary across variables indicating strong or weak correlation between variables as indicated in Figure 4 below.

The results indicated that there exists a positive but weak correlation between leverage and firm size since the correlation coefficient was 0.3938. This could be attributed to the fact the proxy for firm size was the number of years the firms had existed and traded in country. Though a firm's age is an important determinant of dynamics of the firm, it is expected that as a firm ages, it grows in size as it has better dynamic ways of adapting in the market

that any new market entrants and competitors. This study found contractor results with Audo (2014) who found that the probability of firm failure, firm growth, and the variability of firm growth decrease as firms age.

The results also indicate a very weak positive correlation between profitability growth and leverage since the correlation coefficient is 0.0342. This finding was contradictory with theory that asserts that, as firm grow, they tend to minimize use of debt as debt tends to increase agency costs (Jensen and Meckling, 1976). Use of leverage comes with risks by the lenders who may have to cover themselves through increasing interest rates which are costs to the firms (Shubita, & Alsawalhah, 2012). In the long-run, too much debt may discourage shareholders who may opt to withdraw their capital (Azhagaiah & Gavoury, 2011).

Similarly, the results showed very weak positive correlation between leverage and asset tangibility, firm size and profitability, a negative weak correlation between firm size and asset tangibility. As a firm grows the value of assets determine the leverage that a firm can use thus the positive relationship between leverage and asset tangibility (Skoogh, & Swärd, 2015). This relationship exists because tangible assets are used as collateral for the debt Theory asserts that as a firm grows, the profitability equally increases (Abor, 2005). This was in agreement with results indicated a positive strong correlation of 0.5841 between profitability and asset tangibility. As firm grows profitability and assets grow.

**Figure 4: Correlation Analysis Results**

Variables	Lev	firm size	ln_Pro	ln_Ass_Tan
Lev	1.000			
Firm size(age)	0.394	1.000		
ln_Profitability	0.034	0.026	1.000	
ln_Asset_Tan	0.070	-0.159	0.584	1.000

#### 4.3.5 Multicollinearity Test

This test was carried out to determine the extent to which independent variables are correlated. To do so, the study opted to analyze the variance inflation factor of each of the independent variables to assess their relative influence. From correlation analysis in Figure

4 above, the correlations were not high and this was an indication that Multicollinearity may not have been a problem. To verify this, a Multicollinearity test was conducted and results shown in Figure 5 below. The results showed that the variance inflation factor (VIF) is less than 10 and hence there was no linear association between independent variables.

**Figure 5: Multicollinearity Test Results**

Variable	VIF	1/VIF
firmsizeage	1.59	0.629
ln_Profitability	1.55	0.645
ln_Asset_Tan	1.05	0.954
Mean VIF	1.40	

#### **4.4 Model Estimation Results**

Table 2 below shows that the OLS model results were fitted at 0.05 significance level (F=8.244 and P<.0002). The Adjusted  $R^2$  shows that 34.1 percent variation in firm's growth is explained by leverage, age of the firm, and profitability.

**Table 2: Growth Models Estimation Results**

	Pooled OLS Growth of the Firm	Random Effect Model Growth of the Firm
Leverage	1.498 (1.456)	0.110 (0.432)
Age of the Firm(Size)	-0.00991 (0.00590)	-0.000446 (0.0138)
Firm Profitability	0.375*** (0.0803)	0.0172 (0.0301)
Constant	15.15*** (1.623)	21.11*** (1.535)
Observations	43	43
Adjusted R <sup>2</sup>	0.341	
F-Stat	8.24	
Prob > F	0.0002	
Prob > chi2		0.9514
Number of groups		7

Standard errors in parentheses \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

From the results above, the study's pooled OLS model of the study is indicated below:

$$\text{Growth of the Firm} = 15.15 + 1.498 * \text{Leverage} - 0.00991 * \text{Age of the Firm} + 0.375 * \text{Profitability}$$

From the above results, leverage and profitability positively impacted firm's growth while the age of the firm was negatively associated with growth of the firm. Therefore, holding all other factors constant, an increase debt by one unit increases growth of the firm increases by 1.498 units and increasing profitability by one unit, grows the firm by 0.375 units. On the contrary, an increase in the age of the firm by one year, reduced the growth of the firm by 0.00991 units.

## **CHAPTER FIVE: CONCLUSION**

### **5.1 Introduction**

The main objective of this study was to investigate the impact of leverage on growth of agricultural firms listed at the NSE for the period 2010-2017. Specifically, this study sought to investigate how leverage affects growth, and general financing patterns by these firms. The study used a sample of 57 agricultural firms that had traded consistently for the period 2010-2017. These firms entered the final sample on the basis that they had consistent data for all the variables of the study.

### **5.2 Summary of the Key Findings**

The study found leverage and profitability positively impacted firm's growth while the age of the firm was negatively associated with growth of the firm. The fact that age negatively impacted firm's growth was contradictory as it expected that as a firm grows in age, then it gains a lot in terms of market share, customers and general industry experience that may help it adapt in both good economic times and tough times.

### **5.3 Policy Implications**

The research findings that leverage positively and significantly affected the growth of the agricultural firms in Kenya, is key for agricultural financiers who may have interest in funding agriculture in Kenya through these firms. It would also mean that many agricultural firms are not strong financially to fund their growths and yet it is known that agriculture is the backbone of the Kenyan economy and hence the rationale for government to invest in these agricultural firms even as it endeavors to make the country food secure through the Big Four Agenda as enshrined in the Third Medium Term Plan of the Vision 2030. The finding that firm size as proxied by number of years of existence negatively impacted growth only means that it is not how old a firm is that determines how well it grows, but other factors like profitability are key for any investor to consider before investing in agriculture in Kenya.

### **5.4 Conclusion**

The study also found that as leverage increases, so does growth and yet it is also expected that as a firm grows, it has better profits and hence less need for debt in the capital structure. This was indicative that many agricultural firms are borrowing to finance their growths in

Kenya. The study also concluded that as agricultural firms grow old and stay for long in the sector, it does not necessary mean that they are growing in size.

### **5.5 Study Limitations**

The study only managed to use 57 of the listed firms as many did not have consistent data on the study variables, while others had not traded consistently. The study also was limited in the study period as majority of the firms had recently been listed and were on and off the NSE. This meant that the study was limited on the representativeness as conclusions are only on basis of 57 agricultural firms while Kenya has many firms in the agricultural sector.

### **5.6 Areas for Further Research**

The study proposes that more research should be conducted on other factors that determine growth of the agricultural firms in Kenya other than leverage, profitability, sector, age and size. There are other factors such as government policy, market forces, and culture that play a lot of role in determining the growth of the firms other than these. Furthermore, studies that would focus on both listed and unlisted firms would have more credible findings that would suffice for policy.



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