ANALYSIS OF FIRM SIZE, LEVERAGE AND FINANCIAL PERFORMANCE OF NON- FINANCIAL FIRMS IN NAIROBI SECURITIES EXCHANGE, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented in any other institution in its present form and manner for the fulfillment of the requirements for the award of a degree.

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DEDICATION

To my parents Mr. and Mrs. Samuel Wayongah: To my wife Lynette Atieno, My lovely Kids, Wendy, Lavender, Elton, Lizan and Devine and to my siblings: Grace, Janet, Raphael, Erick and Jastus.

ABSTRACT

Non-financial firms listed in the Nairobi Securities Exchange (NSE) have faced numerous challenges ranging from declining after tax profits, delisting or suspension at 21.3% between 2012 and 2018. This indicates that financial leverage also remains a challenge. Further, studies reviewed on leverage-performance and firm size-performance relationships posted mixed results. While the reported studies have been conducted elsewhere, no known study has attempted to integrate the three variables: financial leverage, firm size and financial performance. Therefore, the purpose of this study was to analyze firm size, financial leverage and financial performance of non-financial firms listed in NSE, Kenya. Specifically, the study sought to establish the effect of financial leverage on financial performance; determine the influence of firm size on financial performance and assess the moderating effect of firm size on the relationship between financial leverage and financial performance of listed non-financial firms in the NSE. The study was anchored on Economies of scale, trade-off, Signaling and Net operating income theories. The study used a correlation research design. The target population was 47 non-financial firms listed at the NSE between 2012 and 2018 where 28 firms were purposively sampled and pooled for 7 years to obtain 196 firm year observations. Secondary data was obtained from audited financial reports using data collection sheets. The data was analyzed using fixed effects panel regression. Results show that financial leverage is a significant positive predictor of performance (ROE), $\beta = 0.141$ ($p = 0.043$) and Tobin's Q, $\beta = 0.022$ ($p = 0.007$). This means that a unit change in financial leverage leads to a significant increase in ROE and Tobin's Q of 0.141 and 0.022, respectively. Firm size is a significant positive predictor of performance (ROE), $\beta = 0.097$ ($p = 0.020$) and Tobin's Q, $\beta = 0.058$ ($p = 0.0001$) meaning that a unit change in firm size leads to a significant increase in ROE and Tobin's Q of 0.097 and 0.058, respectively. Model coefficient interaction term was negative but significant for (ROE) $\beta = -0.083$ ($p = 0.001$) and Tobin's Q, $\beta = -0.037$ ($p = 0.001$) which implies that firm size negatively moderates the relationship between financial leverage and performance. The study concludes that financial leverage and firm size significantly affect firm performance positively and firm size moderates the relationship between financial leverage and performance. The study recommends that the management should enhance financial leverage and sales; and managers should always consider the size of the firm in making leverage choice decisions. Findings may be useful to academia as a basis of further research in finance.

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ABBREVIATIONS AND ACRONYMS

CMA   Capital Markets Authority

COMESA   Common Market for Eastern and Southern Africa

ATS   Automated Trading System

BRVM   Bourse Régionale des Valeurs Mobilières

DER   Debt-Equity Ratio

EGX   Egyptian Exchange

EPS   Earnings per Share

ETFs   Exchange Traded Funds

GDP   Gross Domestic Product

NSE   Nairobi Securities Exchange

OLS   Ordinary Least Squares

POT   Pecking-Order Theory

ROE   Return on Equity

SMEs   Small and Medium Enterprises

SRM   Specialized Receiver Manager

TOT   Trade-Off Theory

WTO   World Trade Organization

OPERATIONAL DEFINITION OF TERMS

Debt to Equity: Shows how much of the company assets belong to shareholders.

Financial Performance: This is a measure of how well a firm can use assets from its primary mode of business and generate revenues. This term is also used as a general measure of a firm's overall financial health over a given period of time.

Firm Size The production and turnover capacities possessed by a firm.

Leverage The use of various financial instruments or borrowed capital, such as margin, to increase the potential return on an investment.

Kenyan Capital Market (NSE) - The only organized securities market in Kenya.

Listed Firm All firms excluding insurance and banking institutions (Non- financial firms).

Return on Equity: A measure of how well a company used reinvested earnings to generate additional earnings, equal to a fiscal year's after-tax income (after preferred stock dividends but before common stock dividends) divided by book value, expressed as a percentage. $\dfrac{Net\ Income}{Shareholders'\ Equity}$

Shareholders: Shareholders are people who have bought shares in a limited liability company. They own a part of the company in exact proportion to the proportion of shares which they own

Market Capitalization: This represents the aggregate value of a company or stock. It can be obtained by multiplying the number of shares outstanding by their current price per share.

Tobin's Q: The ratio of the market value of a firm's assets to its assets replacement value. $\dfrac{Market\ Capitalization}{Book\ Value\ of\ Net\ Assets}$

CHAPTER ONE
INTRODUCTION

This chapter describes the background information, the research problem, objectives of the study, significance of the study and organization of the study.

1.1 Background of the Study

The financial performance of a firm relates to the process by which limited resources at organization's disposal are utilized effectively and efficiently in attaining the general objective of the enterprise for both present and future opportunities. However, financial leverage on the other hand is a measure of how much firms use equity and debt to finance their assets. Financial leverage measures firm's exposure to the financial risk. A high level of financial leverage allows shareholders to obtain a high return on equity, but they are also exposed to a higher risk of significant loss, if the return on assets is lower. The financial leverage employed by a firm is intended to earn more on the fixed charges funds than their relative costs (Pandey, 2010). Net Operating Income Approach theory by Durand (1952) asserts that the market value is dependent on the operating income and the associated business risk of the firm. Both these factors cannot be impacted by the financial leverage. Financial leverage can only impact the share of income earned by debt holders and equity holders but cannot impact the operating incomes of the firm. Therefore, change in debt to equity ratio cannot make any change in the value of the firm. The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions. Therefore, the role of financial leverage in magnifying the return to the shareholders is based on the assumption that the fixed- charges funds can be obtained at a cost lower than the firm's rate of return on net assets (Pandey, 2010).

Theoretically, Ross (1977) laid down the foundations of signaling theory in which he assumed that managers have a better knowledge about the true distribution of a future returns of the firm whereas investors are notably the providers of long term debt represented by financial leverage. The type of financing that a company uses can provide a signal of the firm's financial position and project prospects. When a company uses debt to fund a project, it could indicate that the company believes the project will provide returns quickly and sufficient enough to repay the debt so its current investors retain the benefits. If a company uses new equity to fund a capital project, it could be interpreted either as a signal that the company has no internal profits or is unable to raise any debt. According to Pandey (2010),

capital comes from three broad sources: internal funds, debt and equity. If both internal financing and debt are not available, then as a last resort, the firm will raise new equity. The rate of interest on debt is fixed irrespective of the company's rate of return on assets. Financial leverage employed by a company is intended to earn more on the fixed charges funds than their costs. As debt increases, financial leverage also increases (Pandey, 2010).

Brealey and Myers (1991) identified financial leverage as one of the unresolved problems in corporate finance. Surveys of empirical studies reveal that consensus has not been reached on the relationship between financial leverage and financial performance. Literature reviewed indicates that financial leverage still remains a challenge in the management of most non-financial firms listed at the NSE. Records at the NSE reveal that in the period 2012 - 2018, financial leverage has oscillated from 20.84% to 77.04% (NSE Handbook, 2018).

Previous studies on financial leverage and financial performance relationship can be traced from the studies of (Gleason et al., 2000; Enekwe et al., 2014; Ojo, 2012; Abor, 2005; Onaolapo and Kajola, 2010) who found a significant negative relationship between leverage and firms' performance. These studies used single sector, cross- sectional data, convenient sampling and time series, employed ex-post facto research design, Least Squares (OLS and correlation to study operating leverage and performance relationship of listed firms. Majority of the above studies have been conducted in developed countries where capital markets are well-developed. However, in Kenya, Maina and Ismail (2014); Mule and Mukras (2015); Nyatete et al., (2018) uses various panel data procedures, descriptive, regression and correlation to study all listed firms at NSE and found negative relationships between leverage and performance. The studies concluded that financial leverage is an important negative predictor of financial performance. All these studies included financial sector firms whose leverages are highly regulated by the central bank. Therefore, the nature of the data limits the generalization of the findings to other firms in the economy.

In contrast to the above views, some studies have found positive relationships between financial leverage and financial performance. These include (Rehman et al., 2013; Berger & Bonaccorsi di Patti, (2006); Akbarian, (2013); and Amjed, (2007). These studies used dynamic panel data techniques, single sectors and single accounting measures, correlation analysis and cross- sectional data. Akbarian (2013) uses the omission sampling method and multiple regression but does not incorporate, time series component while, Berger and

Bonaccorsi (2006) used parametric measures but ignores cross- sectional aspects of the data. All these studies used either single accounting or market based measures of performance but did not employ panel methodology.

Previous studies conducted in NSE by Maina and Ismail (2014), Mule and Mukras (2015) and Nyatete et al., (2018) have attempted to link financial leverage and financial performance focusing on all listed firms however, no studies have attempted to determine the relationship between financial leverage and financial performance of non-financial firms listed in the NSE using ROE and Tobins Q as measures of performance and panel methodology. Use of panel methodology accounts for individual heterogeneity which cannot be detected using purely cross -sectional or time series data which is the focus of the present study. Besides that, non-financial firms' leverages are not regulated by the Central bank.

Firm size has also been considered a fundamental variable in explaining firm performance by the researchers and a number of studies have investigated the effects of firm size on firm performance. The underlying theoretical basis for arguing that firm size is related to firm performance can be found in the traditional neoclassical view of the firm and the theory of economies of scale. This theory dates back to Adam Smith in his famous First Book of Wealth of Nations (1776) containing the idea of obtaining larger production returns through the use of division of labor. Theory of economies of scale prescribes that increasing firm size allows for incremental advantages because the size of the firm enables it gain leverage on the economies of scale to attain higher profitability. According to Papadogonas (2006), economies of scale may occur for various reasons including financial; organizational reason and technical reason among others. The theory of economies of scale postulates that large firms perform better than smaller firms due to discounts they access on large quantity buying, better interest rates and division of high fixed costs across large number of units. These firms also enjoy specialization of labor and can take advantage of fields requiring huge capital outlay. This theory helped this research to establish the extent to which the firms' financial performance is anchored on the economies of scale due to their sizes.

A review of validity of the relationship between firm size and firm performance across different firms globally indicate that Amato and Burson (2007); Lee (2009); Vijayakumar and Tamizhselvan (2010); Akbas and Karaduman (2012); Pervan and Višić (2012); Akinyomi and Olagunju (2013); Mehrjardi and Ngahu (2012); Bisher (2011) and Kaguri (2013) have

found a positive relationship between firm size and firm performance using ordinary least square regression, multiple regression model, multivariate statistical method, multi ratio model and either single accounting or market based measures of performance. On the contrary, Becker et al., (2010), Jonsson (2007), Salawu, et al., (2012) have found a negative relation between firm size and performance using Pooled OLS, Generalized Method of Moment panel model, fixed effect dynamic panel data model, correlation analysis and accounting based measures of performance thereby contradicting the theory of economies of scale.

In Kenya, existing literature on the relationship between firm size and financial performance can be traced from the studies of Bisher (2011) and Mehrjardi (2012) who assessed the link between firm size and financial performance of commercial banks in Kenya; Kaguri (2013) who studied the relationship between firm characteristics and financial performance of life insurance companies in Kenya. The studies employed descriptive research design, regression analysis and ROA as the dependent variable. Their findings revealed that size had a positive correlation with financial performance. All these studies focused on financial firms and single accounting measure of performance but failed to test the combined synergetic effect of accounting measures and market based measures of performance. Mule et al., (2015) however studied the relationship between firm size and financial performance and found mixed results using different measures of performance implying that performance depends on the measure used having studied also all listed firms including financial firms which are highly regulated by the central banks.

The reviewed studies above focused on all listed firms or financial firms which are highly regulated by the central bank. They also used single set of performance measures but did not test the combined synergetic effect of accounting measures and market based measures of performance. An attempt to determine the relationship between firm size and financial performance of non-financial firms listed in NSE using accounting based and market based measures of performance (ROE and Tobins'q) and panel methodology has not been done in a single research. Therefore, the current study sought to fill this gap by determining the influence of firm size on financial performance of non-financial firms listed in the NSE using accounting and market based measures of performance and panel methodology.

Trade off theory posits that companies determine their capital structure based on the benefits and costs of debt, and increase their leverage ratio to the point where the marginal costs and benefits of debt are equal (Fama and French, 2002). The reasoning behind trade off theory also permits to make the following predictions. First, a positive relationship between financial leverage and financial performance is expected, since debt enables firms to lower their tax expense and agency problems. Second, company size and leverage are also expected to be positively linked. The rationale is that larger firms are more diversified and thus less prone to bankruptcy (De Jong et al., 2011). Since size may be viewed as an inverse proxy for bankruptcy risk, larger firms have consequently a higher borrowing capacity and attempt to benefit from this. Additionally, smaller companies are able to borrow less because of higher agency costs (Dang, 2013). The trade-off theory also postulates a positive relation of tangibility as more tangible firms can deploy more debt to gain tax benefits at low cost by using their assets as collateral. Based on these facts, literature has generally failed to consider the moderating role of some variables on the link between financial leverage and its determinants. The studies that included them, focused on the role of size and its influence on the financial leverage, firm size and financial distress or firm size and performance relationship. There is a dynamic financial leverage and performance link which varies in magnitude along the company size spectrum (Vithessonthi & Tongurai, 2015). In this case, borrowing capacity grows with firm size. This enables companies to increase their leverage ratio and make more investments. Therefore, this theory helped this research to establish the extent to which firm size affects the relationship between financial leverage and financial performance.

The review of literature on the moderating role of firm size indicates that scanty research has been done on this variable. Jaggi & Gul, (1999); Gonzalez & Gonzalez (2012); Vithessonthi and Tongurai (2015); La Rocca (2007); Gleason et al., (2000); Abbasi and Malik (2015); Chao (2012); Yung-Chieh (2013), have found positive impacts on the relationships using dynamic panel data tests, panel regression, descriptive model, Regression analysis, Hierarchical regression with convenience sampling and linear Structural Equation Modeling (SEM), cross–sectional data, Hierarchical moderated regression analyses and Generalized linear model (GLM) regression analysis. Some of these studies focused on either community retailers or on all registered firms, while the rest focused only on one sector, small and medium enterprises as opposed to listed firms. Besides that, they used single accounting based measures of performance. These studies

found a positive relationship. On the contrary, Farooq et al., (2014) applied linear model (GLM) regression analysis with unbalanced panel data analysis and found a negative relationship, however, cross- sectional component of the data was ignored and the study focused on only one sector.

In Kenya, Muigai (2017) investigated the moderating effect of firm size on the relationship between capital structure and financial distress of 40 non-financial firms listed in the NSE between 2006 and 2015. Feasible Generalized Least Squares (FGLS) regression results revealed that firm size has a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. Firm size was measured using the natural logarithm of total assets, however the current study used ratio of sales to total assets to measure firm size because it is simple and easily understandable.

From the existing literature, there are only a limited number of scholars who have studied the moderating effects in financial structure determinants, however the moderating effects were measured using dummies, subsamples or simple interaction terms in tabulated form, single accounting based measures of performance and failed to test the effect of both accounting based and market based measures of performance of listed non-financial firms. These approaches do not enhance the interpretability of the findings and may result in an inaccurate depiction of the nature of the relationship. It is also noted that majority of the studies were mainly drawn from the developed nations where capital markets are well-developed with fewer studies from developing countries. In such countries, capital market is relatively under developed. Therefore literature on the moderating effect of firm size on financial leverage-performance of non-financial firms listed in NSE is unknown. Besides that, no known study has integrated the three variables: namely financial leverage, firm size and financial performance using panel methodology with ROE and Tobins'Q as proxies of performance in a single research for listed non-financial firms in a frontier market like the Nairobi Securities Exchange. Hence, the current study assessed the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE.

The Nairobi Securities Exchange is licensed and regulated by Capital Markets Authority (CMA). It has the mandate of providing a trading platform for listed securities and overseeing its member firms. The Capital Markets Authority is the government regulator

charged with licensing and regulating the capital markets in Kenya. It also approves public offers and listings of securities traded at the Nairobi Securities Exchange. It was constituted as a voluntary association of stock brokers under the Societies Act. In 1990, a trading floor and secretariat was set up at the IPS building, before moving to the Nation Centre Nairobi in the year 1994. Over the past decade, the securities Exchange has witnessed numerous changes, automating its trading in September 2006 and in 2007 making it possible for stockbrokers to trade remotely from their offices, doing away with the need for dealers to be physically present on the trading floor. Trading hours were also increased from two hours to six hours. The relocation to Westlands in the environs of Nairobi symbolically marked the end of an era where the market was owned and run by stockbrokers. Automated trading system (ATS) was introduced in 2006 making significant steps in capital markets in providing liquidity. Investors at the Nairobi Securities Exchange (NSE) are set to trade in stock and index derivatives heralding a new dawn in Kenya's 60-year old bourse. The Nairobi Securities Exchange aims at supporting trading clearing settlement of equities, debt securities or bonds, derivatives, real estate and other associated instruments. There are currently 60 licensed firms under the Nairobi Securities Exchange.

The Nairobi Securities Exchange (NSE) posted a solid performance in the wake of a challenging macro-economic environment characterized by drought, weak credit growth and a protracted electioneering period. The bourse posted a 19% growth in profit after tax on account of increased equities levies occasioned by improved equity trading turnover in 2017-2018. The NSE continued to deliver on its group's corporate strategy through key initiatives. During the year, the NSE launched its Exchange Traded Funds (ETFs) market and listed the first ETF, the Barclays New Gold ETF. To enhance financial inclusion and democratize access to the securities market, and in partnership with other stakeholders the NSE launched the M-Akiba; a government infrastructure retail bond that is bought and traded via the mobile phone. The bond, which has a low entry level cost of $30 enabled the NSE get 300,000 new retail investors on to Kenya's bond platform and spur a savings and investment culture among the populace (NSE, 2018)

The annualized turnover of stocks traded on the New York Stock Exchange (NYSE) is now estimated to be over 100%, which means that on average an NYSE-listed non-financial firm experiences trading volume each year exceeding the total number of its issued and outstanding shares with more than 50% contribution to the national GDP. Non-financial firms

listed in Philippines on the other hand especially manufacturing sector grew by 8% percent on average between 2012 and 2018 (Second, after China in the region). Philippines was also the fastest growing economy in the world in 2012 with a GDP growth of 7.3% driven by the growing business process outsourcing and overseas remittances according to *"The Global Competitiveness Report 2010 - 2015"*. Meanwhile, Market capitalization has been on a general declining trend across all exchanges since 2015. This could be attributed to the general unfavorable economic conditions. 2017, however, marked an increase in Market capitalization for the Nairobi Securities Exchange and Casablanca Stock Exchange. Despite a great year on the main US markets in 2017, many African stock exchanges offered USD investors a higher return. Biggest gain in USD was the Malawi Stock Exchange index, which climbed by 56.0%. It was among 6 African exchanges that outperformed the tech-heavy Nasdaq, which scored a strong 28.2% gain in 2017. Other leading African stock exchange indices included Ghana, up 43.8%, Uganda up 30.7%, Mauritius 29.9% and South Africa JSE All Share up 29.7% (Chanetsa, 2019).

Senegal, Togo, Niger, Mali, Cote d'ivoire, Ginuea Bissau, Burkina Faso and Benin all Shares Index; the Bourse Régionale des Valeurs Mobilières (BRVM). The cumulative average performance of the Bourse Régionale des Valeurs Mobilières for the period from 2012 to 2018 is established at +11.26 %, making BRVM one of the best performing stock exchanges on the continent. Between 2012 and 2016, the BRVM experienced a cumulative growth of + 88 % in its composite index. In the same period, Egyptian Exchange (EGX) indices significantly surged; EGX 30, rose by 22%, pushing the market to occupy the first place among Arab markets. The Egyptian market maintained its position as a best performer compared to other world markets since June 2013, according to Morgan Stanley, (2018). In Addition, EGX70 and EGX100 indices rose up by 79% and 80%, respectively. The significant improvement in EGX market performance was manifested in the market's trading aggregates during the year, where the main market value traded surpassed EGP 296 billion, out of which EGP 256 billion were for stocks only (Chanetsa, 2019).

In Kenya, the listed firms account for a significant proportion of the gross domestic product (GDP). In the year 2018, listed firms contributed about 13.4% of the GDP (GoK, 2018). Despite their immense contribution to the economy, firms quoted at the NSE continue to face numerous challenges ranging from declining profits, increasing debt levels, suspension and delisting, unfavorable economic and regulatory environment (NSE Handbook, 2018, CMA

reports 2018). Empirical research in this domain has attributed these problems to diverse factors such as inept corporate governance, severe competition for markets, uncertain political environment and factors of production as well as adverse economic performance.

Statistics from the NSE indicate that, financial firms have delivered an average operating profit margins of 42% more than double the average 19% from non-financial firms between 2012 and 2018. Financial firms have also dominated on net profit margins at 30% on average against 13% for non-financial firms during the same period. Total debt has also increased at a faster rate, from KES 36bn to KES 278bn in the same period. Consequently, net debt position has increased to KES 85bn in 2018 from KES 42bn in 2012 NSE (2018). Generally, financial leverage and firm size have been recognized in the literature as fundamental variables that explain organizational performance. In the year 2018, listed non-financial firms at the NSE contributed about 13.4% of the GDP. Despite their contribution to the economy, they continue facing numerous challenges ranging from declining profits, increasing debt levels, suspension or delisting at 21.3% from the NSE. Statistics indicate that, while market capitalization at NSE increased from KES 989.69 billion in December 2012 to KES 2778.6 billion in December 2018, 39% of these firms have recorded falling after-tax profits for the same period (NSE, 2018). On the contrary, non-financial firms listed at New York Stock Exchange have recorded increased after tax profits of 67% with market capitalization of more than KES.1600 trillion for the same period (NYSE, 2018).

1.2 Statement of the Problem

Financial performance remains a major challenge to most non-financial firms listed at NSE. Statistics indicate that, while market capitalization increased from KES 989.69 billion in December 2012 to KES 2778.6 billion in December 2018, 39% of listed non-financial firms have faced numerous challenges ranging from declining after tax profits, delisting and suspension from the NSE at 21.3% despite the political stability being enjoyed in the country and improved access to funding occasioned by the economic reforms that would make a wider range of financing instruments available to businesses. Because of these, performance of firms was expected to reflect better economic risk and sovereign risk environments. Records at the NSE also reveal that financial firms have delivered an average operating profit margins of 42% more than double the average 19% from non-financial firms. Financial firms have also dominated on net profit margins at 30% on average against 13% for non-financial firms during the same period. Total debt increased at a faster rate, from KES 36bn to KES

278bn in the same period. This indicates that financial leverage also remains a challenge. Most of the studies reviewed posted mixed results with some researchers reporting positive relationships while others reported negative relationships. Besides that, the studies reviewed on this context, either explored direct leverage-performance relationship or direct firm size-performance relationship while focusing on either time series or cross sectional data with only one set of performance measures. While the reported studies have been conducted elsewhere, no known study has integrated the three variables: financial leverage, firm size and financial performance using Return on Equity and Tobin's Q as accounting and market based measures of performance respectively and panel methodology to study listed non-financial firms at the Nairobi Securities Exchange. The study therefore sought to analyze the relationship between firm size, financial leverage and financial performance of non-financial firms listed in the Nairobi Securities Exchange, Kenya (NSE).

1.3 Objectives of the Study

The main objective of the study was to analyze firm size, financial leverage and financial performance of non-financial firms listed in the Nairobi Securities Exchange, Kenya.

1.3.1 Specific Research Objectives

i) To establish the effect of financial leverage on financial performance of non-financial firms listed in the NSE.

ii) To determine the influence of firm size on financial performance of non-financial firms listed in the NSE.

iii) To assess the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE.

1.4 Research Hypotheses

i) H_0: Financial leverage has no effect on financial performance of non-financial firms listed in the NSE.

ii) H_0: Firm size has no influence on financial performance of non-financial firms listed in the NSE.

iii) H_0: Firm size has no moderating effect on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE.

1.5 Significance of the Study

The present research was necessary because of the inconsistency reported in prior studies on the relationship between financial leverage and financial performance and the fact that no known studies have attempted to integrate the three variables: financial leverage, firm size and financial performance of listed non-financial firms in a single research. Besides that, no known study has been carried out on the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the Nairobi Securities Exchange (NSE) using Return on Equity (ROE) and Tobins'q as proxies of performance and panel methodology. This study therefore, used both ROE and Tobins'q as performance measures which may help shareholders make investment decisions. It may also benefit the entire Kenyan society, the government, the Capital Markets Authority, the Kenya Private Sector Alliance, institutional and individual investors. This information may provide non-financial institutions, consultants and entrepreneurs with the necessary tools to plan the financing of their businesses. The findings may also provide information for policy makers involved in promoting investment. It may also provide a basis for further research in financial structure that focuses on developing countries.

1.6 Scope of the Study

The scope of this study is evaluated in terms of subject, area and time. In terms of subject scope, this study was limited to the broad field of financial management and the subfields of corporate finance, financial economics and financial institutions and markets. The three study variables are drawn and shared between financial management, financial economics and corporate finance. Financial leverage is borrowed from the wide field of financial management while financial performance and firm size is shared between financial economics and corporate finance. In terms of area scope, the study was conducted at the Nairobi Securities Exchange (NSE) in Nairobi City Kenya, where listed firms' shares and bonds are traded. Listed firms were targeted because they file their annual audited financial statements and relevant data for the study was thus readily available.

In terms of time scope, this research was limited to seven years from 2012 to 2018. The base year 2012 was selected because it coincided with the pre General election of 2013 with the business failures and corporate scandals witnessed largely in the non-financial sector where some firms; Mumias sugar company, Eveready, Uchumi supermarkets, and Kenya Airways reported losses in terms of billions of shillings among others (Kenya Economic Survey,

2018). However, the year 2018 was chosen because it marked a period of peace and political stability after the famous ''Hand Shake'' in 2017 between the president and the opposition leader in Kenya. The performance of firms was thus expected to reflect better economic risk and sovereign risk environments as well as improved access to funding because economic reforms would make a wider range of financing instruments available to businesses.

The companies in the financial sector were excluded from the study inorder to remove any anomalies associated with this sector which is highly regulated by the central bank of Kenya on issues of liquidity, cash holdings, and provision for bad debts among other factors (Santos, 2001).

1.7 Conceptual Framework

Moderator Variable

FIRM SIZE
- Sales to Total Assets

Dependent Variable

Independent Variable

FINANCIAL LEVERAGE
- Debt to Equity

FIRM PERFORMANCE
- Return on Equity
- Tobin's Q

Control Variables

Firm's Age

Asset Tangibility
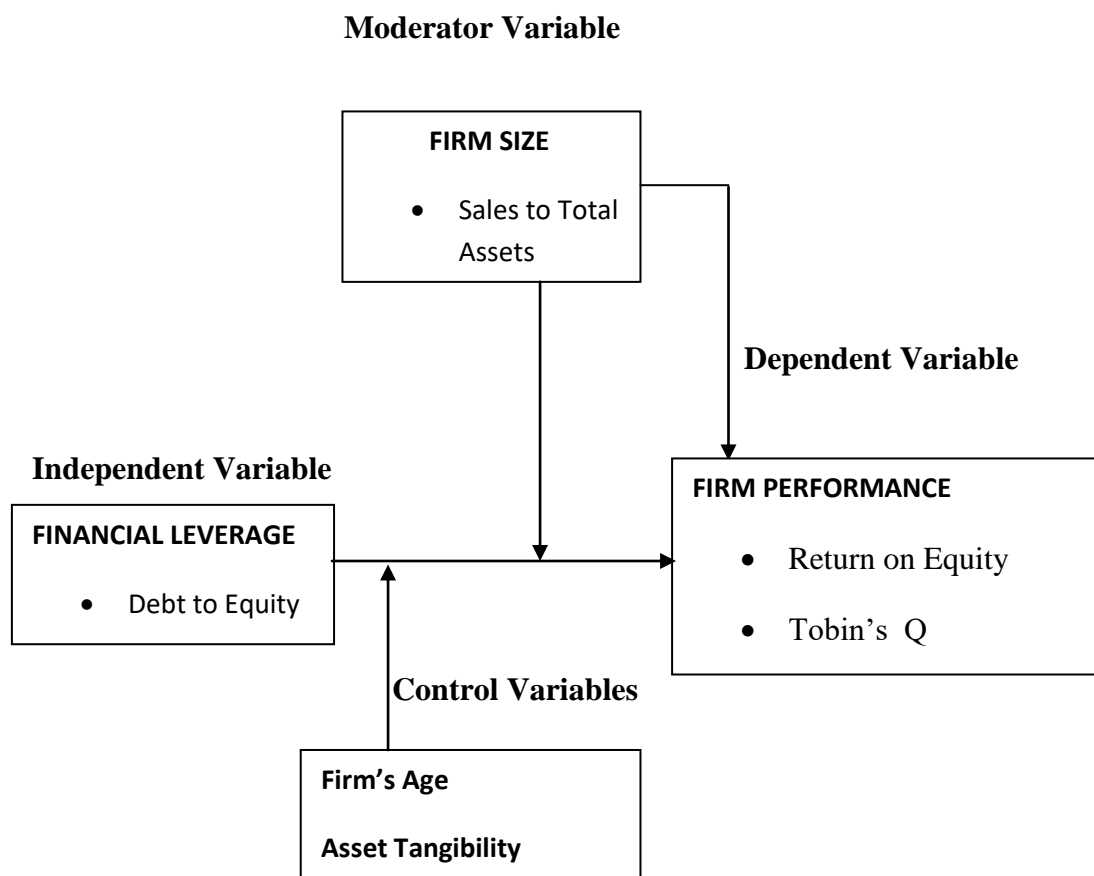
Figure 1.1: Firm Size, Financial Leverage and Financial Performance Relationship
Source: (Adapted from Abbasi & Malik, 2015).

Figure 1.1 shows a conceptual framework of the study which illustrates the perceived link between the independent variable (financial leverage) and dependent variable (firm's financial performance) as moderated by the firm size. The conceptual framework is adapted from Abbasi and Malik (2015) and modified to suit the research purpose. Abbasi and Malik (2015) investigated the moderating effect of firm size in the relationship of firm growth and firm financial performance of 50 non-financial firms listed in Karachi stock exchange. Therefore this study is relevant in conceptualizing this research. The modification of the model of Abbasi and Malik (2015) in the present study lies in the operationalization of financial leverage which replaced firm growth in Abbasi and Malik (2015) model.

This study adopted financial measures of performance used by Mule and Mukras (2015) namely; return on assets and Tobin's q as accounting and market based measures of firm performance respectively. In this study, performance of financial institutions are excluded unlike Mule and Mukras whose study measured the performance of all firms listed in NSE. Cole and Mehran (1998) observes that it is necessary to choose measures of performance that are quantifiable, expressive and comparable. Market-based indicators seek to predict future situations and are mostly driven by factors that cannot be controlled by the firm's managers. Accounting-based measurement was also used because it demonstrated a firm's current situation, and it is mostly driven by factors that can be controlled by the firm. This choice was motivated by the fact that these indicators have different interpretations regarding firm's performance as proposed by de Mesquita and Lara (2003).

Two control variables were introduced in the reconstructed conceptual framework namely; firm age and asset tangibility. They have been identified as drivers of performance (Majumdar and Chhibber, 1999), hence their inclusion as control variables. Firm size as a moderating variable was also introduced. Moderators are often introduced when there are unexpectedly weak or inconsistent relations between a predictor and an outcome across studies (Baron & Kenny, 1986). In this study, firm size as a moderating variable was measured by the ratio of sales to total assets while financial leverage was measured using debt to equity ratio.

CHAPTER TWO
LITERATURE REVIEW

This section explores the theoretical foundations of the study. It highlights the main theories that inform the study variables with the intent of identifying the research gap. It also covers the empirical studies on the subject area of focus.

2.1 Theoretical Literature Review

According to Kerlinger (1973), a theory is a set of interrelated constructs, concepts, definitions and propositions that present a systematic view of phenomena thereby specifying relations among variables. The main aim is to predict the phenomena. The concepts of financial leverage, firm size and firm performance are anchored on the theories of net operating income approach, signaling, trade-off and economies of scale.

2.1.1 Theory of Net Operating Income Approach

This approach was put forth by Durand (1952). The theory suggests that change in debt of the firm or the change in leverage fails to affect the total value of the firm. As per this approach, the WACC and the total value of a company are independent of the capital structure decision or financial leverage of a company.

The capital structure of a company is a mix of debt and equity in the company's mode of financing. This ratio of debt in the capital structure is also known as financial leverage. Some companies prefer more of debt while others prefer more of equity while financing their assets. The ultimate goal of a company is to maximize its market value and its profits. In the end, the question that emerges is the relation between the capital structure and value of a firm.

There is one school of thought advocating the idea that increasing the debt component or the leverage of a company will increase the value of a firm. On the other hand, increasing the leverage of the company also increases the risk of the company. There are various theories that establish the relationship between financial leverage, weighted average cost of capital and the total value of the firm. One such theory it the Net Operating Income Approach.

According to this approach, the market value is dependent on the operating income and the associated business risk of the firm. Both these factors cannot be impacted by the financial leverage. Financial leverage can only impact the share of income earned by debt holders and equity holders but cannot impact the operating incomes of the firm. Therefore, change in debt to equity ratio cannot make any change in the value of the firm.

It further says that with the increase in the debt component of a company, the company is faced with higher risk. To compensate that, the equity shareholders expect more returns. Thus, with an increase in financial leverage, the cost of equity increases. Therefore the concepts of financial leverage and performance are anchored on this theory. This therefore guided the study to establish the effect of financial leverage on financial performance of non-financial firms listed at the NSE

2.1.2 Theory of Economies of Scale

This theory dates back to Adam Smith 200 years back in his famous First Book of Wealth of Nations (1776) containing the idea of obtaining larger production returns through the use of division of labour. Theory of economies of scale prescribes that increasing firm size allows for incremental advantages because the size of the firm enables it gain leverage on the economies of scale to attain higher profitability. The underlying theoretical basis for arguing that firm size is related to firm performance can be found in the traditional neoclassical view of the firm and the concept of economies of scale. Economies of scale may occur for various reasons such as financial; organizational reason; technical reason etc. In line with this concept, a positive relationship between firm size and performance is expected. According to Papadogonas (2006), economies of scale occurs when a large firm negotiates for better interest rates or better discounts and rebates due to a large quantity that it buys. Further, he opined that specialization and division of labour as well as division of high fixed costs across large production volumes may often give rise to economies of scale. In line with this concept, the author postulated that large firms are generally financially robust hence the relevance of the economies of scale theory.

Economies of scale may occur for various reasons including financial; organizational reason; technical reason etc. The theory of economies of scale postulates that large firms perform better than smaller firms due to discounts they access on large quantity buying, better interest rates and division of high fixed costs across large number of units. These firms also enjoy

specialization of labor and can take advantage of fields requiring huge capital outlay. This theory therefore, helped this research to establish the extent to which the firms' financial performance is anchored on the economies of scale due to their sizes. This therefore guided the study to establish the effect of firm size on financial performance of non-financial firms listed at the NSE.

2.1.3 Signaling Theory

Ross (1977) laid down the foundations of signaling theory in which he assumed that managers have a better knowledge about the true distribution of a future returns of the firm whereas investors do not notably the providers of long term debt represented by financial leverage. He argued that firm's management being more informed about the firms' prospect may use signals that provide clues to investors about how management views the firms' prospects. He further indicated that financial leverage can be used by managers as a means of sending unambiguous signals to the public about the future performance of the firm. Therefore, the type of financing that a company uses can provide a signal of the firm's financial position and project prospects. When a company uses debt to fund a project, it could indicate that the company believes the project will provide returns quickly and sufficient enough to repay the debt so its current investors retain the benefits. If a company uses new equity to fund a capital project, it could be interpreted as either a signal that the company has no internal profits or is unable to raise any debt. According to Pandey (2010), capital can broadly come from three sources: internal funds, debt and equity. If both internal financing and debt are not available, then management, will resort to raising new equity. The reasons for this order of preference resides in the cost associated with issuing securities: the actual costs of issuance, and the costs stemming from the managers' private knowledge of the firm's actual value (Fama & French, 2002). However, large firms are generally financially robust and can therefore negotiate for better interest rates on debts, if preferred. Therefore, the concepts of financial leverage and performance are also anchored on this theory.

2.1.4 The Trade-off Theory

The theoretical base of trade-off theory was laid down by Myers (1984). Other researchers who also contributed to theory include; Fisher et al. (1989), Kim and Sorensen (1986). These proponents of trade-off theory suggest that the firm will borrow up to the point where the marginal value of tax shields on additional debt is just offset by the increase in the present value of possible cost of financial distress. In a perfect market, there is the

generalized assumption that there is free entry and exit of firms, ease of raising funds and no transaction cost to the firm.

According to trade-off theory, benefits and costs are associated with debt and firms should follow a targeted debt ratio where benefits are maximum against minimum loss (Graham, 2000; Kim and Sorensen, 1986).

According to Fisher et al., (1989), the trade-off point of financial leverage is achieved at the point where the marginal present value of the tax on additional debt is equal to the increase in the present value of the financial distress costs. Therefore, an optimal financial leverage results from balancing the value of interest tax shields against various costs of bankruptcy or financial distress. The main proposition of this theory is that, in the real world, firms rarely use a hundred percent debt capital. The reason behind this is that firms limit their use of debt to reduce their probability of financial distress and also that interest rate on debt becomes prohibitively high at high debt levels. The theory explains that firms are financed partially by debt and partly by equity and states that there is an advantage in financing with debt, the tax benefit of debt, the cost of financing distress including bankruptcy costs. The marginal benefit of further debt declines as debt increases while the marginal cost increases so that the firm that is optimizing its overall value will focus on this trade-off when choosing how much debt and equity to use for financing.

Trade-off theory posits that companies determine their capital structure based on the benefits and costs of debt, and increase their leverage ratio to the point where the marginal costs and benefits of debt are equal (Fama and French, 2002). The reasoning behind trade-off theory also permits to make the following predictions. First, a positive relationship between financial leverage and financial performance is expected, since debt enables firms to lower their tax expense and agency problems. Second, company size and leverage are also expected to be positively linked. The rationale is that larger firms are more diversified and thus less prone to bankruptcy (De Jong et al., 2011). Since size may be viewed as an inverse proxy for bankruptcy risk (De Jong et al, 2008), larger firms have, consequently, a higher borrowing capacity and attempt to benefit from this. Moreover, smaller companies are able to borrow less because of higher agency costs (Dang, 2013).

The trade-off theory also postulates positive relation of tangibility as more tangible firms can deploy more debt to gain tax benefits at low cost by using their assets as collateral.

Based on these facts, literature has generally failed to consider the moderating role of some variables on the link between financial leverage and its determinants. The studies that did include them, focused on the role of size and its influence on the financial leverage or performance relationship. There is a dynamic financial leverage and performance link which varies in magnitude along the company size spectrum (Vithessonthi & Tongurai, 2015). In this case, therefore, borrowing capacity grows with firm size, which enables companies to increase their leverage ratio and make more investments. In turn, this increases performance and firm size, thus establishing a link between financial leverage and financial performance.

2.1.5 Financial Leverage

Financial leverage is a measure of how much firms use equity and debt to finance its assets. A company can finance its investments by debt and equity. The company may also use preference capital. The rate of interest on debt is fixed irrespective of the company's rate of return on assets. The financial leverage employed by a company is intended to earn more on the fixed charges funds than their costs. As debt increases, financial leverage increases. The landmark studies of Modigliani and Miller (1958; 1963) about Capital structures irrelevance and tax shield advantage paved way for the development of other theories. According to Van Horne (2002), the change in capital structure that is caused by an increase or decrease in the ratio of debt to equity is referred to as financial leverage. Debt leverage is measured by the ratio of total debt to equity (debt/equity ratio). It shows the degree to which a business utilizes borrowed money. Companies that are highly leveraged may be at risk of bankruptcy if they are unable to make payments on their debt; they may also be unable to find new lenders in the future. Leverage is not always bad. However, it can increase the shareholders' return on their investment and make good use of the tax advantages associated with borrowing.

The role of financial leverage in magnifying the return of the shareholders' is based on the assumptions that the fixed- charges funds (such as the loan from financial institutions and other sources or debentures) can be obtained at a cost lower than the firm's rate of return on net assets (RONA or ROI).

2.1.6 Financial Performance of Firms

Corporate performance relates to the process by which limited resources at an organization's disposal are utilized effectively and efficiently in attaining the general objective of the enterprise for both present and future opportunities. To measure a firm's performance, many management researchers prefer accounting- based variables namely ROE, ROA and ROS. The idea behind these measures is perhaps to evaluate managerial performance i.e how well a firm's management uses the assets to generate accounting returns of investment, assets or sales. However, since these measures are used for investigating a firm's performance in terms of profitability, this study applies ROE and Tobins'Q as accounting and market based measures of performance respectively Pandey (2010). Even though ROE is seen as a single term measure of performance, the current study used ROE to measure performance because all the variables were found to be stationary across the years.

2.1.7 Firm Size

One of the firm specific factors not adequately researched that can also moderate the leverage-performance relation is the firm size. Firm size is viewed as significant factor that can affect the firm's relation with its external environment (Ebel Ezeoha, 2008). Since, larger firms have more capacity to influence their stakeholders, their role is more critical in corporate environment. Similarly, these firms play significant role in commercializing innovative ideas provided by small firms. From a macroeconomic perspective, much part of economic growth came from the growth of large size concerns. Therefore, with its increasing recognition to external business environment firm size can be an important ingredient to corporate finance decisions. This can variably affect the competitiveness of large and small firms which in turn affects their capital structure decisions.

The size of a firm has the potential to influence the firm's financial performance in terms of the choice of capital structure mix. Larger firms obtain benefits from their size and diversification because they can borrow with lower costs and survive economic disasters with more resilience than smaller firms. Consequently, this should enable them to perform better than smaller firms thereby generating more profit. Their diversification and low borrowing cost benefits are expected to support the profitability assumption.

The size of the firm affects its financial performance in many ways. Large firms can exploit economies of scale and scope and thus become more efficient compared to small firms. Big

firms have more competitive power when compared to small firms in fields requiring competition. Since they have a bigger market share, big firms have the opportunity to profit more. In addition to this, big firms are able to seize the opportunity to work in the fields which require high capital rates since they have larger resources, and this situation provides them the opportunity to work in more profitable fields with little competition (Bayyurt and Duzu, 2008).

In addition, small firms may have less power than large firms; hence they may find it difficult to compete with the large firms particularly in highly competitive markets. On the other hand, as firms become larger, they might suffer from inefficiencies, leading to inferior financial performance. Theory, therefore, is equivocal on the precise relationship between size and performance (Majumdar, 1997). While different measures of firm size have been proposed, the present study used ratio of sales to total assets to measure firm size because it is simple and easily understandable (Otieno, 2013).

A review of literature on corporate financing has nonetheless postulated firm size as a key determinant of financing structure. Specifically, firm size which refers to the production and turnover capacities possessed by a firm (Surajit & Saxena, 2009); has been shown to be positively associated to corporate gearing levels. In undertaking these studies, the ratio of sales to total assets has been used to measure firm size. Researchers have attributed this relationship to the fact that lenders often perceive larger firms as less risky consumers of credit because of their superior collateral structure (Mule & Mukras, 2015).

Previously, moderating effects of firm size to leverage-performance relation is found to be ignored. Though, one can find studies investigating leverage-performance relation for SMEs without comparing with large firms. For instance Abor, (2007) studied leverage-performance rel ation for SMEs from Ghana and South Africa and found that in general debt and especially long term debts are negatively associated with firm profitability. On the contrary Jaggi & Gul, (1999) studied moderating effects of size to the relationship between investment opportunities, free cash flow and debt borrowing. Their results revealed that there was a positive relation between debt and free cash flows for low investment opportunity set firms when firm size was high. They also found that size was a significant moderator to the relation between investment opportunities, free cash flow and performance. On the other hand, Gonzalez & Gonzalez, (2012) and Voulgaris *et al.*,(2004) explored

determinants of capital structure to the contingency of firm size but did not consider it with respect to leverage-performance relation. However, this research propose that leverage-performance relation can vary within different firm size. Since, larger firms generate high and less volatile profits with strong liquidity, so their risk premium will also be lower comparatively. Similarly, information is less asymmetric in case of larger firms that also decrease their uncertainty level. Moreover, larger firms also hold high tangible assets that they can use as collateral while borrowing external debt. Consequently, these larger firms access the debt market easily at lower cost to gain tax advantages. In accordance with the trade-off theory, one can therefore anticipate positive leverage performance relation for large size firms.

2.2 Empirical Literature Review

This section reviews the empirical literature on the variables of the study.

2.2.1 Financial Leverage and Firm Performance

Financial leverage remains a major challenge in the management of most non-financial firms listed at NSE (Kenya Economic Survey, 2018). Records at the NSE reveal that in the period 2002 - 2018, leverage has oscillated from 20.84% to 77.04% (NSE Handbook, 2018). Financial leverage plays a vital role in determining the effectiveness of firms since a higher financial leverage decreases a firm's value by increasing bankruptcy risk (Sheifer and Vishny, 1997). However, (Pandey, 2010) asserts that financial leverage is like a" double - edged sword" because it can either magnify the firm's potential gains or losses.

Gill and Mathur (2011) explored the effects of financial leverage on profitability of 166 firms listed on the Toronto Stock Exchange Canada for a period of 3 years (2008 to 2010) using panel data and an Ordinary Least Square (OLS) regression model in the empirical analysis. They applied co-relational and non-experimental research design with return on assets (ROA) as a measure of firm profitability. The results portray a negative non-significant correlation between financial leverage and profitability in the Canadian manufacturing firms and is positively related to profitability of the Canadian service firms. The findings from the Canadian service industry is similar to the findings of Abor (2005) but contradicts with the findings of Majumdar and Chhibber (1999).

Berger and Bonaccorsi (2006) tested the agency theory of the capital structure on the United States banking industry using parametric measures of profit efficiency as an indicator to measure the agency costs and econometric techniques to account for reverse causality from performance to capital structure using 695 United States commercial banks for the period between 1990- 1995. The results showed that higher leverage is associated with better firm financial performance. The restrictive nature of the data therefore limits the generalization of the findings.

Amjed (2007) investigates the relationship between capital structure and the profitability of one hundred textile firms listed on the Karachi Stock Exchange of Pakistan for the period 1999 - 2004. The study used ROE as a measure of firm performance. Financial leverage was measured using short-term debt, long-term debt and total debt which was divided by total assets. By using dynamic panel data techniques, the study found positive value of coefficient of beta (0.4128) and empirically significant (t-value 4.3114) at 99% confidence level. This suggests that short-term debt tends to be less expensive, and incremental short-term debt in capital structure will therefore lead to an increase in profit levels. No significant relationship could be found between total debt and the profitability. The study focused on only one predictor variable. Besides that, return on equity is kept as a dependent variable and the leverage ratios and control variables as the independent variables. This is inconsistent with most of the studies on the relationship between financial leverage and financial performance of firms.

Majumdar and Chhibber (1999) tested the relationship between financial leverage and the financial performance of a sample of Indian companies using correlational research design. Return on net worth was used to test the relationship. The results revealed a significant negative link between financial leverage and financial performance. The study concludes that financial leverage negatively predicts a firm's performance. The study did not study listed firms and used only cross-sectional data.

Akbarian (2013) examines the effect of financial leverage and environment risk on performance of firms listed in Tehran stock exchange. By using the omission sampling method, 95 firms were selected during the years 2005 to 2011. Panel data and multiple regression were used in the study. Results indicate that firm performance which is measured by (EPS & ROA) are negatively related to capital structure. It also indicates that financial

leverage, market risk and economic risk with return of equity have a positive significant relationship. The independent variables are extremely related with ROA based on the Adjusted R-square value (66.4%). The study did not discuss the proxy for leverage in depth.

Rehman (2013) examined the relationship between financial leverage and financial performance of 20 listed public limited companies from fuel and energy sector at Karachi Stock Exchange (KSE) in Pakistan, from year 2000 to 2006 using correlation analysis. The findings of the study show a positive relationship between the financial leverage and the financial performance of the companies. Energy sector's maximum debt/equity ratio is 13.92%, with a minimum of 0.012% and sector average is 2.45%; showing 11.87% variations from mean and a standard deviation of 3.446%. Return on assets' maximum and minimum ratios of the industry is 37.3% and -4.03%, while industry average is 9.9%.Variance of 10.33 explains the variability of earning on assets investment by using industry proposed financial leverage structure. ROE of this sector is quite high of 83.55% as maximum, while average of 2.3%, variability is 25.25% much greater when earning on equity trades off for financing decision of by using leverage or equity financing. Dividend ratio to equity Industry average is 9.7%, while highest is 27%, standard deviation is 7.5 which is comparatively lesser than other performance indicators. The researchers concluded that employment of debt in the capital structure of the companies may make a positive impact on the performance. In order to maximize the return on investment, leverage may be used as "the variable" while making considerations to improve at financial health of the companies by raising their financial performance. In this study, the use of cross sectional data did not allow for the control of the unobserved firm effects as the study only focused on one sector.

Ojo (2012) investigated the effect of financial leverage on financial performance for three pharmaceutical companies quoted in Nigeria over a period of twelve years (2001 - 2012). This study employed ex-post facto research design and Least Squares (OLS) method for analysis of hypotheses stated in a multiple form. Results indicate that, coefficient of multiple determinations (R^2) is 23.5% of the variations in the dependent variable are explained by the independent variables while 77.5% of the variations are affected by other factors outside the model. That debt ratio (DR) bears a negative relationship with the Return on Assets (ROA) at -0.280 but insignificant at 0.781 and it is not an important determinant of financial performance of Nigeria pharmaceutical companies. Based on the above findings, the researchers recommended that companies' management should ensure that financial decisions

made by them are in consonance with the shareholders' wealth maximization objectives which encompasses the profit maximization objective of the firm. The amount of debt finance in the financial mix of the firm should be at the optimal level so as to ensure adequate utilization of the firms' assets. The study focused on only one sector and therefore the results of the study may not be generalized to other sectors. Besides that, the study focuses on a single accounting measure of performance and fails to test the combined synergetic effect of accounting measures and market based measures of performance of listed firms.

Abor (2005) tested the relationship between operational leverage and the financial performance of listed firms in Ghana using time series data and correlation analysis. He finds a positive relationship between short term debt and total assets and return on equity due to low interest rates prevailing in Ghanaian economy. Short term financing represented 85% of total debt in Ghanaian firms and was a major component of financing for them. The relationship between total debt and performance is due to the larger proportion of short term financing in total debt. The study concludes that profitable firms are largely dependent on debt as a major source of financing.

Enekwe et al., (2014) examined the effects financial leverage on financial performance of the Nigerian pharmaceutical companies over a period of twelve years (2001- 2012) for three selected pharmaceutical companies' quoted on the Nigerian Stock Exchange (NSE). The study employed Debt ratio (DR); Debt-equity ratio (DER) and Interest coverage ratio (ICR) as independent variables in determining their effect on financial performance for Return on Assets (ROA) as dependent variable. The ex-post facto research design was used for this study. Descriptive statistics, Pearson correlation and OLS regressions were used in analyzing the data. The results of the analysis showed that Debt ratio (DR) and Debt-equity ratio (DER) have negative relationship with Return on Assets (ROA) while Interest coverage ratio (ICR) has a positive relationship with Return on Assets (ROA) in Nigeria pharmaceutical industry. The analysis also revealed that all the independent variables had no significant effect on financial performance of the sampled companies. The study recommend that companies' management should ensure that financial decisions made by them are in consonance with the shareholders' wealth maximization objectives which encompasses the profit maximization objective of the firm. The study further suggested that only 16.4% of the variations on the dependent variable are caused by the independent variables in their model suggesting that 83.6% of the variations in financial performance are caused by other factors

outside the model. The study employed a small sample which was limited to pharmaceutical companies and therefore the results are not robust.

Onaolapo and Kajola (2010) investigated the effect of capital structure on firm's financial performance using sample of thirty non- financial firms in fifteen industry sectors listed on the Nigerian Stock Exchange during the seven- year period, 2001- 2007. The study used ROE and ROA as measures of firm performance. Financial leverage was measured using debt equity ratio. Panel data for the selected firms are generated and analyzed using Ordinary Least Squares (OLS) as a method of estimation. The results show that a firm's capital structure surrogated by Debt Ratio, has a significantly negative impact on the firm's financial measures (Return on Asset and Return on Equity) of sampled firms. The findings are consistent with the findings of Mule and Mukras (2015). However, the study did not consider the cross sectional aspects of the data.

Maina and Ismail (2014) evaluated the relationship between leverage and the financial performance of listed firms in Kenya, for the period 2002 - 2011. Data was analyzed using descriptive, regression and correlation. Tobin's Q was used as proxy for firm value while ROE and ROA were used as proxies for financial performance. Debt to equity, debt to assets and long term debt to equity were used as proxies for leverage. The results revealed a significantly negative relationship between debt and profitability but no effect on firm value. While they validate MM (1958) irrelevance theory through Tobin's Q, they negate the same since debt had a negative relationship with profitability, implying that ultimately, it affects the firm value somehow since a firm value is sum of its debt and equity(which includes retained profits). This study used all listed firms at the NSE including the financial sector firms whose liquidity and leverages are highly regulated.

Mule and Mukras (2015) examined the relationship between financial leverage and financial performance of 47 firms listed in the Nairobi Securities Exchange Kenya using annual data for the period between 2007 and 2011. The study used ROE, ROA and Tobin's Q as measures of firm performance. Using various panel data procedures, the researchers found that the relationship between financial leverage and financial performance depended on the measure of performance used. The study found reasonably strong evidence that financial leverage significantly and negatively affects the performance as measured in terms of Tobin's Q and ROA. However, the study also found a negative and insignificant effect of financial leverage

on performance as measured by ROE. Therefore, the study concluded that financial leverage is an important negative predictor of financial performance measured in terms of ROA and Tobin's Q. The study, however, did not consider other financing decisions in the analysis, including the mediating effect of internal cash flow available. Unlike Maina and Ismail (2014), who found a significant negative relationship between debt and profitability but no effect on firm value, the study invalidated Modigliani and Miller, (1958) irrelevance theory through Tobin's Q.

Nyatete et al., (2018) analyzed the effect of financial leverage on value-added financial performance for listed firms. The study used VAIC as a measure of firm performance. Correlational research design was employed with target population of 64 firms. Purposive sampling technique obtained 456 firm-year observations from 2003 to 2014 for 38 firms. Secondary data collected was analyzed using fixed effects multiple regression. Results show that financial leverage has a negative significant effect on value-added performance implying a unit increase in financial leverage leads to 45.02% reduction in value-added financial performance. This study used all firms listed at the NSE including the financial sector firms whose liquidity and leverages are highly regulated and used a single set of performance measure. Therefore, the nature of the data limits the generalization of the findings.

From the above studies, it is evident that the results of empirical literature on the relationship between financial leverage and performance are contradictory which justifies further research. The studies (Onaolapo and Kajola, 2010; Ojo, 2012; Maina and Ismail, 2014; Enekwe et al., 2014; Mule and Mukras, 2015) provide insights into the relationship between financial leverage and firm performance. These studies used convenient sampling, time series data, ex-post facto research design, Least Squares (OLS) and individual measures of performance in their studies. Mule and Mukras (2015), Maina and Ismail (2014) uses various panel data procedures, descriptive, regression, correlation and either separate or single measures of performance to study all listed firms at NSE and found negative relationships between leverage and performance. In contrast to the above view, some studies have found positive relationships between leverage and performance, (Gill & Mathur, 2011; Abor, 2005; Rehman, 2013; Berger & Bonaccorsi Di Patti, 2006; Akbarian, 2013; Amjed, 2007). Gill & Mathur (2011) and Abor (2005) applied co-relational analysis, time series data, cross-sectional data separately, dynamic panel data techniques, omission sampling method, multiple regression and parametric measures but concentrates on single measures of

performance.

Most of the reported studies on the relationship between financial leverage and firm performance have used convenient sampling in their studies indicating that the results were cautiously interpreted. Besides that, majority of the reviewed studies have been conducted in developed countries where capital markets are well-developed with fewer studies from developing countries like Kenya where capital market is relatively under developed and therefore, the traditional capital structure theories that have their origin in the developed countries need to be tested in the Kenyan context. While previous studies conducted in Kenya have attempted to link financial leverage and financial performance, the studies focused on all listed firms and included financial sector firms whose liquidity and leverages are highly regulated by the central bank. Moreover, they employed either individual accounting measures or market based measures. From the literature reviewed, no known study has been conducted to establish the effect of financial leverage on financial performance of non-financial firms listed in the NSE using ROE, Tobin's Q and panel methodology which facilitates identification effects that cannot be detected using purely cross-sectional or time series.

2.2.2 Firm Size and Firm Performance

Studies on the effect of firm size on firm performance have generated mixed results ranging from those supporting a positive relationship among these variables to those opposing it. Further, under the same sample of the firms, this relationship may be positive over some firm size ranges and negative for others.

Becker et al., (2010) examined the effects of firm size on profitability in 109 firms operating in manufacturing sector in USA using the data of years 1987 to 2002. The study used earnings before interest and taxes (EBIT) and earnings before interest, taxes, depreciation and amortization (EBITDA) as return on investment measures of the firms while log of number of employees was used as the basic measure of firm size. Regression method was used in the empirical analysis and results of the study showed that negative and statistically significant relations existed between the total assets, total sales and number of employees of the firms and their profitability. The study did not use panel methodology in analyzing the relationship between firm size and performance.

Lee (2009) examined the role played by firm size on profitability of 7,158 US publicly-held corporations listed in US stock exchanges over the 20-year period between 1987 and 2006. The researcher used fixed-effects dynamic panel data model in their analysis. The absolute firm size was measured as the log value of assets (LSIZE), firm market share (SHARE), capital intensity (CAP), advertising intensity (ADV), R&D intensity (R&D), sales growth (GROWTH), stock volatility (BETA), debt to sales ratio (DEBT), and the inventory to sales ratio and the particular measure of profitability was defined as 100 x (net income + advertising expenses)/total assets. This definition is used to resolve the bias of estimating a model in which some explanatory variables, such as advertising expenses, are also part of the composite dependent variable. The study found that profit rates are positively correlated with firm size in a non-linear manner, holding an array of firm- and industry-specific characteristics constant. This study covered listed firms in USA with high profits, good market capitalization and have high debt repayment capacities that are different from those of Kenya.

Amato and Burson (2007) examined the relationship between Size and profitability among firms operating in the financial services sector in USA. They tested both linear and cubic form of the relationship. With the linear specification in firm size, the study found a negative influence of firm size on profitability. Even though this influence was not statistically significant, there was evidence of a cubic relationship being detected between return on assets and firm size. Again, this study failed to look at the combined effect of accounting based measures on performance and market based measures before deriving the conclusion.

Akbas and Karaduman (2012) observed the consequence of firm size on the profitability of manufacturing companies listed on the Istanbul Stock Exchange in Turkey. Panel data has been used from the period of 2005 to 2011. Profitability was calculated using Return on Assets, whereas as the alternatives of firm size were utilized by both total assets and total sales. According to the outcomes of the research, firm size had an affirmative contact on the profitability of manufacturing companies of Turkey. This study did not examine the combined effect of accounting based measures and instead used a single measure of performance before deriving the conclusion.

Jonsson (2007) investigated the relationship between profitability and size of the firms operating in fish and fish processing industry, banks and civil engineering consulting firms in

Iceland. In this study, data of two hundred and fifty firms were analyzed over five year period between the years 2000 to 2004. The study used return on equity (ROE), return on capital invested (ROC) and return on assets (ROA) as measures of firm profitability. Regression method has been used in the empirical analysis. Results of the analysis showed that there was a negative relationship between firm size, measured as turnover, and profitability measured as ROA, for all the years studied. R2 (less than 0.1%) suggests that this relationship was very weak and not statistically significant, therefore, the analysis shows that size has no statistically significant effect on profitability irrespective of how profitability or size is measured. The study did not use panel methodology in analyzing the relationship between firm size and performance.

Vijayakumar and Tamizhselvan (2010) studied the relationship between firm size and performance in South India using a sample of 15 companies. Their study was based on a simple semi-logarithmic specification of the model. They used sales and total assets as measures of firm size and profit margin and profit on total assets as proxies of firm performance. Their findings revealed that there was a positive relationship between firm size and firm performance. The study employed a small sample of firms and therefore, the results are not robust.

Pervan and Višić (2012) examined the relationship between firm size and business success in medium size and large enterprises in Croatia during the year 2002 to 2010. The study employed regression analysis. The sample comprised 2,050 firms per year, yielding a total of 18,492 observations for the period under consideration. In order to test the relationship between firm size and profitability in Croatian manufacturing industry, several different measures of firm's financial performance and firm size were employed. Financial performance measures used included return on assets, return on equity, profit margin, earnings before interest and tax, tax, depreciation and amortization. Meanwhile, firm size was measured by natural logarithms of firm assets and natural logarithms of number of employees. The results of the regression analysis conducted showed that firm size has a weak positive impact on firm profitability. However, the study did not test the effect of level of firm size on performance using a panel methodology.

Salawu, et al., (2012) measured the basis of financial policy and firm specific characteristics i.e.: firm size on corporate performance. Panel data of 70 firms in Nigeria was used in this

study for the period 1990 to 2006. Pooled OLS, Fixed Effect Model and Generalized Method of Moment panel model were employed in the estimation and data were sourced from the annual report and financial statement of the sampled firms. ROA was used as performance measurement. The estimation of the dynamic panel-data results show that long-term debts, tangibility, corporate tax rate, dividend policy, financial and stock market development were all positively related with firms' performance. Furthermore, the positive relationship between stock market development and ROA suggest that, as stock market develops, various investment opportunities are opened to firms. Therefore, there is need to monitor the performance of these variables in order to stabilize and enhance performance of listed firms in Nigeria. In addition, the result shows that growth, size and foreign direct investment are negatively related with a firms' performance (ROA). In addition, the result indicates that higher income variability increases the risk that a firm may not be able to cover its interest payment, leading to higher expected costs of financial distress. This may lead to reduced profitability. This study used a single accounting measure of performance instead of multiple measures of performance.

John and Adebayo (2013) examined the effect of firm size on the profitability of manufacturing firms listed in the Nigerian Stock Exchange. Panel data set over the period of 2005-2012 was obtained from the audited annual reports of a sample comprising five (5) randomly selected beverages manufacturing companies per year, yielding a total of forty (40) observations for the period under consideration. Return on assets (ROA) was used as a proxy for profitability while log of total assets and log of turnover were used as proxies for firm size. Furthermore, liquidity, leverage and the ratio of inventories to total assets were used as the control variables. The analysis was carried out using Pearson Product Moment Correlation co-efficient and regression. The results of the study revealed that size both in terms of total assets and total sales, leverage and liquidity are positively correlated with ROA, while inventory is negatively correlated. According to this result, firm size has a positive impact on the profitability of Nigerian manufacturing companies that are listed in the Nigerian Stock Exchange market. The study used only a single accounting measure of performance but did not consider market based measures of performance. Besides that, the study employed a small sample of firms and focused only on one sector.

Mehrjardi (2012) studied the relationship between size and profitability of banks in Kenya. Data of 43 licensed Banks in Kenya for the period 2008 -2010 were used in the study. Return

on assets was used as proxy for profitability whereas customer base, number of branches, deposit liabilities and market share were the independent variables. The study found that there was a strong positive relationship between profitability of banks and customer base, number of branches, deposit, liabilities and market share. However, the study focused on a single accounting measure of performance but did not test the combined synergetic effect of accounting measures and market based measures of performance of listed firms.

Bisher (2011) assessed the link between firm size and financial performance of commercial banks in Kenya. The researcher used a descriptive research design to establish the correlation between the variables. Secondary data was utilized for a period of five years; this data was obtained from financial statements and records. The findings revealed that size had a positive correlation with financial performance. Morever, total deposits were found to have a positive effect on financial performance. On the contrary, there was no link between bank branches and financial performance. The study did not consider listed firms and did not test the effect of level of firm size on performance using a panel methodology.

Kaguri (2013) conducted a study on the relationship between firm characteristics and financial performance of life insurance companies in Kenya. He employed regression to establish the relationship between firm size and performance with data of 17 life insurance companies in Kenya for the period 2008 - 2012. Return on asset was used as a dependent variable whereas size, diversification, leverage, liquidity, age, premium growth and claim experience were the independent variables. The Study concluded that there was a positive relationship between the size of premium and profitability of an insurance company. The study did not consider listed firms and used a single measure of performance instead of multiple measures of performance.

Mule et al., (2015) explored the effect of corporate size on profitability and market value of listed firms in Kenya. In this study, data for companies that were active in the Nairobi Securities Exchange (NSE) between the years 2010 to 2014 have been used. Panel correlation and multiple regression methods were used in the empirical estimations. Results indicated that there was a positive significant relationship between firm size and profitability, that is, return on equity ($\beta = .012$, $t = 2.585$) implying that value that a unit change in firm size leads to an increase in return on equity of firms listed at the Nairobi Securities Exchange of 0.012, all things being fixed whereas firm size

insignificantly positively predicts profitability, that is, return on statistically significant impact on firm market value (β = -.011, t = -.225) under random effects specification.

The studies reviewed, indicate that mixed results have been found present. Amato and Burson (2007); Lee (2009); Vijayakumar and Tamizhselvan (2010); Akbas and Karaduman (2012); Pervan and Višić (2012); John and Adebayo (2013); Mehrjardi (2012); Bisher (2011) and Kaguri (2013) have found a positive relation between firm size and profitability using ordinary least square regression, multiple regression model, multivariate statistical method, multi ratio model and either separate or single measures of performance to study the relationship between firm size and financial performance. On the contrary, Becker et al. (2010), Jonsson (2007), Salawu, et al., (2012) have found a negative relation between firm size and profitability using accounting based measures of performance, Pooled OLS, Generalized Method of Moment panel model, fixed effect dynamic panel data model, regression model and correlation analysis.

From the review, it is noted that majority of the studies were mainly drawn from the developed nations with fewer studies from developing countries like Kenya. Further, majority of the studies reviewed used either time series or cross sectional data separately. However, the use of panel methodology which facilitates identification effects that cannot be detected using purely cross -sectional or time series was ignored. Besides that, the studies reviewed focused on either single accounting measures or market based measures of performance but did not test the combined synergetic effect of accounting measures and market based measures of performance of listed firms. However, a study by Mule et al., (2015) found mixed results using different measures of performance which implies that performance depends on the measure used. The aforesaid study differs from the present study in terms of the number of the companies used and nature of the firms, for instance, Mule et al., (2015) studied all listed firms including financial firms that are highly regulated by the central banks and the variables used are different. Therefore, no known studies have attempted to determine the influence of firm size on financial performance of non-financial firms listed in the NSE using ROE and Tobin's Q as measures of financial performance and panel methodology.

2.2.3 Firm Size, Financial Leverage and Firm Performance

Previously, most of the studies explored direct leverage-performance relation while few articles considered moderating factors in this context. It is argued that study of direct leverage and performance relation is not useful as it depends on various contingencies and moderating factors (Farooq et al., 2014). For this reason, the intensity and even direction of financial leverage and financial performance relation can change because of these contingency factors.

Studies by Gonzalez & Gonzalez (2012) on the moderating effects in financial structure determinants using dynamic panel data tests on a sample of 3439 Spanish firms over the period 1995–2003, the study suggests the validity of the Signaling theory to explain financing decisions varying among small, medium-sized and large firms. The results from the study are partially consistent with both explanations but suggest a greater validity of pecking-order predictions for small firms. In small firms, the negative influence of profitability and the positive influence of investment opportunities and of intangible assets on firm debt predicted by the POT are heightened. However, no differences are observed between small and large firms in their speed of adjustment to the target leverage as suggested by the TOT. Since the research was done in developed economies, it may not be very useful to a developing economy such as Kenya.

La Rocca (2007) also find that corporate governance is one of the important moderators to the leverage and performance relation. He did research on the influence of corporate governance on the relation between capital structure and value with a descriptive model in Italy. This thread of research confirms that if investment policies allow for value creation, financing policies, together with other governance instruments, can assure that investment policies are carried out efficiently while firm value is protected from opportunistic behavior. It is necessary to consider the presence of complementarity between capital structure and other corporate governance variables such as: ownership concentration; managerial ownership; the role of the board of directors; and so on.

Xayphone and Kimbara (2007) investigated the moderating effects of ownership types and management styles to corporate financing on the performance of SMEs in Vientiane Capital City, Lao PDR. Hierarchical moderated regression analyses was on data of 160 trading SMEs over the period 2002-2004. The results indicated that both debt and equity have

statistically significant and positive impacts on profitability when considering the moderating effects of ownership types and management styles. The moderated multiple regression results of the relationship between retained earnings, ownership types and management styles on the performance indicates that there are significant and positive effects for retained earnings and the control variable: LOGFA ($p<0.001$). The results also indicate that the insertion of interaction terms improves the amount of variance of explanatory power in performance significantly (Adjusted R increases from 9 percent to 40 percent). More specifically, there is a significant interaction between retained earnings and both ownership types and management styles ($p<0.05$ and $p<0.001$, respectively). The positive sign portrays that family-owned SMEs and owner-managed firms moderate the relationship between retained earnings and performance. The results also confirmed that there are significant and positive effects on debt equity and LOGFA ($p<0.001$). The positive sign portrays that both family-owned business and owner-managed firm are moderators to strengthen the relationship between debt to equity ratio and performance of trading SMEs in the study. This study concentrated on small and medium enterprises as opposed to listed firms and panel methodology is not employed to actualize the study objectives.

Gleason et al., (2000) studied the influence of culture on leverage-performance relation for 198 European Community retailers in 14 European countries, which were grouped into four cultural clusters. Data for 198 European Community retailers were obtained. Regression analysis was used in the study and it found that culture is an important moderator to the leverage-performance relation. The results also suggest that agency conflicts may be primarily responsible for overleveraging of retailers, resulting in a negative relationship between capital structure and performance. However, the focus of the study was community retailers in 14 European countries as opposed to listed firms.

Chao (2012) studied the influence of capital structure on organizational performance at Taiwan-listed info-electronics companies, with corporate governance being the moderator. Hierarchical regression with convenience sampling was used to yield knowledge from the population, the linear Structural Equation Modeling (SEM) was adopted to verify the goodness-of-fit effects among the overall model, structural model and measurement model. Findings reveal that sound capital structure and satisfying corporate governance at Taiwan-listed info-electronics companies both exert a significant interactive influence on the organizational performance. In other words, the "corporate governance" variable in this

study has a positive extraneous effect. This study adopted the non-probability, convenience sampling method for convenience purposes, with samples selected only on the "proximity" and "easy-to-measure" bases. However, that resulted in a substantial sampling bias and a reduced reliability having ignored simple random sampling or stratified random sampling instead.

Yung-Chieh (2013) studied innovation strategy as moderating factor to the leverage and performance relation in Taiwan listed photovoltaic companies. The study tested the goodness-of-fit effects of the overall model, structural model, and measurement model using Structural Equation Modeling (SEM) and identified a significantly positive extraneous or interactive effect of corporate innovation activities on the relationship between capital structure and corporate performance of Taiwan-listed photovoltaic companies. The author adopted SEM for modeling in order to explore how unobservable variables connect to one another in the Structural Model, whether the measurement model has measurement reliability, and how the overall model's goodness- of-fit effect is. In this study, the overall model had a satisfactory goodness- of-fit effect because $x^2/d.f < 5$ and the values of GFl, AGF1 and NFl all exceeded 0.90, with a below -0.05 RMR. To test the extraneous variable, this study's author performed a hierarchical regression analysis, followed by centralized regression analyses and t-tests of Y versus X, Mo and X*Mo in order to examine whether the hypothesis about a significant regression coefficient c is substantiated (i.e. whether c is zero or not). The test results indicate 0.683 Path Coefficient of Mo*X versus Y suggests an extraneous effect of Mo*X on Y. The following results were derived from the analyses. A sound capital structure affects corporate performance in a significantly positive way, with a 0.741 standardized path coefficient; Corporate innovation activities affect corporate performance in a significantly positive way, with a 0.762 standardized path coefficient; A sound capital structure and corporate innovation activities exert an interactive effect on corporate performance in a significantly positive way, with a 0.813 standardized path coefficient. This research focused only on one sector and did not employ panel methodology to test performance.

Farooq et al., (2014) studied firm's strategy and market competition as moderator to the leverage-performance relation. Data was collected from 125 Pakistani textile firms listed at Karachi Stock Exchange (KSE) for the period of 2006 to 2011 from "financial   statements analysis of companies (non-financial firms) listed at Karachi Stock Exchange'. Generalized

linear model (GLM) regression analysis was employed. The data consisted of unbalanced panel data with 712 numbers of observations. The findings revealed that debt ratio, short term debt ratio and long term debt ratio were all are negatively associated with profitability. It was also established that unit increase in short term debt ratio increases the profits by 3.5% in cost leadership strategy as compared to product differentiation strategy. It was also established that unit increase in short term debt ratio increases the profits by 3.5% in cost leadership strategy as compared to product differentiation strategy. This implies that current liabilities are also more profitable in comparison with firms that follow cost leadership strategy. Long term debt ratio was also found to be significantly negatively related with profitability too. The results showed that with the unit increase in debt ratio, firm's profit decrease by 16.3% on average. However, cross effect of long term debt with strategy showed significant positive beta of 0.10. This indicates that long term debts are more profitable in cost leadership strategy as compared to product differentiation strategy. However, one cannot conclude about overall effects of short term debt ratio in case of cost leadership as short term debt ratio showed insignificant results. Besides that, the study focused only on one sector of the economy.

Abbasi and Malik (2015) investigated the moderating effect of firm size in the relationship of firm growth and firm financial performance. For this purpose, 50 non-financial firms from different sectors were targeted to get data for year 2012. The data was collected from the financial statements of companies listed in Karachi Stock Exchange for the year 2012. Before application of the regression analysis, the unit root test, variance inflation factor (VIF) were applied to check the stationary of the data and to resolve the problem of multi-co-linearity if exist. For this purpose, the secondary cross- sectional data was gathered from 50 firms listed in Karachi Stock Exchange. The results of regression analysis demonstrated that the alternative hypothesis of the research that firm size has moderating inspiration between independent variable (firm growth) and dependent variable (Firm performance) is accepted. The study is cooperative for the management to keep an eye on firm size along with firm growth while enhancing the firm performance.

Vithessonthi and Tongurai (2015) conducted studies in Thailand to examine whether firm size affects the relationship between leverage and operating performance during the global financial crisis of 2007–2009 using panel regression on all registered firms. From a data set of 496,430 firm-year observations of a sample of 170,013 mostly private firms, the

researchers found that the magnitude of the effect of leverage on operating performance is non-monotonic and conditional on firm size. While panel regression results indicate that leverage has a negative effect on performance across firm size subsamples, the year-by-year cross-sectional regression results show that the effect of leverage on performance is positive for small firms and is negative for large firms. The findings show that about 75% of Thailand firms in the study appear to have managed to withstand the global financial crisis on the basis that they do not have to simultaneously deleverage and liquidate their assets. However, the study focus is all Thailand registered firms as opposed to listed firms.

Muigai, (2017) investigated the moderating effect of firm size on the relationship between capital structure and financial distress of listed non-financial firms in Kenya. Firm size was measured using the natural logarithm of total assets while capital structure was operationalized by total debt, long-term debt and short term debt financing. The degree of financial distress was measured using the Altman's Z-score index as reviewed for the emerging markets. Secondary data from audited and published financial statements was collected on the 40 listed non-financial firms between year 2006 and 2015. The study estimated the specified panel regression model for fixed effects. Feasible Generalized Least Squares (FGLS) regression results revealed that firm size has a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. Specifically, the study found that, although debt generally has a negative and significant effect on financial distress of the companies studied, this effect becomes positive and significant as the size of the firm increases. The study further found that use of long term debt had a positive and significant effect among large- scale firms while short term debt was significantly detrimental.

The review of literature on the moderating role of firm size indicates that scanty research has been done on this variable. Gonzalez & Gonzalez (2012); Vithessonthi and Tongurai (2015); La Rocca (2007); Gleason et al., (2000); Abbasi and Malik (2015); Chao (2012); Yung-Chieh (2013); Xayphone and Kimbara (2007); found positive impacts on the relationships using dynamic panel data tests, panel regression, descriptive model, regression analysis, hierarchical regression with convenience sampling and linear Structural Equation Modeling (SEM), cross –sectional data, Hierarchical moderated regression analyses and Generalized linear model (GLM) regression analysis. Some studies reviewed focused on either community retailers or on all registered firms, while the rest focused only

on one sector, small and medium enterprises as opposed to listed firms. Besides that, they used single accounting based measures of performance. On the contrary, Farooq et al., (2014) applied linear model (GLM) regression analysis with unbalanced panel data and found a negative impact on the relationship focusing on only one sector.

In Kenya, Muigai, (2017) investigated the moderating effect of firm size on the relationship between capital structure and financial distress of 40 non-financial firms listed in the NSE between 2006 and 2015. Results revealed that firm size had a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. Firm size was measured using the natural logarithm of total assets, however the current study used ratio of sales to total assets to measure firm size as a moderating variable between financial leverage and financial performance of non-financial firms listed at the Nairobi Securities Exchange.

From the existing literature, the moderating effects in financial structure determinants, were measured using dummies, subsamples or simple interaction terms in tabulated form, single accounting based measures of performance and failed to test the effect of both accounting based and market based measures of performance of listed non-financial firms. It is also noted that majority of the studies were mainly drawn from the developed nations where capital markets are well-developed with fewer studies from developing countries where, capital market is relatively under developed. Literature on the moderating effect of firm size on financial leverage-performance of non-financial firms listed in the NSE is unknown. Besides that, no known study has integrated the three variables: financial leverage, firm size and financial performance using panel methodology with ROE and Tobins'Q as proxies of performance in a single research for listed non-financial firms in a frontier market like the Nairobi Securities Exchange. The current study thus assessed the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE.

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter describes the research methodology of the study that were used to address the research problem and actualize the objectives of this study. These include research paradigm, research design, study area, population of study, sampling frame, type of data, data collection procedures, and reliability and validity tests, data analysis and data presentation tools used in the study.

3.1 Research Design

Research design refers to how data collection and analysis are structured in order to meet the research objectives (Chandran, 2004). According to Cooper & Schindler (2007), research design is the plan and structure of investigation of a phenomenon so conceived as to obtain answers to study objectives. The plan entailed the overall scheme or programme to be conducted during research. It included an outline of what the investigator does from writing hypotheses and their operational implications to the final analysis of data. The purpose of the present study focused on the empirical analysis of firm size, financial leverage and financial performance of non-financial firms listed in the NSE, Kenya.

The first step in conducting a research is selecting the research paradigm (Robson & McCartan, 2016), which encompasses both theories and methods to be used in the study. Creswell (2014) argue that there are two main paradigms that are applicable in research namely; quantitative and qualitative. The quantitative paradigm is termed as the traditional and positivist while, the qualitative research is considered constructivist and experimental. The present research used quantitative paradigm and since the cause and effect relationship between quantitative variables was sought, a correlational research design was adapted. This research design is used to relate two or more variables and allow predictions of outcomes based on causative relationships between the variables (El-Sayed Ebaid, 2009). According to Sekaran (2000), a correlational research design is applicable in studies where important quantitative variables associated with the problems are to be delineated.

A study design is the plan of action that the researcher utilizes for answering the research questions. Positivism research philosophy was adopted. Positivism Paradigm adheres to the view that only factual knowledge gained through observation including measurement is trustworthy. In positivism studies, the research is associated with data collection and

interpretation through objective approach and the research findings are usually observable and quantifiable. Trochim, (2006) indicates that research design provides the glue that holds the research project together. A design is used to structure the research, to show how all of the major parts of the research project the samples or groups, measures, treatments or programs, and methods of assignment work together to try to address the central research questions (Trochim, 2006). Based on the positivist approach, the study adopted correlational survey research design. Mugenda and Mugenda (2005) notes that

correlational research design involves collecting data in order to determine whether and to what degree a relationship exists between two or more quantifiable variables.

3.2 Study Area

The study was carried out in the Nairobi Securities Exchange (NSE) in Nairobi City, the capital city of Kenya. Nairobi city lies on longitude 1^0 17' South and 35^0 49' East covering an area of 684 km^2 with a population of 3.96 million in 2018, (NSE, 2018). It is a commercial and industrial hub. Nairobi is the second largest city by population in East African region after Dar es salaam, Tanzania. The city also happens to be a home of thousands of Kenyan and foreign businesses.

The Nairobi Securities Exchange (NSE) which is located in Nairobi, where sixty five (60) firms are listed happens to be the single major open capital market in the country. The Nairobi Securities Exchange (NSE) is a market that deals in exchange of securities by the publicly quoted firms. The securities market has developed over the years with 60 firms being listed by the close of 2018 (NSE, 2018). It has also automated its trading system to improve its efficiency. Therefore, the study was restricted to non-financial firms which are listed at the NSE. All information required for this study was therefore easily available hence the preferred area of study. The list of non-financial firms and the study area map are appended as Appendix 3 and 4 respectively.

3.3 Target Population of study

Frankfort-Nachmias et al., (2008) define a population as all cases of individuals or things or elements that fit a researcher's specification. The population of the study comprised all non-financial firms listed at NSE Kenya from 2012 to 2018. The Non-financial firms listed at the NSE were targeted because of the availability of financial and non-financial information published annually as required by the companies Act and Capital Markets Authority.

However, the financial firms were excluded from the study because they are highly regulated by Central Bank of Kenya and other regulatory bodies. Therefore, their leverages are highly regulated. As observed by Mwangi et al., (2014), this heterogeneity makes it difficult to conduct hypothesis testing for the study. As at June 2018, there were forty seven (47) non-financial firms listed at the NSE (NSE Handbook, 2018).

The time frame considered for this study envisages to capture period before 2013 General Elections and political uncertainty. Besides that, it also captured the period within which the revision of corporate governance rules with guidelines issued in 2002 by Capital Markets Authority (CMA) were revised (in 2010) and enforced after 2012. This was also intended to see the effect of policy stance of the new constitution of 2010. It marked the beginning of the recovery of the economy as clearly reflected by the improved performance of the NSE. For instance, market capitalization rose by 40% in 2013, exceeding the Kshs 1 trillion, with average annual return of 36% based on the NSE 20 Share Index. Finally, in 2018 the Capital Market declined as a result of fiscal policies around the proposed Robin Hood Tax that impacted negatively on the appetite of both local and foreign. Other factors include US Market Bull run and the revived US economy causing foreigners to favour developed markets. Besides the political stability in the country following the March 9th 2018 famous "Hand shake'' after the 2017 heated General Election. This brought optimism that 2018 would bring more success to the Exchange. Medium term GDP growth grew by 5.8% and it was projected to grow to 6.1% in 2019 on account of reduced political risk and improved weather conditions. The Exchange was also slated to launch its Derivatives Market in order to grow its product portfolio. The period therefore, acts as a pointer to the lessons learnt from the intrigues of financial leverage in the 2017 General Election (NSE, 2018). The study area map is appended as Appendix 4.

3.4 Sampling Size and Techniques

The study targeted non-financial firms listed in the NSE where 28 firms out of a total of 47 non- financial firms were purposively sampled for use in the study. Out of 47 firms, 10 firms were delisted while 9 firms were listed after the base year 2012 as shown in appendix 3. This method was preferred in this instance because Kathuri & Pals (1993) and Kothari (2004) state that when a researcher is interested in a specific information, only respondents with such characteristics should be selected. The method was considered suitable since it allowed a longer longitudinal and broader cross-sectional market wide study using balanced data.

Mugenda & Mugenda (2005) reinforces this position by adding that purposive sampling is necessary where a sample shows good evidence of providing the researcher with the necessary information. In this study therefore, the researcher collected data from annual financial reports of 28 firms with complete data for the period January 2012 to December 2018 with 196 firm year observations as indicated in appendix 3. This is consistent with Lai (2010) who asserted that at least 20 firms in any sector in a year are adequate to provide sufficient observations for estimation purposes.

3.5 Data Collection Methods

The study used secondary data since the nature of the data is quantitative. Data collection entails gathering empirical evidence in order to gain new insights about a situation and answer questions that prompt undertaking of the research (Kothari, 2004). Secondary data was extracted from published and audited annual reports deposited with the CMA as required by law and the NSE publications on financial reports of different non-financial firms using data collection sheet. Such data was used because the companies listed at the NSE have clear international standards of statements of account i.e. financial position and income statements are prepared according to International Accounting Standards (IAS). This therefore makes them a credible source of data to be used in the study.

3.6 Stationarity Test

Data was subjected to unit root test to establish its stationarity conditions. Gujarati (2007) asserts that stationarity conditions are conducted to avoid change of estimates over time in the study variables which would in turn lead to spurious estimates. To establish the stationarity conditions of the data series in this study, unit root test using Levin-Lin-Chu unit root test was conducted. The findings revealed a unit test for financial leverage; Adjusted $t*$= -14.572, p= 0.000, Firm size = -84.049, Tobin's Q= -7.682, p= 0.000, and ROE Adjusted $t*$ =-14.693, p=0.000 implying that all the panels contained unit root therefore, we reject the null hypothesis and conclude that the time series is stationary.

Table 3.1: Summary of ADF Panel Unit Root Test Results on Study Variables

Series	ADF Statistics Critical Value =-2.868, p= 0.05	Probability (1%)	Conclusion (At levels)
Financial Leverage	-14.572	0.000	stationary
Firm Size	-84.049	0.000	stationary
Return on Equity	-14.693	0.000	stationary
Tobin's Q	-7.682	0.000	stationary
Asset Tangibility	-38.559	0.000	stationary
Age of the firm	-11.643	0.000	stationary

Source: Field Data, 2019

3.7 Diagnostics of Regression Model

3.7.1 Assumptions of Panel Regression

Before regressing data for analysis purposes, data was checked to avoid violation of the assumptions of panel regression model as asserted by Hair et al., (2010). This is to ensure that the data yields best least squares unbiased estimators. According to Field (2000), the common tests that should be conducted include types of variables, normality, homoscedasticity, multicollinearity and autocorrelation.

3.7.1.1 Types of Variables

As recommended by Field (2005), all predictor variables must be quantitative or categorical and the outcome variable must be quantitative, continuous or unbound. In this study, both the predictor variables and the outcome variable, performance were quantitative. This means that the type of variables did not violate the requirements of regression analysis in this regard.

Cole and Mehran (1998) observes that it is necessary to choose measures of performance that are quantifiable, expressive and comparable. Market-based indicators seek to predict future situations and are mostly driven by factors that cannot be controlled by the firm's managers while accounting-based measurements demonstrate a firm's current situation, and are mostly driven by factors that can be controlled by the firm.

3.7.1.2 Financial Performance

In financial economics, a firm's performance is measured through profit margin, return on assets (ROA), return on equity (ROE), return on sales (ROS) and Tobin's Q (Annavarjula and Beldona, 2000).

To measure a firm's performance, many management researchers prefer accounting- based variables namely ROE, ROA and ROS. The idea behind these measures is perhaps to evaluate managerial performance - how well is a firm's management using the assets to generate accounting returns of investment, assets or sales. However, since these measures are used to investigate a firm's performance in terms of profitability, this study applied ROE as an accounting based measure of performance and Tobin's Q which has enabled performance measures to consider the current market value of the capital and gives robustness to the measurements.

Tobin (1969) postulated that the driving force for investment is the Q-ratio. He defined the Q-ratio as the ratio of the market value of existing capital to its replacement value. The Q-frame work states that in the absence of capital market imperfections, value maximizing firms will invest as long as the shadow price of a marginal unit of Q exceeds unity. So Tobin's Q is the ratio of market capitalization to book value of assets and was measured by:

$$\frac{Market\ Capitalization}{Book\ Value\ of\ Net\ Assets}$$ …………………………………………………………….Eq. 3.1

High value of Tobin's Q indicates strong growth opportunities and better performance i.e. high market value compared to its replacement cost (Annavarjula and Beldona, 2000). According to Cole and Mehran (1998), it is necessary to choose measures of performance that are quantifiable, expressive and comparable. The current study therefore used Tobin's Q as a market based measure of performance because it met these three attributes.

Return on equity (ROE) is the amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. ROE is expressed as a percentage and is calculated as:

$$\frac{Net\ Income}{Shareholders'\ Equity}$$ …………………………………………………………Eq. 3.2

Scholars have previously used ROE as a single time period measure and characterized for merchandised form of business assessed within one year. Where data is constant, ROE becomes a suitable measure because there are no variations over the years. Where data is constant, ROE becomes a suitable measure just like it measures a single period.

3.7.1.3 Financial Leverage

Leverage is defined as a ratio of interest bearing debt to total assets. It shows the extent to which the firm depends on debt financing. Financial economic theories predict positive relationship between leverage and performance. For example, MM II predicts positive relationship in the presence of tax shield.

The majority of accounting measures and marketing measures have focused on measuring return, rather than focusing on risk. An example of an accounting risk measure is the debt-equity ratio. This measures the risk of becoming bankrupt. Most risk measures are linked to market measures because most risks derive from the market.

Nwude (2003) defines debt to equity ratio as a measure of the proportion of debt to shareholders funds (i.e Net Worth) in the total financing of a business. Items such as accumulated losses and deferred expenditures are eliminated from the shareholders' funds before using it as the denominator. "The ratio indicates how much naira was raised as debt for N1 of equity". Okwo *et al.,* (2012) opines that debt to equity ratio is a financial ratio indicating the relative proportion of equity and debt used to finance a company's assets which is an indicator of the financial leverage. It is equal to total debt divided by shareholders' equity.

3.7.1.4 Firm Size

Firm size, as a construct of firm characteristics, is one of the most acknowledged determinants of financial performance. Firms with the greatest market share and assets report relatively better performance. The market power and access to capital markets of large firms may give them access to investment opportunities that are not available to smaller ones (Amato & Burson, 2007).

A moderator is a variable that alters the direction or strength of the relation between a predictor and an outcome (Baron & Kenny, 1986). Firm size as a moderator variable is very

important because larger firms are known to have more capacities and resources. This enables them to enjoy economies of scale, qualified personnel and they are diversified to resist economic shocks. It is expected that firm size is positively related to performance. In confirming Baumol's size-profits hypothesis, (Lee, 2009) found a positive relationship between firm size and firm performance. Similar findings from (Nunes et al., 2009) and (Babalola, 2013), all confirmed Baumol's hypothesis. While different measures of firm size have been proposed, the present study used ratio of sales to total assets to measure firm size because it is simple and easily understandable, (Vijayakumar & Tamizhselvan, 2010); (Akbas & Karaduman, 2012) and (Otieno, 2013).

3.7.1.5 Asset Tangibility

Asset tangibility also influence both financial performance and financial leverage. Larger firms hold high tangible assets that they can use as collateral while borrowing external debt. Consequently, these larger firms access the debt market easily at lower cost to gain tax advantages. To conform previous studies that have looked at asset tangibility (Mule & Mukras, 2015), asset tangibility was measured by the ratio of non-current assets to total assets.

3.7.1. 6 Firm Age

Firm age is also to be controlled since older firms have financial leverage decisions at the center stage which may influence firm performance. The older the firm, the more experienced and resilient it becomes. The market shocks and challenges that they have endured give them an added advantage in terms of profitability, sales growth and stability. On other hand, firm performances deteriorates with age as older firms experience inertia in profitability. Also older firms have obsolete assets, high labor costs, declining investments and rent seeking behaviors like large boards and higher CEO pay. Firm age can be measured in two ways. Number of years since incorporation or number of years since listing in the securities exchange. In tandem with previous studies, such as Loderer & Waelchli, (2010), firm age was measured by the number of years since incorporation.

3.7.2 Testing Linearity of Residuals

In linearity, we assume that the relationship between the response variable and the predictors is linear. If this assumption is violated, the linear regression will try to fit a straight line data that does not follow a straight line. Therefore to check for linearity in the case of the multiple

regression for this study, the standardized residuals against each of the predictor variables was plotted in the regression model. Therefore the first scatter plot in page 49 shows the linearity between financial leverage and ROE
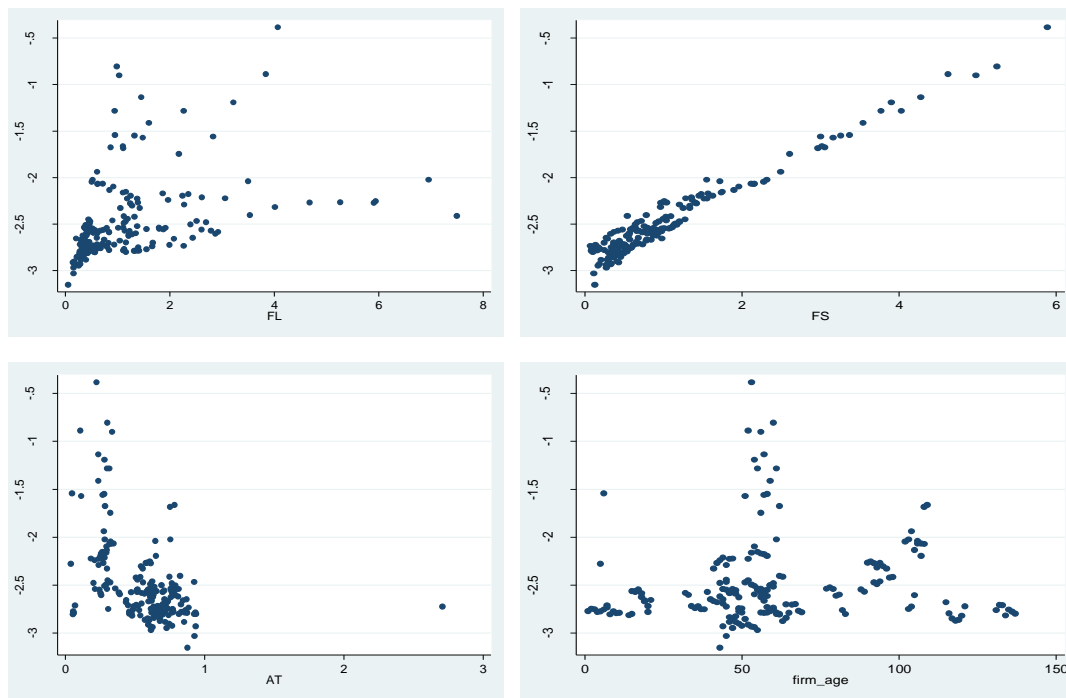
Figure 3.1: Scatter Plot for Linearity Test
Source: Field Data, 2019

The plot shows that the patterns were more accumulated at the left corner and spread progressively to the right. This indicated some small non linearities which does not affect regression model. These small indicators though not significant, were also corrected using the robust command in stata. In the case of firm size, the results indicated an accurate linear linearity assumption which did fit the data well as indicated by a cigar shape to the right that can accurately give the line of best fit. Asset tangibility as well as firm age indicated non linearity which was also corrected using robust command. A similar pattern was realized for Tobin's Q as the predictor variable.

3.7.3 Testing for Normality of Residuals
The assumption of normality of residuals signifies the generalizability of findings (Gujarati, 2007). Therefore, the study sought to establish the normality of the data using kernel density estimate stata inbuilt command. The result is presented in figure 3.1 on page 49.
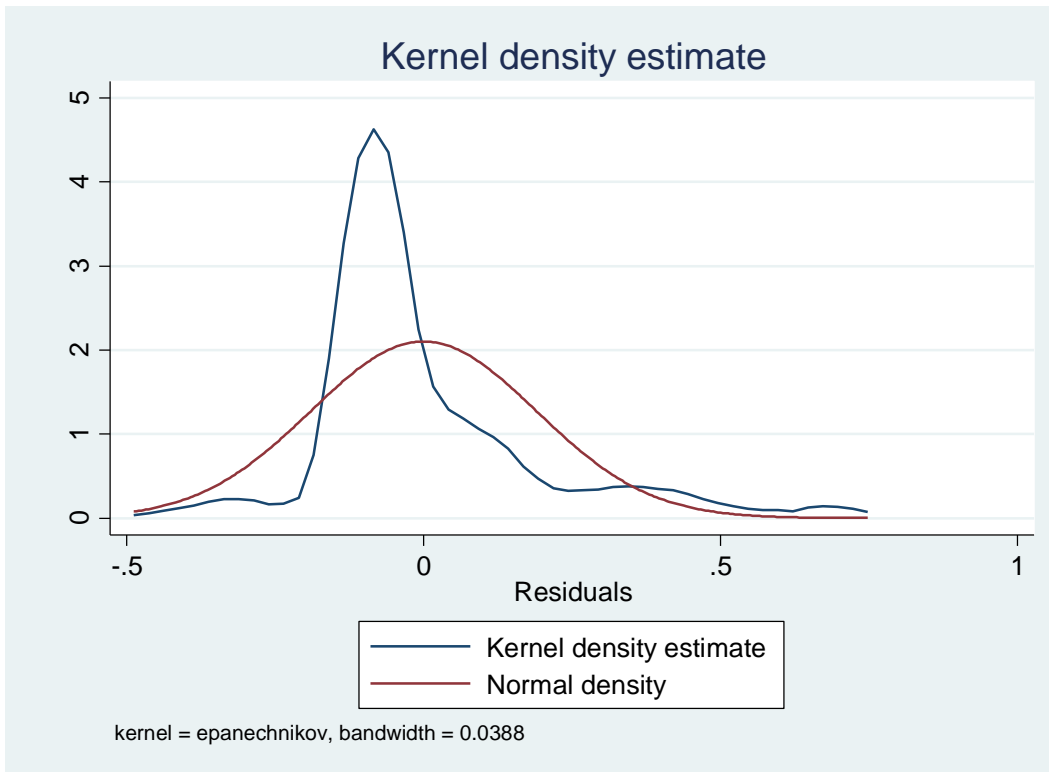
Figure 3.2: Normality Test
Source: Field Data, 2019

From Figure 3.2 above, there was some skewed distribution which was corrected to normality as indicated by a bell shaped curve. This indicates normality at a mean of zero and deviation of 0.5. Therefore, data was normalized before analysis in order to meet the regression assumptions. In this study, normality was diagnosed using a histogram of regression standardized residuals along with their summary statistics for financial performance of listed firms. Specifically, skewness which measures the degree of asymmetry of the distribution was tested and kurtosis which measures the relative peakedness or flatness of the distribution relative to the normal distribution.

3.7.4 Testing for Homoscedasticity.

The other assumption for regression is homoscedasticity. This condition is fulfilled if the error term has the same value despite the values taken by the independent variables. Using probability normal distribution, the findings are presented as shown in Figure 3.3 in page 49.
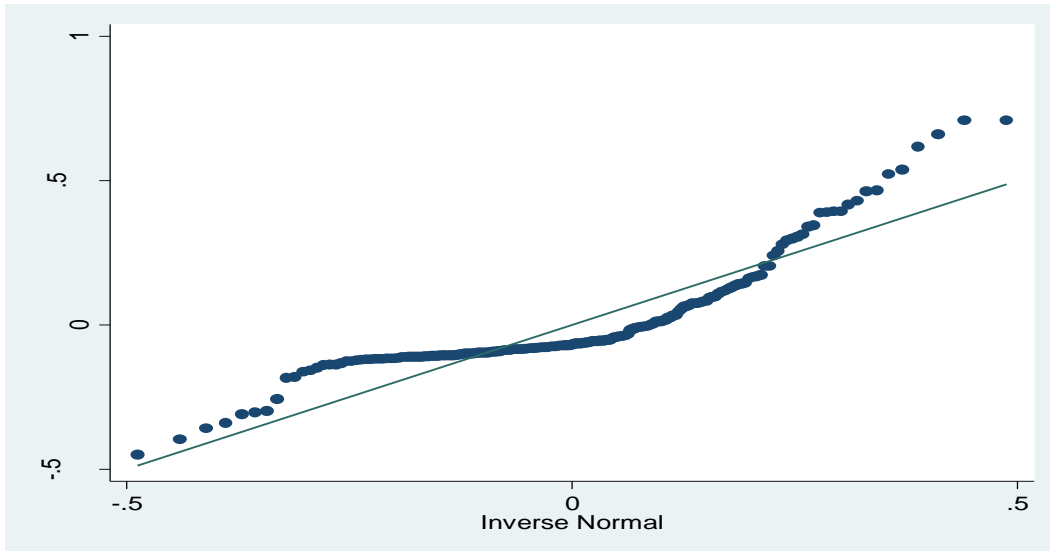
Figure 3.3: Homoscedasticity

Source: Field Data, 2019

The findings in figure 3.3 above indicate some deviation of data point from the mean line but in the same direction. There is very little violation of the condition which was corrected. If the assumption does not hold well, then the data is heteroscedastic which means that the regression analysis will yield biased standard errors, spurious results and incorrect conclusions about significance of the regression coefficients (Field, 2000). Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, the findings revealed a small chi square value 0.86 with a probability greater than chi square value emerging very big, (0.245). In this case, since the chi square value is very small, heteroskedasticity is not a problem.

3.7.5 Testing for Autocorrelation

Autocorrelation refers to lack of independence between the residual terms of observations (Field, 2000). To test for serial correlations, Wooldridge test for autocorrelation in panel data with H0: no first-order autocorrelation was carried out. The findings were not significant $F(1, 27) = 1.285$,   Prob $> F =$ 0.267. This implies that there are no autocorrelations in the data set.

3.7.6 Testing for Multicollinearity

Multicollinerarity which refers to a situation where two or more explanatory variables are highly linearly related as opined by Hair et al. (2010) was also tested before data analysis because, highly collinear explanatory variables make estimation of individual regression

coefficients and their standard errors difficult resulting in estimators that are not best linear unbiased estimators. In this regard, the variance inflation factor (VIF) and tolerance values measures that were tested were within the threshold values. For instance, firm size had a tolerance value of 0.699 and a VIF of 1.430, asset tangibility had a tolerance of 0.738 with VIF of 1.350 and finally, financial leverage had a tolerance of 0.921 and VIF of 1.090. Therefore all the tolerance values were above 0.100 while the VIF values were below 10 implying that there were no multiple high correlation among the independent variables.

3.7.7 The Hausman Test

Pre-analysis to determine the most appropriate model among the models used with panel data was carried out. The Hausman test of the null hypothesis that the random coefficients would be consistent and efficient verses the alternative hypothesis that random effects would be inconsistent was carried out. The findings are presented as shown in Table 3.2 below.

Table 3.2: Hausman Test

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	Difference	S.E.	
FL	.0198	.0208	-.001	.002
FS	.0543	.0521	.002	.007

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2(2)} = \text{(b-B)'}[(V\_b-V\_B)^{\wedge}(-1)](b-B)$$

$$= \quad 0.560$$

Prob>chi2 =   0.757

Source: Field Data, 2019

From the findings, the test leads to rejection of the null hypothesis which stated that random coefficient would be consistent and efficient. This is evident from the Prob>chi2 = that is greater than 0.050, which is 0.757. Therefore, an alternative hypothesis was adopted, which states that random model would be inconsistent and therefore we adopted the fixed effects model. It can thus be said that the firm effects are correlated with the explanatory variables. These effects can therefore be treated as fixed and therefore the fixed estimators would be

consistent and efficient. Further pre-analysis performed to test for the fixed effect model revealed that there were no significant differences of the model effects across the seven year period which supports fixed effects and also, conforming to the assumption that if the panels are greater than time, then fixed effect is the most appropriate model.

3.7.8 Breusch and Pagan Langrangian Multiplier Test for Random Effects.

```
Breusch and Pagan Lagrangian multiplier test for random effects

        ROE[ID,t] = Xb + u[ID] + e[ID,t]

        Estimated results:
                            |       Var       sd = sqrt(Var)
                   ─────────┼───────────────────────────────
                        ROE |    .0715815          .2675472
                          e |    .0377232          .1942245
                          u |    .0133251          .1154344

        Test:   Var(u) = 0
                        chibar2(01) =      26.05
                      Prob > chibar2 =    0.0000
```

Source: Field Data, 2019

3.8 Data Analysis

The data was analyzed using quantitative approaches such as descriptive statistics, panel multiple regression analysis by pooling the data of 28 firms over 7 year's period to get 196 observation points. The purpose of descriptive statistics is to enable the researcher to meaningfully describe a distribution of scores or measurements using a few indices or statistics (Mugenda & Mugenda, 2005). In this study, mean and standard deviation were used in analyzing the descriptive statistics. Panel regression analysis was used to determine the effect of financial leverage and firm size on financial performance.

In analyzing the relationship between the moderating effect of firm size on financial leverage and financial performance of non-financial firms listed in the NSE Kenya, the panel data methodology was adopted because the study combined both time series and cross sectional data. Panel data are said to be repeated observations on the same cross- section, typically of individual variables that are observed for several time periods. Panel data analysis method allows for a number of regression analyses in both spatial (units) and temporal (time) dimensions. It also provides a major means to longitudinally analyze the data especially when the data are from various sources and the time series are rather short for separate time series analysis. Even in a situation when the observations are long enough

for separate analyses, panel data analysis gives a number of techniques that can help examine changes over time common to a particular type of cross-sectional unit. Besides that, the study also adopted the Johnson-Neyman (J-N) technique for computing the interaction coefficients (as suggested and explicated in Hayes & Matthes, 2009), and analyzed the moderating effects graphically (following the recommendations of Brambor et al., 2006) which permits maintaining of the continuous character of the moderating variable.

3.9 Model Specification

To conform to previous moderation studies, this study adopted the model used by Abbasi and Malik (2015) with some modifications. The study used panel data estimation which has the characteristics of both cross sectional and time series to study the effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the Nairobi Securities Exchange in Kenya.

A panel regression model was used in this study by pooling the data of 28 firms over 7 year period to get 196 observations of each variable. Its equation is differentiated from simple cross sectional or time series equation by adding the subscripts (i,t) with each variable. The panel regression model of this study or the Econometric model of the research is expressed as follows:

Firm performance = f (Leverage)

Model 1 is developed to study the relationship between Financial Leverage and Financial performance.

$$ROE_{it} = \alpha + \beta_1 DER_{it} + \varepsilon_{it} \quad \text{(3.1)}$$

$$ROE_{it} = \alpha + \beta_1 DER_{it} + \beta_2 TANG_{it} + \beta_3 FAGE_{it} + \varepsilon_{it} \quad \text{(3.2)}$$

$$TOBIN'SQ_{it} = \alpha + \beta_1 DER_{it} + \varepsilon_{it} \quad \text{(3.3)}$$

$$TOBIN'SQ_{it} = \alpha + \beta_1 DER_{it} + \beta_2 TANG_{it} + \beta_3 FAGE_{it} + \varepsilon_{it} \quad \text{(3.4)}$$

Model 1 is a panel regression of the dependent variable and independent variable.

Equations (1 - 4) measures whether financial leverage determine financial performance.

Model 2 is developed to study the relationship between Firm Size and Financial performance.

$$ROE_{it} = \alpha + \beta_1 FS_{it} + \varepsilon_{it} \quad \text{(3.5)}$$

$$ROE_{it} = \alpha + \beta_1 FS_{it} + \beta_2 TANG_{it} + \beta_3 FAGE_{it} + \varepsilon_{it} \quad \text{(3.6)}$$

$$TOBINSQ_{it} = \alpha + \beta_1 FS_{it} + \varepsilon_{it} \quad \text{(3.7)}$$

$$TOBINSQ_{it} = \alpha + \beta_1 FS_{it} + \beta_2 TANG_{it} + \beta_3 FAGE_{it} + \varepsilon_{it} \quad \text{(3.8)}$$

Model 3 is developed to study the relationship between Financial Leverage and Financial performance while moderating the effects of firm size.

It is a panel data regression model on the combined effect of both the independent variable and the moderating variable on dependent variable.

$$ROE_{it} = \alpha + \beta_1 DER_{it} + \beta_2 FSit + \beta_3(DER \times FS) + \varepsilon_{it} \quad \text{(3.9)}$$

$$ROE_{it} = \alpha + \beta_1 DER_{it} + \beta_2 FSit + \beta_3 TANG_{it} + \beta_4 FAGE_{it} + \beta_5(DER \times FS) + \varepsilon_{it} \quad \text{(3.10)}$$

$$TOBIN'S\ Q_{it} = \alpha + \beta_1 DER_{it} + \beta_2 FSit + \beta_3(DER \times FS) + \varepsilon_{it} \quad \text{(3.11)}$$

$$TOBIN'S\ Q_{it} = \alpha + \beta_1 DER_{it} + \beta_2 FSit + \beta_3 TANG_{it} + \beta_4 FAGE_{it} + \beta_5(DER \times FS) + \varepsilon_{it} \quad \text{(3.12)}$$

Where;

ROE_{it} = is the measure of Performance of firm i during time t;

$TOBIN'S\ Q_{it}$ = the ratio of market capitalization to book value of assets of firm i during time t. This equally represents financial performance of firms.

DER_{it} = Debt Equity ratio as a proxy of financial leverage of firm i during time t;

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ = Regression equation coefficients for model 1, 2 and 3

FS_{it} = firm size which is a moderator variable. This variable was measured by ratio of sales to total assets of firm i during time t;

α = unknown intercept for each entity

$TANG_{it}$ = Asset Tangibility of Firm i during time t. (conceptual framework - figure 1.1)

$FAGE_{it}$ = Firm Age of Firm i during time t. (conceptual framework - figure 1.1)

ε_{it} = the error term within a confidence interval of 5% at time t

The choice of two performance measures is motivated by the fact that these indicators have different interpretations regarding the firm's performance as proposed by de Mesquita and Lara (2003). According to Cole and Mehran (1998), it is necessary to choose measures of performance that are quantifiable, expressive and comparable. Market-based indicators seek to predict future situations and are mostly driven by factors that cannot be controlled by the firm's managers while accounting-based measurements demonstrate a firm's current situation, and are mostly driven by factors that can be controlled by the firm. The current study, therefore used the two measures of performance because they meet these three attributes.

CHAPTER FOUR

RESULTS AND DISCUSSION

This section presents the findings of the study based on the summary overview of the objectives of the study. First, the summary of the study entailed the total pooled observations, means, standard deviations, minimum and maximum values for the variables of the study. The variables of the study were the firms' financial leverage, firm size and financial performance. Financial performance was measured by Return on Equity (ROE) and the Tobin's Q. Summary of the findings are presented as shown in Table 4.1 below.

Table 4.1: Firm Summary Characteristics

Variable	Observations	Mean	Std. Dev.	Min	Max
Year	196	2015	2.005	2012	2018
Firm age	196	59.250	31.282	1	137
AT	196	0.565	0.272	0.039	2.708
FL	196	1.168	1.209	0.0510	7.499
FS	196	1.011	1.022	0.07 0	5.891
New-firm size	196	1.255	0.594	1	3
Tobin's Q	196	0.165	0.201	0.006	0.904
ROE	196	0.201	0.266	0.000	2.601

FL-Financial Leverage; FS-Firm Size; ROE-Return on Equity

Source: Field Data, 2019

After pooling the data, a summary statistics of the findings are presented as shown in Table 4.1 above. The findings indicate that the base study year was 2012, as indicated in the minimum column, whereas the maximum year was 2018. The year standard deviation was 2.000, with a total of 196 pooled observations. For the measure of the firm age, the average age of all the firms was 59.250 years, with a standard deviation of 31.282, a minimum age of 1 and a maximum of 137 years over all the study companies. Firm size had a mean of 1.010 with a standard deviation of 1.022. The minimum value of firm size was 0.070 while the maximum was 5.891. Firms were categorized as small, medium and large on the basis of the ratio of sales to total assets. Firms whose values lie within the first quartile were considered as small firms. Similarly, firms that lie in the fourth quartile are labeled as large firms while

remaining second and third quartile are considered as medium sized firm. The findings are presented in Figure 4.1 below.
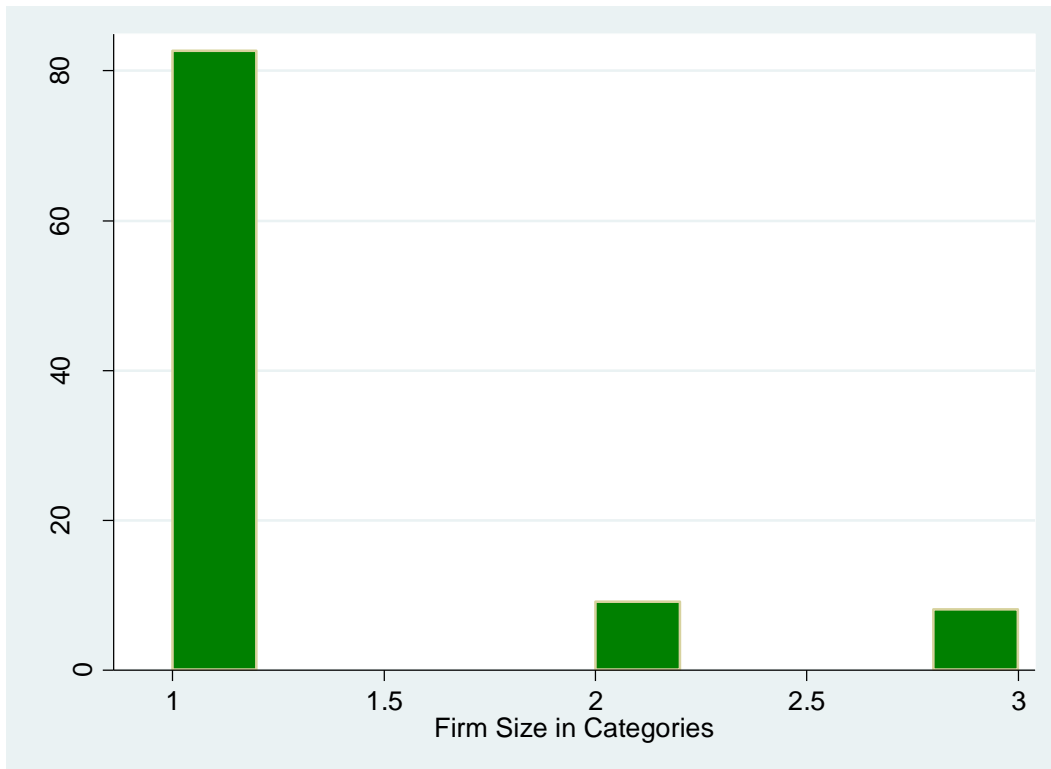
Figure 4.1: Histogram on Categories of Firm Size
Source: Field Data, 2019

Asset tangibility had the smallest mean measure of 0.565 as compared to other covariates, whereas financial leverage had the highest mean measure of 1.168. For the maximum measures, financial leverage maintained the highest mean of 7.499, also with the largest standard deviation of 0.273.This implied that firms had averagely higher amount of borrowed money which did not have much spread as observed on the standard deviation For the measures of financial performance, Tobin's Q had a mean of 0.165 with a standard deviation of 0.201. The minimum value of Tobin's Q was 0.006 while the maximum value was 0.904. Given that Tobin's Q had a mean ranging between 0 and 1, it can be deduced that averagely, the firms' market value is smaller to their book value hence the cost to replace the firms' asset is higher compared to market value. For Return on Equity (ROE), the mean value was 0.209 while the standard deviation was 0.266 with minimum and maximum values of 0.000 and 2.601 respectively. The mean of the firms' return on equity is low implying that the

investors' profit was small but promising or progressive. Since the standard deviation was below 1, it means that there was no much variation across the individual means.

A time series analysis of the financial performance of the individual firms based on the financial measures of performance was also carried out. Both Tobin's Q and ROE were considered using the graphs. First, an extermination of the graphs for the individual firms indicates that there was a relatively constant performance for most of the firms except three companies that had a positive change (increasing) financial performance over the years. These firms included the (3), (7) and (19). Other firms such as (14), (21), (24) and (25) were registering poor financial performance as the years went by. However, the other firms registered constant financial performance over time. The findings are presented in Figure 4.2 below.
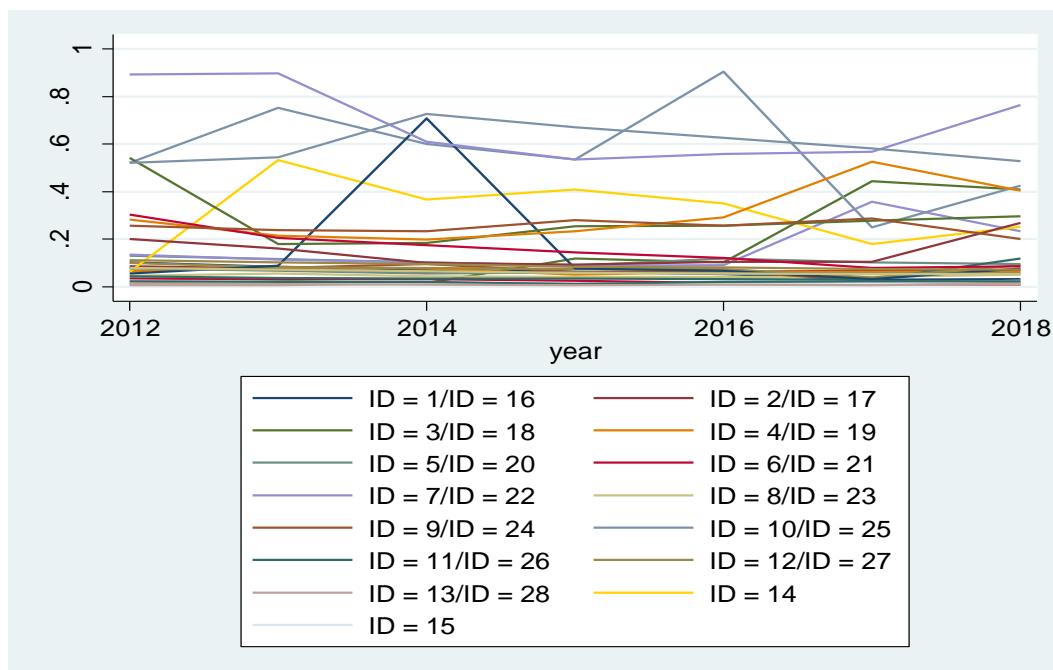
Figure 4.2: Comparative analysis based on Tobin's Q
Source: Field Data, 2019

Figure 4.2 above indicates that there were not more than five firms that had a value of Tobin's Q above 0.4. However, there was varying performance across the years. From the Figure, it is clear that there was increasing financial performance over the years for firms (3), (7) and (19). Other firms such as (14), (21), (24) and (25) registered declining financial

performance as the years went by. However, the other firms registered constant financial performance over time.

In order to check for heterogeneity of Tobin's Q across the firms, a graph was plotted using the within means of Tobin's Q for each of the companies. The findings are presented as shown in Figure 4.3 below.
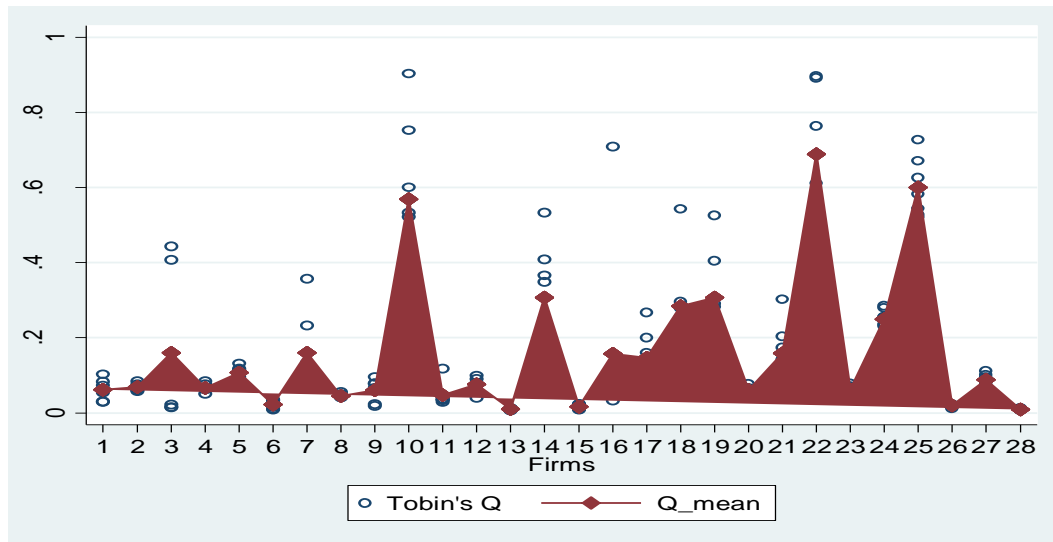
Figure 4.3: Fixed effects heterogeneity of Tobin's Q
Source: Field Data, 2019

The findings in Figure 4.3 above show the fixed effects heterogeneity across the companies. Various companies have a relative approximate mean ranging between 0 and 2. For instance, companies 1, 2, 4, 6, 8, 9,11,12,13,15,20,23, 26 and 28 have low means. Companies 14, 18, 19, and 24 have their means ranging between 2 and 4 Tobin's Q values while companies 10, 22 and 25 have high mean values of Tobin's Q for all the years. None of the firms have their Tobin's Q mean value above the threshold value of 1. All the firms have their values ranging between 0 and 1 implying that the stocks are undervalued thus the cost to replace these firms assets is greater than the value of the stock across all the years.

Firms (3), (10) and (19) registered an improved financial performance (ROE) as indicated in figure 8. Companies (13), (17) and (18) have however consistently registered poor financial performance, with consistent negative growth. The rest of the companies, however have registered approximately the same financial performance. This implies that there could be little or no significant changes in ROE of the companies across the years. Further analysis of

the firms' performance by ROE by line graph comparison was carried out. A plot of all the values of ROE across the years was presented as shown in Figure 4.4 below. The findings indicate that the ROE values of firms 3, 18, 14 and 28 emerged above the rest of the firms across the years even though they were not consistent.
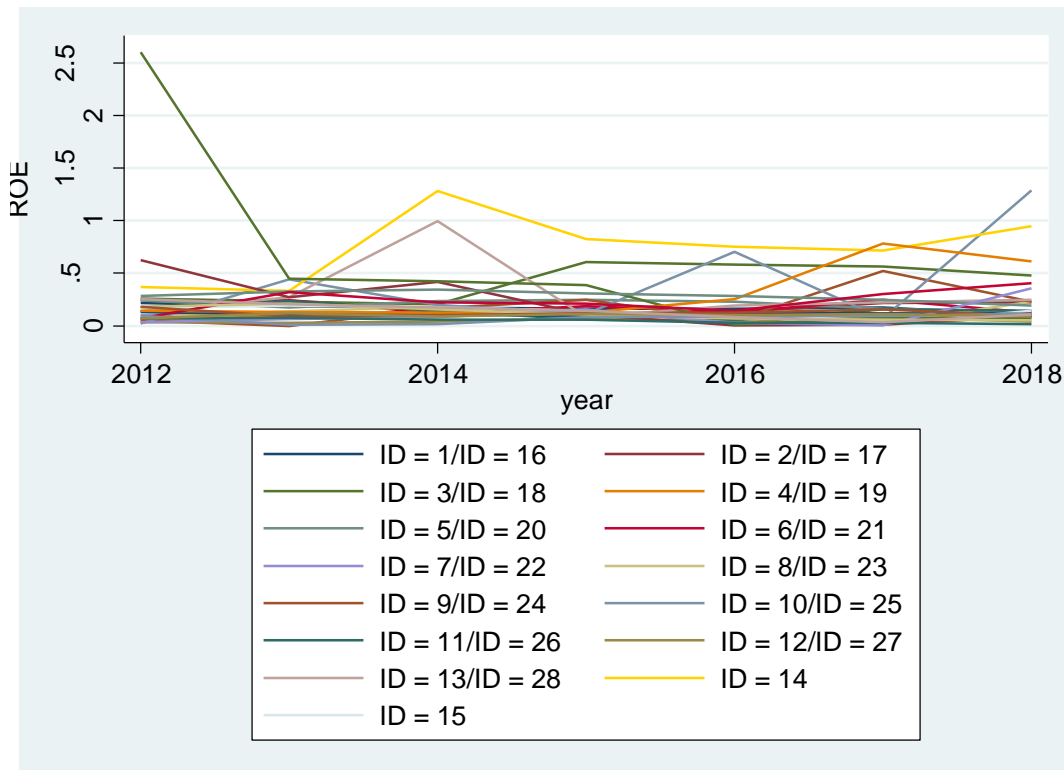
Figure 4.4: Comparative analysis based on ROE
 Source: Field Data, 2019

Analysis of ROE heterogeneity across the firms was also analyzed graphically. The firms have their labels by their numbers, that is, 1 to 28. The mean values of the ROEs were used across the firms based on the within means of each firm. The findings are presented in Figure 4.4 above and Figure 4.5 page 60.

Analysis of ROE heterogeneity across the firms was also analyzed graphically. The firms have their labels by their numbers, that is, 1 to 28. The mean values of the ROEs were used across the firms based on the within means of each firm. The findings are presented in Figure 4.5 page 60.
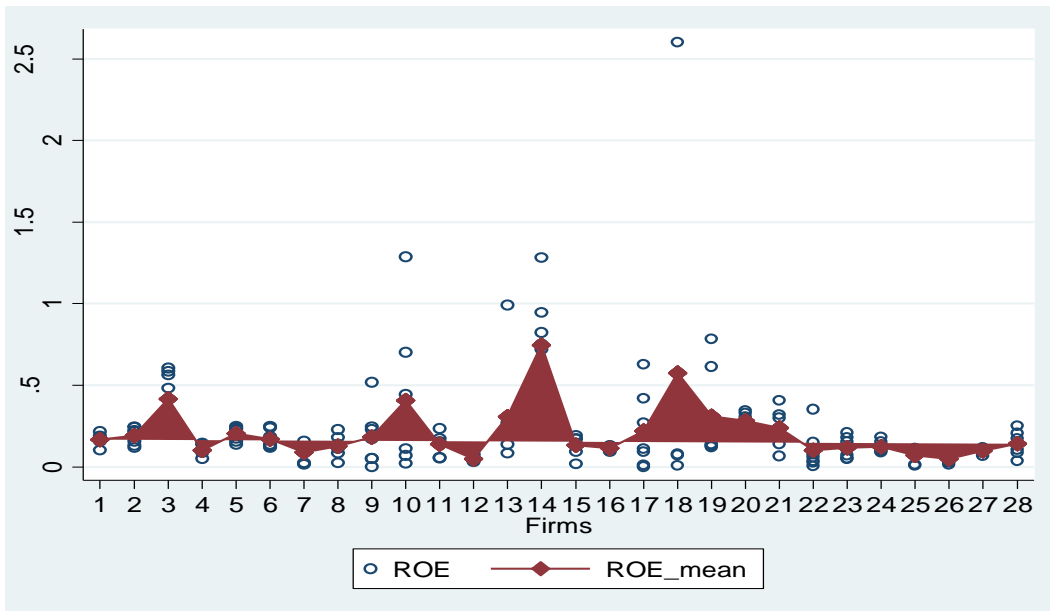
Figure 4.5: Fixed effects heterogeneity of ROE

Source: Field Data, 2019

The findings indicate that none of the firm had their mean value of ROE above value 1. All of the values ranged between 0 and less than one. The firm with highest mean ROE was 14 followed by 18 and finally 10 and 3, whose values were slightly above the mean ROE which is approximately 0.6.

4.1 Effect of Financial Leverage on Financial Performance of Non-financial Firms Listed in the NSE

The first objective of the study was to establish the effect of financial leverage on financial performance of non-financial firms listed in the NSE. The first measure of firm's performance used was Return on Equity (ROE). In the first case, analysis was carried out with financial leverage as the only predictor. The findings on the effect of financial leverage on performance (ROE) using fixed effects model are presented as shown in Table 4.2 page 63.

Table 4.2: Effect of Financial leverage on Firm Financial Performance using ROE

Fixed-effects (within) regression			Number of observation=			196
Group variable: ID			Number of groups =			28

R-sq: within	= 0.293					
Between	= 0.334		$F(1,167)$		=	4.510
Overall	= 0.299		Prob >		=	0.043
			F			
			(Std. Err. adjusted for 28 clusters in ID)			
ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
DER	**0.141**	0.067	2.120	0.043	0.005	0.278
Cons	0.044	0.078	0.560	0.577	-0.116	0.204
sigma_u	0.136					
sigma_e	0.196					
Rho	0.325	(fraction of variance due to u_i)				

Source: Field Data, 2019

The results on the effect of financial leverage on performance using ROE as the financial measure are presented in Table 4.2 above. The findings shows that financial leverage accounts for 29.99% overall variation in financial performance (R square overall=0.299). An observation of between variance (which is the variance between the firms) indicated that the variance was 33.4% (R square between=0.334) while the variance within each of the company accounted for by financial leverage was 29.30% (R square within=0.293). These findings were significant as indicated by F value and probability values (F (1, 167) =4.51, Prob>F=0.043. This indicates that the findings were significant at a p value less than 5% (p<.05). The hypothesis that financial leverage has effect on financial performance of non-financial firms listed in the NSE was therefore supported. Hence, the hypothesized model was therefore confirmed to be;

$Y = 0.044 + 0.141 \text{ DER} + \varepsilon_{it}$.

The model implies that a unit change in financial leverage results in 0.141 units in financial performance of non-financial firms listed in the NSE.

Further analysis of the effect of financial leverage on return on equity of the firms while controlling for the effect of age of the firms and asset tangibility were also carried out. The findings are presented in Table 4.3 in page 62

Table 4.3: Effect of Financial leverage on Firm Financial Performance using ROE while controlling for Firm Age and Asset Tangibility

Fixed-effects (within) regression			Number of observations	=	196
Group variable: ID			Number of groups	=	28

R-sq: within	= 0.296		Observations per group: min =		7
Between	= 0.088		F(3,165)	=	23.110
Overall	= 0.158		Prob >	=	0.000
			F		

corr(u_i, Xb) = -0.5035

(Std. Err. adjusted for 28 clusters in ID)

ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
DER	**0.142**	0.017	8.300	0.000	0.108	0.176
TANG	0.056	0.088	0.640	0.524	-0.118	0.231
FAGE	-0.004	0.007	-0.550	0.581	-0.017	0.009
Cons	0.242	0.416	0.580	0.562	-0.581	1.067
Sigma_u	0.195					
Sigma_e	0.196					
Rho	0.497	(fraction of variance due to u_i)				
F test that all	u_i=0:	F(27, 165) =	3.150		Prob > F = 0.000	

Source: Field Data, 2019

Table 4.3 indicates that the ROE within group variance accounted for by financial leverage after controlling for the effect of asset tangibility and age of the firm was 29.6% (R square within=0.296). This variance is slightly larger as compared to the variance obtained in Table 4 without controlling for the two variables. However, it emerged that the between group variance, which is 8.8% obtained after controlling for asset tangibility and age of the firms (R square between=0.088) is lower by a margin of 24.54% (ΔR^2 within=0.245) implying that asset tangibility and age of the firms largely vary across the firms and therefore when their intervention is eliminated R square between or the variance between the companies reduces. It, however, emerged from the intra-class correlations coefficient (rho=0.497) or 49.70% that there was an increased variance across the panels after controlling for the effect of asset tangibility and age. This implies that age and asset tangibility leads to an increase in the differences across the panels.

The model coefficient for financial leverage (Coef= 0.142) was also found to be positive and significant, t(196)=8.300, P>|t|=0.000, implying that financial leverage positively and significantly contributes to return on equity even after controlling for the effect of age of the firms and asset tangibility. Therefore, the hypothesized model was therefore confirmed to be;

Y = 0.242 + 0.142 DER + 0.056 TANG – 0.004 FAGE + ε_{it}.

The model implies that a unit change in financial leverage results in 0.142 units in financial performance of non-financial firms listed in the NSE.

Further insights from these findings indicate that variance in ROE after controlling for age of the firm and asset tangibility reduced to 15.8% from 29.9%, indicating a deviation of 14.1% which is a big difference. The firms' return on equity is therefore somehow dependent on the firm's assets and age even though the direct dependence is suppressed by financial leverage. Conversely, it can be deduced that financial leverage does not lose its effect on a firms' return on equity even after eliminating their differences in age and asset tangibility.

Return on equity percentage variance between firms 33.40% before controlling for their differences in assets and age was larger as compared to variance in return on equity between the firms after controlling for these variables (8.88%). This means that the presence of these factors (Asset tangibility and age) increases the value of return on equity by a margin of 24.52%. It can also be reported from a different perspective that inclusion of the asset tangibility and age of the firms to the model may increase the difference in the model outcome.

Another important aspect of the firms to observe is the reduction of R-squared from 0.299 to 0.158 (before and after controlling for firm age and asset tangibility). The general point holds that if you include extra variables in the model, the value of R-squared increases, however, the reported phenomenon shows a decreasing R-squared when using the FE estimator. There are two main reasons; first, with fixed effects, there are no coefficients of the firm dummies whereas, these are explicit with least squares dummy variables (LSDV). Secondly, the constant in fixed effects is the average of the fixed effects. This implies that fixed effects will underestimate or overestimate fitted values to the extent that the exclusion of these firm dummies and the differences between the constant terms represents. Therefore, including the coefficients of the interaction terms but excluding the coefficients of the firm dummies plus the effect of the differences in the constant terms can decrease the correlation between the predicted outcome and the outcome itself. This leads to a lower R-squared statistic. In other words, a study will never have the case of a lower overall R-squared in LSDV but this can happen with the fixed effects estimator in Stata.

Financial performance was also measured using Tobin's Q. this was regressed against financial leverage. The findings on the effect of financial leverage on Tobin's Q are presented as in Table 4.4.

Table 4.4: Effect of Financial leverage on Firm Financial Performance using Tobin's Q

Fixed-effects (within) regression			Number of observation=		196	
Group variable: ID			Number of groups =		28	
R-sq: within	= 0.043					
Between	= 0.090		F(1, 167)	=	7.430	
Overall	= 0.067		Prob > F	=	0.007	
corr(u_i, Xb) = 0.145						
				(Std. Err. adjusted for 28 clusters in ID)		
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
DER	0.022	0.008	2.730	0.007	0.006	0.038
Cons	0.139	0.012	12.060	0.000	0.116	0.161
sigma_u	0.178					
sigma_e	0.093					
Rho	0.788	(fraction of variance due to u_i)				
F test that all u_i=0: F(27, 167) = 25.43			Prob > F = 0.000			

Source: Field Data, 2019

The overall percentage variance in Tobin's Q that was accounted for by financial leverage was 6.70% (R square =0.067), while the within and between variance was 4.3% and 9.0% as indicated by 0.043 and 0.090 respectively. The overall model was found to be significant, $F(1, 167)=7.43$, p=.007. In addition to the findings, an examination of the model coefficient results indicate that financial leverage has a positive significant effect on Tobin's Q (coefficient=0.022, P>|t|=0.007). The hypothesis that financial leverage has effect on financial performance of non-financial firms listed in the NSE was therefore supported using Tobin's Q. Hence, the hypothesized model was therefore confirmed to be;

Y = 0.139 + 0.022 DER + ε_{it}.

The model implies that a unit change in financial leverage results in 0.022 units in financial performance of non-financial firms listed in the NSE. A further implication could be that more borrowing or loans to improve the business leads to an increase in market value of the firms.

The study also sought to establish the effect of financial leverage on Tobin's Q after controlling for the effect of age of the firm and asset tangibility. Age of the firm is important towards the firm's acquisition of financial leverage since older firms could be regarded as more established as compared to younger firms. Therefore, older firms are more likely to acquire more or large financial leverage as compared to younger firms which are not fully established. Firms with large assets are said to hold more value compared to the firms with small asset. Financial institutions could thus prefer larger asset firms because they hold high tangible assets that they can use as collateral while borrowing external debt. Therefore age of the firm and asset tangibility were controlled for while regressing Tobin's Q against financial leverage. The findings are presented in Table 4.5 below.

Table 4.5: Effect of Financial leverage on Firm Financial Performance using Tobin's Q while Controlling for Asset Tangibility and Firm Age

Fixed-effects (within) regression			Number of observations	=		196
Group variable: ID			Number of groups	=		28
R-sq: within = 0.049			Observations per group: min = 7			
Between = 0.008			F(3,165)		=	2.85
Overall = 0.011			Prob > F		=	0.039
corr(u_i, Xb) = -0.252						
				(Std. Err. adjusted for 28 clusters in ID)		
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
DER	0.022	0.008	2.700	0.008	0.006	0.038
TANG	-0.035	0.041	-0.840	0.401	-0.118	0.047
FAGE	-0.002	0.003	-0.610	0.541	-0.009	0.004
Cons	0.279	0.197	1.420	0.158	-0.109	0.669
Sigma_u	0.189					
Sigma_e	0.093					
Rho	0.806	(fraction of variance due to u_i)				
F test that all u_i=0: F(27, 165) = 23.21 Prob > F = 0.000						

Source: Field Data, 2019

The findings in Table 4.5 in page 67 are the results of the regression of the effect of financial leverage on performance based on Tobin's Q after controlling for the intervening effect of asset tangibility and age of the firm. The results show that financial leverage accounted for an overall variance of 1.1% in financial performance (Tobin's Q) (R square overall=0.011). The overall model was found to be significant, $F (3, 165) =2.850$, Prob > F 0.039. This also implies that the model was well fit, except that the percentage variance was small. Examining

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the model coefficient results, it is clear that financial leverage had a positive effect (coefficient= 0.022) on financial performance (Tobin's Q) which was significant, P>|t|=0.008. Asset tangibility or the firm's size of the assets as well as age of the firm did not have a significant effect on Tobin's Q since the results on the model coefficients of these two variables were not significant at 0.05 threshold value. The hypothesized model was therefore confirmed to be;

Y = 0.279 + 0.022 DER - 0.035 TANG – 0.002 FAGE + ε_{it}.

The model implies that a unit change in financial leverage results in 0.022 units in financial performance of non-financial firms listed in the NSE. After controlling for the age and asset tangibility of the firms, financial leverage leads to a reduction in firms' market value.

A comparison of these findings indicates that variance in Tobin's Q accounted by financial leverage before controlling for age of the firm and asset tangibility was higher 6.7% as compared to after 1.1%. This implies that the negative deviation or negative margin was 5.6%, obtained by subtracting the variance after from the variance before. This may imply that removing the effect of the age and asset tangibility of the firm leaves financial leverage with little effect on performance. The market value of the firms may therefore be said to be interfered with the assets and age of the firm.

Further comparison of the firms' differences in variance of Tobin's Q reveals a higher variance 9.0% without controlling for asset tangibility and age of the firms as compared to 0.8% after controlling for these variables. There is therefore a margin decrease of 8.2% in the firms' performance due to financial leverage when the two variables are controlled for. This implies that controlling for asset tangibility and age of the firm results in smaller differences in the firms' performance based on Tobin's Q. Therefore firms are more likely to differ in their performance when compared across while removing the effect of age and asset tangibility.

Examining the within firms variance in Tobin's Q, there is an increase from 4.3% to 4.9% after controlling for asset tangibility and age of the firms. This means that the market value of the firms is more likely to increase when we control for age and asset tangibility. Thus it can be deduced that there are firms that have extremely low market value but share the same financial leverage with firms' whose market value is high emanating from the age and asset tangibility factors. There could thus be the limiting case of assets and age of the firm on their

acquisition of financial leverage.

A precise comparison between the two measures was also made before concluding on the overall effect of financial leverage on firm performance. First, it emerged that financial leverage accounted for a bigger variance in firm's return on asset after controlling for age and asset tangibility of the firms as compared to Tobin's Q. the margin difference is extremely large even though there were no clear outline or measure of the significance. Both outcomes (return on asset and Tobin's Q) were significant, implying that financial leverage has a positive effect on firms' performance. Even though both measures of the outcome indicate consistent results in terms of significance, they are slightly different in the context of measurement. Firms' return on asset is an accounting measure while Tobin's Q is a market based measure.

The results therefore, indicate that financial leverage is a significant positive predictor of performance (ROE), $\beta = 0.141$ (P = 0.043) and Tobin's Q, $\beta = 0.022$ (P = 0.007). These values are statistically significant since the p-values are less than 0.05. It can be inferred from these values that a unit change in financial leverage leads to an increase in return on equity and Tobin's Q of firms listed at the Nairobi Securities Exchange of 0.141 and 0.022, respectively.

The analysis was to test the null hypothesis (H_O) financial leverage has no effect on financial performance of non-financial firms listed in the NSE. The study rejects the null hypothesis and accept the alternative hypothesis (H_A) financial leverage has effect on financial performance of non-financial firms listed in the NSE. It can thus be concluded that financial leverage has a positive and significant effect on both the market value of the firm and return on equity, with the predictive ability to increase both values when its units are increased.

These findings agree with those of a Canadian service industry by Gill and Mathur (2011), and those of Abor (2005), but contradict those of Majumdar and Chhibber (1999) who found a negative non-significant correlation between financial leverage and profitability in the manufacturing sector. Berger and Bonaccorsi (2006), in the United States also found that higher leverage is associated with better firm financial performance, which implies that financial leverage positively influenced financial performance in the studied firms. Rehman

(2013) also found a positive relationship between the financial leverage and the financial performance of the companies. Other studies such as Majumdar and Chhibber (1999) and Ojo (2012)), found a negative relationship between financial leverage and the financial performance. Akbarian (2013) also found a negative relationship between firm performance and capital structure. Majority of the findings on the direct relationship between financial leverage and firm performance supports a positive significant relationship, especially using at least more than one measure of firm performance. However, regardless of the rare use of Tobin's Q, the findings of the present study can be concluded based on the two measures of financial performance. Therefore, the study concluded that financial leverage has a positive significant influence on financial performance of non-financial firms listed in the NSE.

4.2 Influence of Firm Size on Financial Performance of Non-financial Firms Listed in the NSE

The second objective of the study sought to determine the influence of firm size on financial performance of non-financial firms listed in the NSE. On the backdrop of the notion that smaller firms may succumb to low market value on the basis of comparison or experience low return on equity, it was necessary to establish the effect of size of the firm on financial performance. The findings are presented in Table 4.6 below.

Table 4.6: Influence of Firm Size on Firm Financial Performance using ROE

Fixed-effects (within) regression			Number of observation=			196
Group variable: ID			**Number of groups =**			**28**
R-sq: within = 0.032						
Between = 0.001				F(1,167) = 5.550		
Overall = 0.005				Prob > F = 0.019		
corr(u_i, Xb) = -0.447						
ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.097	0.0412	2.36	0.020	0.015 0.179	
Cons	0.111	0.0448	2.49	0.014	0.022 0.199	
sigma_u	0.184					
sigma_e	0.228					
Rho	0.393	(fraction of variance due to u_i)				
F test that all u_i = 0: F(27, 167) =		3.63		Prob > F = 0.000		

Source: Field Data, 2019

Table 4.6 findings indicate that firm size accounted for an overall 0.5% change in return on equity (R square overall=0.005). These findings were significant, F (1, 167) = 5.55, Prob > F = 0.019. It can be observed that although the overall percentage change in return on equity as

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a measure of financial performance was low, it was still significant. The role of firm size on financial performance, based on return on equity cannot therefore be ignored. It is thus clear that the profit due to shareholders' equity relies on the size of the firm. If the firm is large enough, then shareholders are assured of a larger percentage change in their profit.

The findings on the model coefficient results were also examined. It emerged that firm size contributed positively to the change in return on equity. It therefore has a positive effect (coefficient t = 0.097), which is also significant, P>|t|=0.020. The hypothesis that firm size has effect on financial performance of non-financial firms listed in the NSE was therefore supported. Hence, the hypothesized model was therefore confirmed to be;

$$Y = 0.111 + 0.097 \, FS + \varepsilon_{it}.$$

The model implies that a unit change in firm size results in 0.097 units in financial performance of non-financial firms listed in the Nairobi Securities Exchange. It is thus clear that the net income as a result of the shareholders equity responds positively to an increase in the size of the firms. With larger firms, there is likelihood of more profit generated from the money that shareholders invest. The variance within the companies was also found to be larger than the overall variance of the firms (R square within= 0.032), which is 3.2%. The variance between the firms (R square=0.001 or 0.1%) is however smaller than both the overall variance(R square=0.005 or 0.5%) and the within firm's variance (R square within= 0.032 or 3.2 %) due to size of the firms.

Further analysis on the effect of firm size after controlling for asset tangibility and age of the firm was carried out. This is because firms that have operated for a longer period may have the advantage of the market share and larger customer base while firms with more assets may have high tangibility that can be used as collateral to secure external debts. The findings on the effect of firm size on return on equity after controlling for these two variables are therefore presented in Table 4.7 in page 70.

Table 4.7: Influence of Firm Size on Firm Financial Performance using ROE while controlling for asset Tangibility and firm age

Fixed-effects (within) regression			Number of observations		=	196
Group variable: ID			Number of groups		=	28
R-sq: within = 0.048			Observations per group: min =			7
Between = 0.008			F(3,165)		=	2.750
Overall = 0.017			Prob >		=	0.045
			F			
corr(u_i, Xb) = -0.3618						
ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.131	0.046	2.82	0.005	0.039	0.223
TANG	0.137	0.109	1.26	0.209	-0.077	0.352
FAGE	-0.007	0.008	-0.08	0.937	-0.077	0.352
Cons	0.220	0.488	0.45	0.653	-0.743	1.184
Sigma_u	0.176					
Sigma_e	0.228					
Rho	0.373	(fraction of variance due to u_i)				
F test that all	u_i=0:	F(27, 165) = 3.32		Prob > F = 0.00		

Source: Field Data, 2019

It is shown from the results in Table 4.7 above, that size of the firm accounted for 1.7% variance in the firms' return on equity (R square overall = 0.017). These findings were significant, F (3, 165) =2.750, Prob > F=0.045. This implies that size of the firm accounts for a slightly higher variance in return on equity after controlling for asset tangibility and age of the firm. The margin of change in variance difference in firms return on equity accounted for by size of the firm before and after controlling for the two covariates was 1.2% which was obtained by subtracting 0.005 from 0.017 and multiplying by 100%.

An analysis of the model coefficients indicate that, after controlling for the effect of age and asset tangibility of the firm, the effect of firm size on return on equity maintains a positive (coefficient=0.131) and significant P>\|t\|=0.005 effect on firm performance. The hypothesized model was therefore confirmed to be;

$$Y = 0.220 + 0.131 \text{ FS} + 0.137 \text{ TANG} - 0.007 \text{ FAGE} + \varepsilon_{it}.$$

The model implies that a unit change in firm size results in 0.131 units in financial performance of non-financial firms listed in the Nairobi Securities Exchange. Thus, there is a marginal increase of 0.034 units after controlling for the two variables.

Further comparison of the variance between firm return on equity before and after controlling for the asset tangibility and age indicated a difference. After controlling for these two variables, the variance was high as compared to that obtained before controlling for the two variables. The return on equity variance between the firms accounted for firm size was 0.01% before controlling for the two variables but 0.8% after controlling for the two variables. The difference is 0.79% implies that the two control variables intervene on the percentage variance of return on equity between the firms accounted for by firm size.

The variance within individual firms was 3.2% before controlling for age and asset tangibility of the firms, and 4.8% after controlling for these two variables. Therefore, the difference in these variances is 1.6%, indicating an increase in the latter. This means that when the two variables are controlled for, the firms return on equity increases within the firms.

It can therefore be deduced from these findings that the net income returned as a percentage of the shareholders' equity increases when the size of the firm is increased irrespective of age and asset tangibility of the firm. Therefore, the firms' profits due to shareholders' investment are high for large firms.

The findings on the effect of firm size on performance based on Tobin's Q were also presented. Therefore Tobin's Q was regressed against size of the firms. This is because it is not clear how firms' market value to the existing assets or book value change as the size of the firm increases or reduces. The findings are presented as in Table 4.8 below.

Table 4.8: Influence of Firm Size on Firm Financial Performance using Tobin's Q

Fixed-effects (within) regression			Number of observation=			196
Group variable: ID			Number of groups =			28

R-sq: within	= 0.068					
Between	= 0.062			F(1,167)		= 12.32
Overall	= 0.064			Prob > F		= 0.001
corr(u_i, Xb) = -0.048						
				(Std. Err. adjusted for 28 clusters in ID)		
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.058	0.016	3.51	0.001	0.025	0.090
Cons	0.106	0.018	5.94	0.000	0.071	0.142
sigma_u	0.178					
sigma_e	0.091					
Rho	0.791	(fraction of variance due to u_i)				
F test that all u_i=0: F(27, 167) = 26.45				Prob > F = 0.000		

Source: Field Data, 2019

The findings indicate that firm size accounts for an overall percentage change of 6.4% in a firm's performance. The results also indicate that the overall model was significant, F (1, 167) =12.32, Prob > F = 0.001. Therefore the percentage change in firms' performance (Tobin's Q) is significantly large for any change in size of the firm. However, 93.6% in Tobin's Q is unexplained or can be explained by other factors according to the model results.

For the model coefficient results shown, it is clear that firm size has a positive (coefficient=0.058) and significant P>|t|=0.001 effect on firm performance based on Tobin's Q. Therefore, firm size contributes positively to performance .The hypothesis that firm size has effect on financial performance of non-financial firms listed in the Nairobi Securities Exchange was therefore supported. Hence, the hypothesized model was therefore confirmed to be;

$$Y = 0.106 + 0.058 \ FS + \varepsilon_{it}.$$

The model implies that a unit change in firm size results in 0.058 units in financial performance of non-financial firms listed in the Nairobi Securities Exchange. These findings can also be extended to practical changes in the firms market value compared to the book value which indicated that the ration was small, at less than 1 implying that the cost of replacing the firms' assets is greater than the value of the stock. Therefore, increasing the size

of the firms means that the cost of replacing its assets reduces, which means that performance of the firm increases.

To explore the intervening role of asset tangibility and age of the firm on the firm size-Tobin's Q relationship, regression was carried out while controlling for the two variables. The findings are presented in Table 4.9 below.

Table 4.9: Influence of Firm Size on Firm Financial Performance using Tobin's Q while Controlling for Asset Tangibility and Firm Age

Fixed-effects (within) regression			Number of observations =		196
Group variable: ID			Number of groups =		28
R-sq: within = 0.071			Observations per group: min =		7
Between = 0.027			F(3,165) =		4.20
Overall = 0.031			Prob > =		0.001
			F		
corr(u_i, Xb) = -0.231					
				(Std. Err. adjusted for	
28 clusters in ID)					
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]
FS	0.057	0.017	3.36	0.001	0.023 0.089
TANG	-0.014	0.042	-0.32	0.748	-0.096 0.069
FAGE	-0.002	0.003	-0.53	0.594	-0.008 0.004
Cons	0.219	0.196	1.12	0.266	-0.168 0.607
Sigma_u	0.187				
Sigma_e	0.092				
Rho	0.804	(fraction of variance due to u_i)			
F test that all	u_i=0:	F(27, 165) = 25.54			Prob > F = 0.000

Source: Field Data, 2019

After controlling for asset tangibility and firm age, the findings as indicated in Table 11 above shows that firm size accounted for 3.1% overall variance in performance (Tobin's Q). These findings were also found to be significant as indicated by the overall model significance, $F_{(3, 165)} = 4.20$, Prob > F=0.001. The remaining 96.9% can be said to be accounted for by other factors not included in the model. Therefore the percentage change in firm performance reduced by a margin of 3.3%.

Further examination of the model coefficient results indicates that firm size has a unique contribution to firm performance. This is seen from the findings which indicate that firm size has a positive (coefficient=0.057) and significant P>|t|=0.001 effect on financial performance (Tobin's Q) of the firm. The hypothesized model was therefore confirmed to be;

Y = 0.219 + 0.057 FS - 0.014 TANG - 0.002 FAGE + ε_{it}.

The model implies that a unit change in firm size results in 0.057 units in financial performance of non-financial firms listed in the Nairobi Securities Exchange. It is also important to note that after controlling for the intervening variables (age and asset tangibility of the firms), the firm size coefficient effect on financial performance reduces by 0.001 units. This means that considering the age of the firm and asset tangibility in the model leads to reduced effect of firm size on firm performance. As much as age and asset tangibility of the firm does not significantly affect the change in firm performance based on Tobin's Q, they may limit the effect of size of the firm on performance.

The study also compared the variance in performance (Tobin's Q) between the firms before and after controlling for age and asset tangibility. Before controlling for the two variables the variance between the firms accounted for by firm size was 6.2% and 2.7% after controlling for the two variables. The margin difference in the variance was therefore 3.5% which is slightly large. This means that eliminating the effect of age and asset tangibility leads to smaller variance between the firms due to firm size. Therefore firm size accounts for small change in Tobin's Q. In addition to the above analysis, it is also shown from the results that the variance within the firms' performance (Tobin's Q) accounted for by firm size increases from 6.8% to 7.1% after controlling for age and asset tangibility. An assessment of individual firm performance while controlling for age and asset tangibility would therefore realize greater variance accounted for by the size of the firm.

An analysis of the behaviour of the firm performance, both based on ROE and Tobin's Q reveals that firm size has an effect on performance. In both cases, firm size positively and significantly accounts for significant variance in performance. This leads to the conclusion that firm size has a positive and significant effect on firm performance and, therefore, as the size of the firm increases, performance of the firm increases. For the case of ROE, the firm profit due to shareholders investment increases significantly larger than the reduction of the cost of replacing the firms' asset to the market value in Tobin's Q. Therefore, firm size has a positive and significant effect on firm performance.

The results therefore, indicate that firm size is a significant positive predictor of performance (ROE), $\beta = 0.097$ (P = 0.019 and Tobin's Q, $\beta = 0.058$ (P = 0.001). These values are

statistically significant since the p-values are less than 0.05. It can be inferred from these values that a unit change in firm size leads to an increase in return on equity and Tobin's Q of firms listed at the Nairobi Securities Exchange of 0.097 and 0.058, respectively. The analysis was to test the null hypothesis (H_O) firm size has no influence on financial performance of non-financial firms listed in the NSE. The study rejects the null hypothesis and accepts the alternative hypothesis (H_A) firm size has influence on financial performance of non-financial firms listed in the NSE. It can thus be concluded that firm size has a positive and significant influence on both the market value of the firm and return on equity, with the predictive ability to increase both values when its units are increased.

In this regard, ROE as a function of firm size gives the most significant results as compared to Tobin's Q. There is no significant variation across the years in firm's performance based on the two measures as opposed to the significant variation in firms' performance across the firms.

These findings agree to some extent and also disagree with other studies. Becker et al., (2010) measure of firms' size in terms of total assets, total sales and number of employees guaranteed a negative non-significant relationship with firms' profitability. Thus Becker et al., (2010) findings contradict the present study that gave a positive relationship between firm size and performance, where firm size was measured as the ratio of sales to total assets. Other studies such as Amato and Burson (2007), Akbas and Karaduman (2012), Jonsson (2007), fail to support the present study on the direction and significance of the relationship. However, findings by Lee (2009), Vijayakumar and Tamizhselvan (2010), and Pervan and Višić (2012) support the present study findings.

Other studies deviate from the present study in terms of the number of the companies used and nature of the firms, for instance, some are financial firms and the variables used are different. This gives a better basis for concluding the relevance of the present study which indicates a positive relationship. It can thus be concluded that firm size has a positive influence on financial performance of non-financial firms listed in the NSE. This implies that the larger the firm, the higher the level of financial performance.

4.3 Moderating Effect of Firm Size on the relationship between Financial Leverage and Financial Performance of non-financial firms listed in the NSE.

The third objective of the study was to assess the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE. The first step entailed categorizing the firms into three groups which included small, medium and large on the basis of the ratio of sales to total assets. Firms whose values lie within the first quartile were considered as small. Similarly, firms whose values lie in fourth quartile are labeled as large firms while remaining second and third quartile are considered as medium sized. These categories were deemed important in carrying out moderation, which is far much recommended for a categorical moderator especially when inco-operating graphical analysis for explanatory purposes. Multiple hierarchical panel regression models were then carried out in two phases for each of the measure of performance.

4.3.1 Moderating Effect of Firm Size on Financial Leverage-Return on Equity (ROE) Relationship

The first model entailed return on assets with first stage seeking the regression without controlling for the effects of age and asset tangibility of the firms. The findings are presented in Table 4.10 below. The model used entailed the financial leverage as the factor variable, firm size as the moderator variable and financial performance as a function of both the moderator and predictor variables.

Table 4.10: Moderating Effect of Firm Size on the relationship between Financial Leverage and Financial Performance using ROE

Fixed-effects (within) regression Group variable: ID				Number of observations = Number of groups =			196 28
R-sq: within	= 0.343			Observations per group: min =			7
Between	= 0.303			F(3,165)		=	28.70
Overall	= 0.305			Prob > F		=	0.000
corr(u_i, Xb)	= -0.338						
ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]		
FS	0.176	.066	2.65	0.009	0.045	0.308	
DER	0.257	0.037	6.84	0.000	0.183	0.331	
FS*DER (interaction)	-0.083	0.024	-3.42	0.001	-0.131	-0.035	
Cons	-0.179	0.086	-2.06	0.041	-0.350	-.007	
Sigma_u	0.149						
Sigma_e	0.189						
Rho	0.383		(fraction of variance due to u_i)				
F test that all	u_i=0:	F(27, 165) = 3.39			Prob > F = 0.000		

Source: Field Data, 2019

The findings in Table 4.10 above indicate that the model explains contribution of 30.5%. (R square overall=0.305) which is significant, F $(3,165)$ = 28.7, Prob > F=0.000. The model main effects indicates that financial leverage had a positive and significant effect on return on equity of the firms, (coefficient=0.257), t (196) =6.84, P>|t|=0.000 as well as the moderator variable, which is the firm size, (coefficient=0.176, t (196) =2.65, P>|t|=0.009). The model coefficient interaction term was, however, negative but significant (coefficient=-0.083, t (196) =-3.42, P>|t|=0.001). The regression coefficient of the product term (firm size× financial leverage) on return on assets is negative, which indicates that the moderating variable (firm size) weakens the causal effect of financial leverage on return on equity. The hypothesis that firm size moderates the relationship between financial leverage and financial performance was therefore supported. As a result, the hypothesized moderation model was therefore confirmed to be;

Y = -0.179 + 0.257 DER + 0.0176 FS - 0.083 (DER x FS) $+ \varepsilon_{it}$**.**

The model implies that a unit change in the interaction will result in -0.083 units in financial performance. This indicates that firm size weakens the causal effect of financial leverage on performance. This therefore implies that an increase in firm size gives negative effects on

return on equity of the firms. Further findings were presented after controlling for other covariates which entail age of the firm and asset tangibility. The findings are presented in Table 4.11 below.

Table 4.11: Moderating Effect of Firm Size on the relationship between Financial Leverage and Financial Performance using ROE while Controlling for Asset Tangibility and Firm Age

Fixed-effects (within) regression			Number of observations		=	196
Group variable: ID			Number of groups		=	28
R-sq: within	= 0.348		Observations per group: min =			7
Between	= 0.037		$F_{(5,163)}$		=	17.40
Overall	= 0.108		Prob > F		=	0.000
corr(u_i, Xb) =	-0.691					
ROE	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.187	0.067	2.79	0.006	0.055	0.322
DER	0.259	0.037	6.86	0.000	0.185	0.334
FS*DER (interaction)	-0.084	0.024	-3.45	0.001	-0.132	-0.036
TANG	0.062	0.086	0.72	0.472	-0.108	0.233
FAGE	-0.006	0.006	-0.93	0.355	- 0.019	0.007
Cons	0.146	0.405	0.36	0.718	-0.654	0.947
Sigma_u	0.257					
Sigma_e	0.190					
Rho	0.647	(fraction of variance due to u_i)				
F test that all	u_i=0:	$F_{(27, 165)}$ =	3.36		Prob > F = 0.0000	

Source: Field Data, 2019

The findings indicate that the model accounts for an overall variance of 10.8% in return on equity (R square overall = 0.108). The overall model was also found to be significant, $F_{(5, 163)}$ =17.40, Prob > F = 0.000. This means that, even after controlling for the effect of firm age and asset tangibility, firm size still significantly moderates the relationship between financial leverage and firm performance based on return on equity. Each of the model coefficients were therefore examined. Starting with firm size, the findings indicate that when all these variables were used in the model, firm size had a positive (coefficient=.187) and significant P>|t|=0.006 effect on return on equity. Financial leverage, which is the main independent variable, also maintained a positive (coefficient=0.259) and significant P>|t|=0.000 effect on return on equity.

An analysis of the interaction term (interaction between firm size and financial leverage) indicates that the term has a negative (coefficient = -0.084) and significant (P>|t|=0.001) effect on return on equity.

The hypothesis that firm size moderates the relationship between financial leverage and financial performance was therefore supported. As a result, the hypothesized moderation model was therefore confirmed to be;

Y = 0.146 + 0.259 DER + 0.187 FS + 0.062 TANG − 0.006 FAGE - 0.084 (DER x FS) + ε_{it}.

The model implies that a unit change in the interaction will result in -0.084 units in financial performance. This implies that an increase in firm size gives negative effects on return on equity of the firms. Precisely, as the size of the firm increases, the effect of financial leverage on return on equity reduces. Therefore, firm size can be said to negatively moderate the relationship between financial leverage and return on equity.

The second measure of financial performance, which is Tobin's Q was also regressed against the model covariates in the moderation analysis. Consequently, firm size was tested to find out if it moderated the relationship between financial leverage and firm performance based on Tobin's Q. The findings are presented in Table 4.12 page 80.

Table 4.12: Moderating Effect of Firm Size on the relationship between Financial Leverage and Financial Performance using Tobin's Q

Fixed-effects (within) regression			Number of observations =			196
Group variable: ID			Number of groups =			28
R-sq: within	= 0.136		Observations per group: min =			7
Between	= 0.122		$F_{(3,165)}$		=	8.65
Overall	= 0.124		Prob > F		=	0.000
corr(u_i, Xb)	= 0.063					
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.126	0.031	4.04	0.000	0.064	0.187
DER	0.073	0.017	4.16	0.000	0.038	0.107
FS*DER (interaction)	-0.037	0.011	-3.25	0.001	-0.059	-0.014
Cons	-0.019	0.041	-0.47	0.639	-0.099	0.061
Sigma_u	0.172					
Sigma_e	0.088					
Rho	0.791	(fraction of variance due to u_i)				
F test that all	u_i=0:	$F_{(27, 165)}$ = 25.55			Prob > F = 0.0000	

Source: Field Data, 2019

The findings in Table 4.12 above indicate that the overall model accounted for an overall variance of 12.4% in financial performance based on (coefficient=0.124). The results also shows that the model is significant, $F_{(3,165)}$ =8.65, Prob > F = 0.000. This means that the model accounts for 12.4% change in return on Tobin's Q and the rest of the variance (87.6%) is accounted for by other variables not included in the model. An examination of each of the model coefficients indicates that firm size had the strongest unique contribution (coefficient=0.126) which was positive and significant P>|t|=0.000 followed by financial leverage (coefficient=0.073) which was also positive and significant P>|t|=0.000. The main aim was to assess the moderating effect of firm size on the relationship between financial leverage and performance. The findings indicate that the coefficient of the interaction term (firm size ×financial leverage) is negative (coefficient = -0.037) and significant P>|t|=0.001.

The hypothesis that firm size moderates the relationship between financial leverage and financial performance was therefore supported. As a result, the hypothesized moderation model was therefore confirmed to be;

Y = -0.019 + 0.073 DER + 0.126 FS - 0.037 (DER x FS) + ε_{it}.

The model implies that a unit change in the interaction will result in -0.037 units in financial performance. This indicates that firm size weakens the causal effect of financial leverage on performance. This therefore means that, as the size of the firm increases, the effect of financial leverage on performance significantly reduces. It can thus be concluded that firm size negatively moderates the relationship between financial leverage and performance of the firms.

Further analysis of the moderating role of firm size on the relationship between financial leverage and firm performance based on Tobin's Q was carried out while controlling for the effect of age and asset tangibility of the firms. The findings are presented in Table 4.13 below.

Table 4.13: Moderating Effect of Firm Size on the relationship between Financial Leverage and Financial Performance using Tobin's Q while Controlling for Asset Tangibility and Firm Age

Fixed-effects (within) regression			Number of observations	=	196	
Group variable: ID			Number of groups	=	28	
R-sq: within	= 0.145		Observations per group: min =		7	
Between	= 0.016		F(5,163)		=	5.54
Overall	= 0.024		Prob > F		=	0.001
corr(u_i, Xb)	= -0.449					
Tobin's Q	Coefficient	Std. Err.	T	P>|t|	[95% Conf. interval]	
FS	0.128	0.032	4.070	0.000	0.066	0.190
DER	0.074	0.018	4.240	0.000	0.039	0.109
FS*DER (interaction)	-0.038	0.011	-3.340	0.001	-0.060	-0.015
TANG	-0.023	0.040	-0.580	0.563	-0.103	0.056
FAGE	-0.004	0.003	-1.15	0.250	-0.010	0 .003
Cons	0.209	0.189	1.110	0.269	-0.163	0.582
Sigma_u	0.205					
Sigma_e	0.088					
Rho	0.843	(fraction of variance due to u_i)				
F test that all	u_i=0:	F(27, 165) = 23.69			Prob > F =	
0.000						

Source: Field Data, 2019

The findings in Table 4.13 above indicate that the overall model accounted for 2.4% change in firm performance after controlling for other covariates which includes the age and asset

tangibility of the firm (R square = 0.024). These findings were positive and significant, F (5,163) = 5.54, Prob > F = 0.0001. Further examination of the model coefficients indicates that firm size had a positive and significant effect on financial leverage (coefficient= 0.128, P>|t|=0.000) as well as financial leverage (coefficient= 0.074, P>|t|=0.000).

The findings further reveal that there was a negative and significant effect of the interaction term (coefficient= -0.038, P>|t|=0.001) on financial performance implying that firm size negatively moderates the relationship between financial leverage and firm performance. A negative interaction coefficient means that the effect of the combined action of two predictors is less than the sum of the individual effects. Thus, the value of the slope/coefficient of financial leverage on financial performance is a function of the value of firm size and the slope/coefficient of firm size on financial performance is a function of financial leverage. Since the moderator is negative, then it implies that the effect of financial leverage on financial performance will decrease as the firm size gets larger, and that the effect of firm size on financial performance will decrease as financial leverage gets larger.

The kind of margin or change seen in Table 4.13 page 82 could have been affected by some categories of firms. Because these categories don't respond the same way to leverage and service, there are firms that operate well when they are large, while others operate well when they are medium or small. Whereas the economies of scale explain a general firm operation, in terms of circumstance and condition of operation and management, firms that are capital intensive operate well when they are large. However, firms that are labour intensive operate very well when they are small and medium.

The variance of the financial performance between the firms was also assessed. The findings indicate that, before controlling for age and asset tangibility of the firms during moderation, the variance between the firms performance accounted for by financial leverage was 12.2%. However, after controlling for asset tangibility and age of the firm, the variance was 1.6%. This implies that there was a great reduction in the variance between the firms, by a margin of 10.6%. This implies that age and asset tangibility have some indirect effect on the financial leverage-firm size and performance relationship when compared between the firms. The hypothesis that firm size moderates the relationship between financial leverage and financial performance was therefore supported. As a result, the hypothesized moderation model was therefore confirmed to be;

Y = 0.209 + 0.074 DER + 0.128 FS - 0.023 TANG − 0.004 FAGE - 0.038 (DER x FS) + ε_{it}**.**

The model implies that a unit change in the interaction will result in -0.038 units in financial performance.

Further graphical analysis was carried out to explain in detail the moderating role of firm size on the relationship between financial leverage and firm performance. The findings on the moderating effect of firm size on the relationship between financial leverage and ROE are presented in Figure 4.6 below.
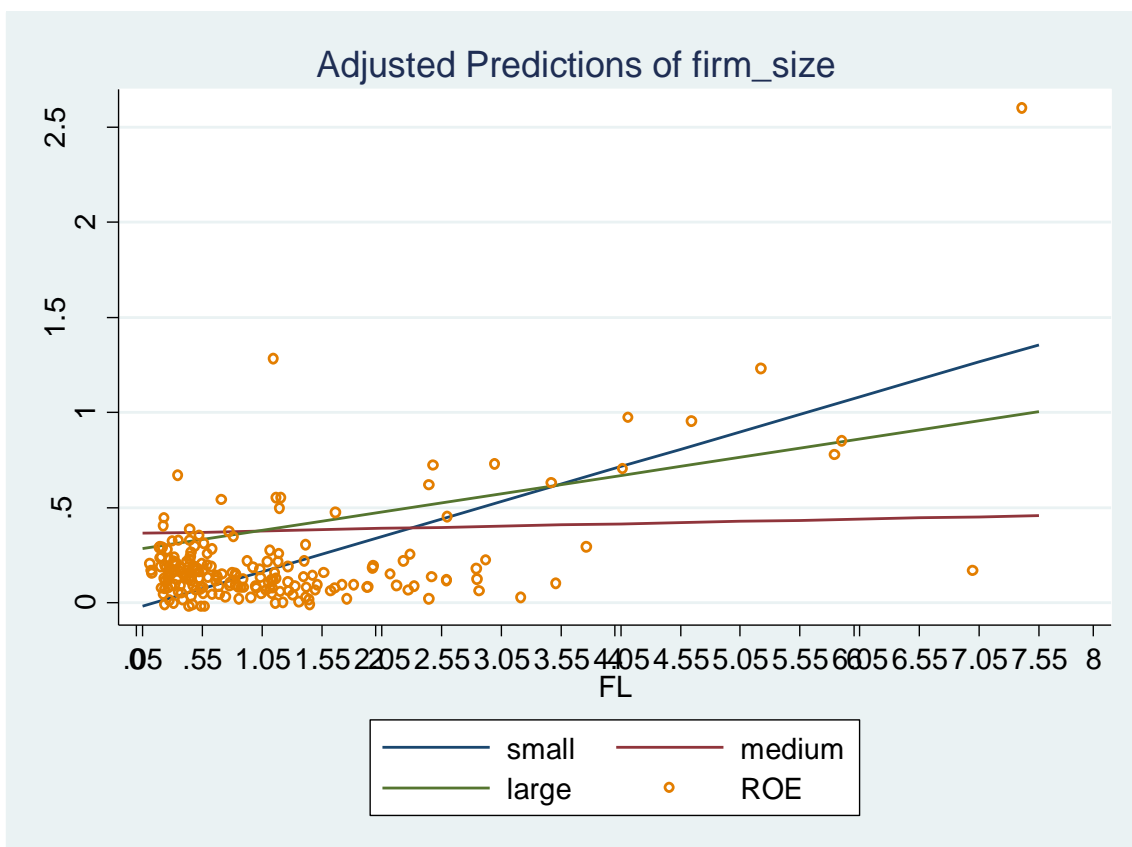
Figure 4.6: Graphical Analysis of Moderation on FL-ROE relationship
Source: Field Data, 2019

The findings in Figure 4.6 above indicate that, for medium firms, the slope remains constant as change in financial leverage increases. However, there is an increase in ROE for smaller firm size as compared to larger firm size. The findings also indicate an interaction in the lines as the financial leverage increases. It can be concluded from these findings that the value of ROE increases with smaller firm size as compared to large firm size while factoring

in financial leverage. Firm size thus negatively moderates the relationship between financial leverage and firm performance.

Further findings on the moderating role of firm size on the relationship between financial leverage and Tobin's Q are presented in Figure 4.7 below.
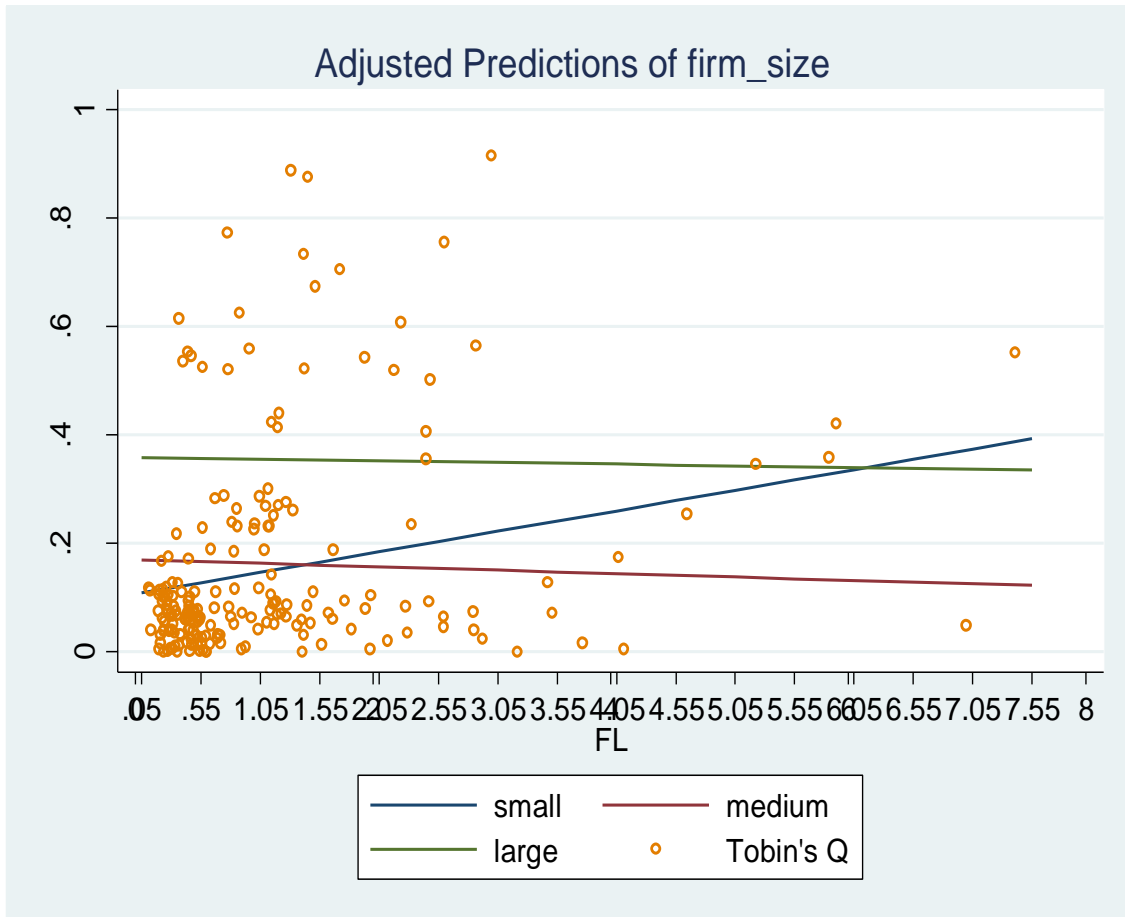
Figure 4.7: Graphical Analysis of Moderation on FL-Tobin's Q relationship
Source: Field Data, 2019

The findings indicate that, as the financial leverage increases, Tobin's Q value for medium firms reduces. This is also observed for the large firms, which shows a decline in the value of Tobin's Q as the financial leverage increases. This explains the reason for persistent poor performance of Mumias Sugar Company, Uchumi supermarkets, and Kenya Airways among others. For the last one decade, these firms have reported losses in terms of billions of shillings (NSE, 2018). However, there is an increase in the value of Tobin's Q for smaller firm size as the financial leverage increases. The findings also show that the value of Tobin's Q is generally low for medium firms as compared to large firms. For smaller firms,

the value of Tobin's Q increases leading to an interaction across the medium and large firms. This implies that firm size moderates the relationship between financial leverage and Tobin's Q negatively thus resulting in negative moderation.

The analysis was to test the null hypothesis (H_O) firm size has no moderating effect on the relationship between financial leverage and financial performance of firms listed in the NSE. The study rejects the null hypothesis and accepts the alternative hypothesis (H_A) firm size has a moderating effect on the relationship between financial leverage and financial performance of firms listed in the NSE. It can therefore be concluded that the change in firm performance reduces with an increase in financial leverage due to change in firm size.

The study results on moderation could have been a pointer to distinguishing firms in terms of category of service. Whereas the current study has these results, the theory of economies of scale asserts that increasing firm size allows for incremental advantages because the size of the firm enables it gain leverage on the economies of scale to attain higher profitability, there seems to be an indicator that was not considered in this study possibly in terms of categories of service. While some are capital intensive, others are labour intensive hence the margin could have been affected by a category of service.

The findings of this study are similar to those of Vithessonthi and Tongurai (2015) who found that the magnitude of the effect of leverage on operating performance is non-monotonic and conditional on firm size. Panel regression results also indicated that leverage has a negative effect on performance across firm size subsamples, the year-by-year cross-sectional regression results show that the effect of leverage on performance is positive for small firms and is negative for large firms.

Other moderating elements such as corporate governance, culture and innovation strategy as indicated by different studies inclusive of La Rocca (2007), Gleason et al., (2000), and Yung-Chieh (2013) indicates moderation. All these studies supports that there is moderation although using different moderators. The study findings are also strongly supported by the economies of scale theory which formed the basic guide. Economies of scale theory prescribes that increasing firm size allows for varied advantages because the size of the firm may enables it gain or lose leverage on the economies of scale to attain higher or lower profitability. As a proof of the theory, there is indeed a strong effect of firm size on the

relationship between financial leverage and firm performance. This also confirms the trade-off theory which permits to make the following predictions. First, a positive relationship between financial leverage and financial performance is expected, since debt enables firms to lower their tax expense and agency problems. Second, company size and leverage are also expected to be positively linked, but firm size may not enhance the financial leverage-firm performance relationship positively. The theory of economy of scale coupled with the signaling and trade off theories, thus support that firm size remains the center player in the financial leverage-performance relationship. Therefore, for the present study, it can be concluded that firm size negatively moderates the relationship between financial leverage and financial performance leading to a reduction in predictive power of financial leverage especially based on ROE as a function of financial leverage.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusion and recommendation of the study. It also presents the limitations and delimitations of the study. Finally, it suggests areas for further research.

5.2 Summary of Findings

The first objective of the study sought to establish the effect of financial leverage on financial performance of non-financial firms listed in the NSE. Using the fixed effects model, the percentage variance in the financial performance explained by financial leverage was higher for ROE as compared to Tobin's Q. In all the cases, financial leverage had a significant effect on financial performance of non-financial firms listed in the NSE.

The second objective of the study sought to determine the influence of firm size on financial performance of non-financial firms listed in the NSE. The variance in firm performance as explained by firm size was significant. Using fixed effects model, the findings on the influence of firm size on financial performance of the firms was significant. A comparison for the effect of firm size on firm performance using return on equity and Tobin's Q revealed that firm size accounted for more variance in Tobin's Q as compared to return on equity.

The last objective of the study was to assess the moderating effect of firm size on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE. The findings revealed that firm size moderated the relationship between financial leverage and firm performance. In this study, firm size moderates the relationship between financial leverage and firm performance negatively leading to a negative moderation.

5.3 Conclusion

Based on the summary of findings presented, three conclusions can be drawn. The first conclusion based on the first objective is that financial leverage has a positive and significant effect on financial performance, which slightly reduces when the confounding factors, such as when we controlled for the age of the firm and asset tangibility. It can thus be concluded that financial leverage has a positive and significant effect on firm performance.

The second recommendation which is based on the second conclusion is that, firms' financial performance varies as the firm size varies. Both measures of performance, which are return on equity and Tobin's Q indicated significant variance due to the effect of firm size. It can thus be concluded that firm size has an influence on financial performance of non-financial firms listed in the NSE. This, however, can be affected by the age of the firm and the asset tangibility of the firms even though the two variables do not have a direct effect on firm performance. It is also clear that large firms have bigger assets and therefore explain greater variance in financial performance. The theory of economies of scale which prescribes that increasing firm size allows for incremental advantages is therefore confirmed.

Finally, the findings revealed that, even though financial leverage has an effect on financial performance of non-financial firms listed in the NSE, firm size alters the relationship. Since the size of the firm moderates the relationship between financial leverage and the financial performance, the null hypothesis that firm size has no moderating effect on the relationship between financial leverage and financial performance of non-financial firms listed in the NSE was rejected. It can thus be concluded that firm size moderates this relationship and the moderation is negative. Therefore, it can be concluded that firm size negatively moderates the relationship between financial leverage and firm performance.

In terms of policy, the study established that data was constant with no large variation over the years hence ROE was a suitable measure. Whereas scholars have previously used ROE for a single period measure and characterized with merchandised form of business, where data is constant, ROE becomes a suitable measure just like it measures a single period.

5.4 Recommendations of the Study

On the basis of the first conclusion, it is recommended that management of the non-financial firms listed at the NSE can use financial leverage to improve financial performance since financial leverage has a positive and significant effect on firm financial performance. Therefore, an appropriate debt- equity mix should be adopted by non-financial firms if they must improve their financial performance, survive and remain competitive.

Based on the second conclusion, it is recommended that management of the non-financial firms listed at the NSE should consider increasing firm size to exploit the incremental advantages associated with large sized firms as supported by the economies of scale theory.

Based on the third conclusion, it is recommended that management of the non-financial firms listed at the NSE should take into consideration the size of their firms in making leverage choices since firm size moderates this relationship negatively.

5.5 Limitations of the Study

A number of limitations were identified while conducting this study. First, the study limited its investigation to listed non-financial firms only. Therefore, the study excluded unlisted non-financial firms because their financial statements are not audited and prepared according to IAS 1 but represents a bigger proportion. The study cannot therefore be generalized to all non-financial firms in the Kenyan economy.

Second, the study used purposive sampling technique and was restricted to listed non-financial firms only which excluded listed financial firms and unlisted firms which equally contribute significantly to the Kenyan economy. This may have compromised the general applicability to the Kenyan and global business environments.

Third, the study relied on secondary data collected from the individual firms' financial statements filed with the Nairobi Securities Exchange and Capital Markets Authorities. The data is assumed to be reliable having been prepared following the laid down GAAPs. However, different firms use different accounting policies such as methods of depreciation. In line with theory and previous studies, the variables of the study were then standardized using financial ratio analysis technique to remove this weakness.

Lastly, the study was restricted to seven years' period ranging from January 2012 to December 2018 in terms of data collection. The analysis period is relatively short though consistent with Lai (2010) who asserted that at least 20 firms in any sector in a year are adequate to provide sufficient observations for estimation purposes.

5.6 Suggestion for Further Research

From the limitations above, this study has come up with the following suggestions for further research: first, other moderator variables should be the focus of further conceptual research to establish the nature and strengths of their interrelationships.

Second, it is also suggested to academicians to conduct similar studies in other contexts and apply other research designs and different analytical tools to find out whether the findings of this study will still hold or shed more light for the firms on the relationship that exist between leverage and performance.

Third, future studies should include listed financial firms in the NSE using longer longitudinal study to compare results across panel groups.

Lastly, a study should be undertaken to compare the financing decisions of non-financial companies listed on the NSE and those not listed and the effects of these decisions on performance. In addition, future studies could be extended to analyze financial decisions and their effect on performance across other countries especially those in the East African Community.

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APPENDICES

Appendix I: Authority to Conduct Research (NACOSTI)
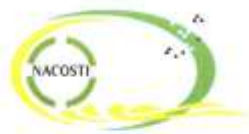
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Ref. No **NACOSTI/P/18/97797/26737**   Date **12ᵗʰ December, 2018**

Daniel Wilkins Wayonga
Maseno University
Private Bag
MASENO.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"Analysis of firm size, financial leverage and financial performance of non financial firms in Nairobi Securities Exchange, Kenya"* I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **12ᵗʰ December, 2019.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nairobi County

The County Director of Education
Nairobi County

Appendix II: Data Collection Sheet

Name of Firm   …………………………………………………………..

YR	YEARS ARTER INCORP	TOTAL DEBT	TOTAL EQUITIES	TOTAL ASSETS	NON CURRENT ASSETS	INTANGIBLE ASSETS	EBT	EAT	SHARE CAPITAL	SALES
2010										
2011										
2012										
2013										
2014										
2015										
2016										

Appendix III: List of NSE Listed Companies as at 31st December 2018

	COMPANY NAME	Listing by Date	Suspended/Delisted between 2012 &2018	Included in the sample
	FINANCIAL FIRMS			
	BANKING			
1	CFC Stanbic of Kenya Holdings	1970		
2	Diamond Trust Bank Kenya Ltd	1972		
3	Barclays Bank of Kenya	1986		
4	Standard Chartered Bank Kenya	1988		
5	Kenya Commercial Bank Group	1989		
6	NIC Group	1991		
7	Housing Finance Group	1992		
8	National Bank of Kenya	1994		
9	Equity Group Holdings	2006		
10	Co-operative Bank of Kenya	2008		
11	I&M Holdings	2013		
	INSURANCE			
12	Sanlam Kenya Ltd	1963		
13	Jubilee Holdings	1984		
14	Kenya Re-Insurance Corporation	2006		
15	Liberty Kenya Holdings	2007		
16	Britam Holdings	2011		
17	CIC Insurance Group	2012		
	NON FINANCIAL FIRMS			
	AGRICULTURAL			
18	Kakuzi	1951	×	
19	Limuru Tea	1967		✓
20	Sasini	1965		✓
21	Williamson Tea Kenya	1972		✓
22	Eaagads	1972	×	
23	Kapchorua Tea Kenya	1972		✓
	CONSTRUCTION & ALLIED			
24	Bamburi Cement Ltd	1970		✓
25	E.A Portland Cement Ltd	1972		✓
26	E.A. Cables Ltd	1973		✓
27	Crown Paints Ltd	1992		✓
28	Athi River Mining Ltd	1997	×	
	COMMERCIAL AND SERVICES			
29	Standard Group Ltd	1954		✓
30	Nation Media Group Ltd	1973		✓
31	Express Kenya Ltd	1978		✓

32	Uchumi Super Markets Ltd	1992		✓
33	Sameer Africa	1994		✓
34	Kenya Airways Ltd	1996		✓
35	TPS Eastern Africa (Serena) Ltd	1997	×	
36	WPP Scangroup Ltd	2006		✓
37	Eveready East Africa	2006	×	
38	Lonsghorn publishers Ltd	2012		✓
39	Atlas African Industries Ltd	2014	×	
40	Deacons (East Africa)	2016	×	
41	Nairobi business venture Ltd	2016		
TELECOMMUNICATION & TECHNOLOGY				
38	Safaricom	2008		✓
INVESTMENT				
39	Olympia Capital Holdings	1974		✓
40	Centum Investment Co. Ltd	1977		✓
41	Trans Century Ltd	2011		✓
42	Home Afrika Ltd	2013		
43	Kurwitu Ventures	2014		
INVESTMENT SERVICES				
44	Nairobi Securities Exchange	2014		
45	Stanlib Fahari I-REIT	2015		
46	Barclays New Gold ETF	2017		
MANUFACTURING AND ALLIED				
47	Kenya Orchards	1959	×	
48	B.O.C. Kenya Ltd	1969	×	
49	B.A.T Kenya Ltd	1969		✓
50	Unga Group	1971	×	
51	East African Breweries Ltd	1972		✓
52	Carbacid Investments Ltd	1972		✓
53	Mumias Sugar Ltd	2001		✓
54	Flame Tree Group Holdings Ltd	2015		
AUTOMOMOBILES & ACCESSORIES				
55	Car and General (K) Ltd	1950		✓
ENERGY AND PETROLEUM				
56	KenolKobil	1959	×	
57	Kenya Power & Lighting	1972		✓
58	Total Kenya	1988	×	
59	KenGen Company	2006		✓
60	Umeme Ltd	2012		✓

Source: (CMA, 2018)

Appendix IV: Map of Study Area

Source: Google Maps, 2018

Appendix V: Correlation matrix of coefficients of regression model

e(V)	FL	2013. year	.2014. year	2015. year	2016. year	2017. year	2018. year	2. ID	3. ID	4. ID	5. ID	6. ID
FL	1.0000											
2013.year	0.4607	1.0000										
2014.year	0.4513	0.6355	1.0000									
2015.year	0.4491	0.6119	0.6865	1.0000								
2016.year	0.4563	0.6209	0.6977	0.7345	1.0000							
2017.year	0.4547	0.6150	0.6924	0.7038	0.7155	1.0000						
2018.year	0.4726	0.6081	0.6745	0.7139	0.7147	0.7270	1.0000					
2.ID	0.0585	-0.1853	-0.2105	-0.2420	-0.2075	-0.1688	-0.1893	1.0000				
3.ID	0.2773	-0.0426	-0.1151	-0.1415	-0.1413	-0.1387	-0.1177	0.1654	1.0000			
4.ID	0.1008	0.0513	0.0141	-0.1490	-0.0767	-0.0201	-0.0769	0.0696	0.1365	1.0000		
5.ID	0.1476	0.0423	0.0778	-0.0937	-0.0301	0.0235	-0.0691	0.0688	0.1575	0.1069	1.0000	
6.ID	0.4881	0.0659	-0.0170	0.0179	0.0035	0.0044	0.0908	0.1677	0.4454	0.1321	0.1578	1.0000
7.ID	0.2486	-0.0333	-0.1217	-0.1027	-0.0761	-0.1019	-0.0635	0.1465	0.3214	0.1054	0.1208	0.4046
8.ID	0.2220	-0.0137	-0.0743	-0.0746	-0.0560	-0.0710	-0.1382	0.1245	0.2947	0.1054	0.1300	0.3276
9.ID	0.2638	-0.0292	-0.0720	-0.1015	-0.0957	-0.1443	-0.1396	0.1407	0.3608	0.1211	0.1445	0.3803
10.ID	0.2774	-0.0584	-0.0971	-0.1286	-0.1184	-0.1506	-0.1097	0.1553	0.3604	0.1237	0.1420	0.4050
11.ID	0.1010	-0.1141	-0.2535	-0.2628	-0.2539	-0.2277	-0.2182	0.1474	0.2385	0.0986	0.0890	0.2431
12.ID	0.1625	-0.0334	-0.0781	-0.0653	-0.0561	-0.0759	-0.0790	0.0985	0.2357	0.0712	0.0880	0.2642
13.ID	0.2863	-0.0899	-0.1168	-0.0972	-0.0962	-0.1228	-0.0830	0.1570	0.4083	0.1144	0.1368	0.4388
14.ID	0.4146	0.0119	0.0167	0.0014	0.0048	0.0438	0.0636	0.1533	0.4238	0.1260	0.1616	0.5031
15.ID	0.2197	-0.0836	-0.1425	-0.1549	-0.2086	-0.2123	-0.1880	0.1477	0.3034	0.1047	0.1160	0.3213
16.ID	0.2115	-0.0619	-0.1770	-0.1653	-0.1634	-0.3207	-0.1596	0.1658	0.3726	0.1171	0.1271	0.4474
17.ID	0.3961	-0.0126	-0.0646	-0.0624	-0.0560	-0.0558	0.0398	0.1691	0.4065	0.1247	0.1447	0.5106
18.ID	0.7055	0.2157	0.1259	0.1272	0.1357	0.1409	0.1714	0.1666	0.4427	0.1530	0.1881	0.5941
19.ID	0.3835	-0.0166	-0.0827	-0.0680	-0.0596	-0.0669	-0.0285	0.1772	0.4170	0.1331	0.1594	0.5211
20.ID	0.0252	-0.0909	-0.1086	-0.2165	-0.2440	-0.1703	-0.1904	0.0924	0.1381	0.0852	0.0811	0.1127
21.ID	0.2867	-0.0750	-0.1875	-0.2147	-0.2222	-0.2258	-0.2200	0.1930	0.3950	0.1475	0.1596	0.4278
22.ID	0.3967	-0.0154	-0.1354	-0.1547	-0.1402	-0.1375	-0.0889	0.1968	0.4252	0.1540	0.1659	0.4992

23.ID 0.3338 -0.0256   -0.1154 -0.1485 -0.1491 -0.1619 -0.1297 0.1705 0.3560 0.1336 0.1454
       0.4055

24.ID 0.1148 -0.0092   -0.0987 0.0003   -0.0474 -0.0075 -0.0215 0.0613 0.1318 0.0252 0.0296
       0.1681

25.ID 0.4002 -0.0405   -0.0549 -0.0520 -0.0749 -0.0708 -0.0522 0.1622 0.3728 0.1208 0.1452
       0.4438

26.ID 0.1623 0.0183   -0.0088 -0.0985 -0.0670 -0.0157 0.0495 0.0813 0.1711 0.0838 0.0815
       0.2210

27.ID 0.2045 0.0295   0.0533 0.1448 0.1041 0.0634 0.0790 0.0335 0.1697 0.0114 0.0399
       0.2175

28.ID 0.1062 -0.1309   -0.1504 -0.2195 -0.1980 -0.2625 -0.2346 0.1268 0.2322 0.0912 0.0983
       0.2209

2013.year#
c.FL -0.5750 -0.8250   -0.5655 -0.5464 -0.5523 -0.5531 -0.5462 0.1199 0.0687 -0.0276 -0.0308 -
0.0640

2014.year#
c.FL -0.6618 -0.6022   -0.7966 -0.6485 -0.6508 -0.6521 -0.6426 0.1343 0.1395 0.0059 -0.0390 -
0.0366

2015.year#
c.FL -0.6558 -0.5903   -0.6520 -0.8049 -0.6739 -0.6634 -0.6661 0.1513 0.1749 0.0769 0.0393 -
0.0470

2016.year#
c.FL -0.6664 -0.5889   -0.6517 -0.6711 -0.8045 -0.6720 -0.6685 0.1344 0.1195 0.0442 0.0087 -
0.0465

2017.year#
c.FL -0.6081 -0.5395   -0.6212 -0.6217 -0.6270 -0.8155 -0.6508 0.1188 0.1183 0.0227 -0.0119 -
0.0173

2018.year#
c.FL -0.6147 -0.5545   -0.6259 -0.6466 -0.6458 -0.6769 -0.8159 0.1325 0.1164 0.0521 0.0380 -
0.0509

2.ID#c.FL 0.0379 0.1854   0.1913 0.2224 0.1870 0.1463 0.1768 -0.9740 -0.0463 -0.0313 -
0.0235 -0.0281

3.ID#c.FL -0.3826 0.0353   0.0868 0.1194 0.0999 0.0983 0.0860 -0.1444 -0.8882 -0.1202 -
0.1393 -0.3889

4.ID#c.FL -0.0173 -0.0570   -0.0356 0.1301 0.0565 -0.0021 0.0636 -0.0279 -0.0359 -0.9821 -
0.0697 -0.0136

5.ID#c.FL -0.0245 -0.0493   -0.1092 0.0669 0.0015 -0.0552 0.0515 -0.0097 -0.0160 -0.0627 -
0.9658 0.0097

6.ID#c.FL -0.2489 -0.1293   -0.0957 -0.1602 -0.1346 -0.1384 -0.2296 -0.0038 -0.0791 -0.0039 -
0.0089 -0.6748

7.ID#c.FL -0.2679 0.0207   0.0913 0.0723 0.0458 0.0866 0.0537 -0.1085 -0.2225 -0.0760 -
0.0877 -0.3030

8.ID#c.FL -0.1775 0.0022   0.0356 0.0346 0.0150 0.0358 0.1167 -0.0687 -0.1591 -0.0623 -
0.0809 -0.1747

9.ID#c.FL -0.2279 0.0169   0.0259 0.0530 0.0460 0.0984 0.1089 -0.0785 -0.2156 -0.0732 -
0.0902 -0.2125

10.ID#c.FL -0.3917 0.0423   0.0438 0.0702 0.0680 0.0899 0.0584 -0.1288 -0.2947 -0.1019 -
0.1208 -0.3491

11.ID#c.FL 0.0420 0.1140   0.2347 0.2425 0.2336 0.2041 0.2074 -0.0818 -0.0722 -0.0459 -
0.0251 -0.0460

12.ID#c.FL -0.1659 0.0202   0.0449 0.0321 0.0245 0.0440 0.0548 -0.0626 -0.1489 -0.0438 -
0.0572 -0.1704

13.ID#c.FL -0.4604 0.0984 0.0942 0.0689 0.0585 0.0786 0.0477 -0.1559 -0.3935 -0.1077 -0.1328 -0.4389

14.ID#c.FL -0.6066 0.0109 0.0649 0.0884 0.0800 0.0585 0.0400 -0.1976 -0.4871 -0.1599 -0.1916 -0.5712

15.ID#c.FL -0.0763 0.0768 0.1021 0.1134 0.1748 0.1777 0.1684 -0.0660 -0.1021 -0.0397 -0.0396 -0.0845

16.ID#c.FL -0.4045 0.0448 0.1459 0.1427 0.1392 0.3139 0.1546 -0.1716 -0.3812 -0.1239 -0.1382 -0.4733

17.ID#c.FL -0.1713 -0.0037 -0.0062 -0.0147 -0.0223 -0.0236 -0.1201 -0.0384 -0.0924 -0.0195 -0.0208 -0.1588

18.ID#c.FL -0.9505 -0.4088 -0.3873 -0.3874 -0.3961 -0.3971 -0.4134 -0.0708 -0.2669 -0.0992 -0.1405 -0.4642

19.ID#c.FL -0.3830 0.0076 0.0546 0.0396 0.0290 0.0644 0.0347 -0.1264 -0.2829 -0.0932 -0.1141 -0.3800

20.ID#c.FL 0.0416 0.0885 0.0926 0.2017 0.2300 0.1544 0.1811 -0.0589 -0.0562 -0.0592 -0.0503 -0.0161

21.ID#c.FL -0.0686 0.0717 0.1517 0.1825 0.1936 0.1954 0.2175 -0.0849 -0.1167 -0.0624 -0.0563 -0.0954

22.ID#c.FL -0.3390 -0.0240 0.0541 0.0746 0.0558 0.0517 0.0167 -0.1049 -0.1938 -0.0835 -0.0830 -0.2499

23.ID#c.FL -0.2312 -0.0016 0.0516 0.0876 0.0885 0.1026 0.0861 -0.0828 -0.1387 -0.0663 -0.0664 -0.1596

24.ID#c.FL -0.0866 0.0021 0.0790 -0.0220 0.0259 -0.0130 0.0064 -0.0326 -0.0625 -0.0025 -0.0037 -0.0905

25.ID#c.FL -0.4831 0.0147 -0.0352 -0.0401 -0.0205 -0.0236 -0.0309 -0.1096 -0.2500 -0.0786 -0.1031 -0.3262

26.ID#c.FL -0.0750 -0.0262 -0.0198 0.0721 0.0395 -0.0139 -0.0721 -0.0308 -0.0490 -0.0452 -0.0358 -0.0806

27.ID#c.FL -0.1040 -0.0384 -0.0881 -0.1850 -0.1424 -0.1001 -0.1052 0.0272 -0.0284 0.0366 0.0151 -0.0538

28.ID#c.FL 0.0278 0.1307 0.1223 0.1942 0.1718 0.2398 0.2232 -0.0611 -0.0700 -0.0393 -0.0369 -0.0281

_cons -0.7907 -0.3640 -0.3046 -0.3055 -0.3112 -0.3034 -0.3444 -0.1297 -0.5147 -0.1653 -0.2190 -0.7019

e(V)	7. ID	8. ID	9. ID	10. ID	11. ID	12. ID	13. ID	14. ID	15. ID	16. ID	17. ID	18. ID
7.ID	1.0000											
8.ID	0.2730	1.0000										
9.ID	0.2775	0.2677	1.0000									
10.ID	0.2922	0.2723	0.3306	1.0000								
11.ID	0.2017	0.1737	0.2050	0.2201	1.0000							
12.ID	0.2058	0.1954	0.2113	0.2396	0.1369	1.0000						
13.ID	0.2989	0.2783	0.3575	0.3691	0.2209	0.2232	1.0000					
14.ID	0.3472	0.3029	0.3537	0.3784	0.2067	0.2615	0.4119	1.0000				
15.ID	0.2384	0.2213	0.2742	0.2814	0.2094	0.1731	0.2883	0.2829	1.0000			
16.ID	0.4262	0.3332	0.3350	0.3372	0.2473	0.2284	0.3368	0.3521	0.3042	1.0000		
17.ID	0.3754	0.2938	0.3440	0.3702	0.2335	0.2389	0.3991	0.4529	0.2959	0.4177	1.0000	
18.ID	0.3813	0.3354	0.3949	0.4139	0.2417	0.2635	0.4315	0.5224	0.3444	0.3998	0.5162	1.0000

19.ID   0.4139   0.3327   0.3602   0.3755   0.2437   0.2507   0.4007   0.4567   0.3078   0.4816   0.4771   0.5193

20.ID   0.0937   0.0924   0.1226   0.1256   0.1237   0.0657   0.1179   0.1024   0.1361   0.1287   0.1148   0.1159

21.ID   0.3294   0.2992   0.3532   0.3660   0.2724   0.2318   0.3748   0.3779   0.3292   0.4017   0.3944   0.4505

22.ID   0.3613   0.3121   0.3723   0.3978   0.2788   0.2470   0.4167   0.4380   0.3386   0.4158   0.4556   0.5357

23.ID   0.2923   0.2636   0.3209   0.3367   0.2416   0.2065   0.3440   0.3542   0.3011   0.3507   0.3697   0.4517

24.ID   0.1420   0.1137   0.0980   0.1025   0.0864   0.0782   0.1162   0.1395   0.0972   0.1716   0.1492   0.1643

25.ID   0.2925   0.2730   0.3365   0.3634   0.2246   0.2121   0.3984   0.3979   0.3006   0.3234   0.3986   0.4894

26.ID   0.1647   0.1105   0.1366   0.1538   0.1115   0.0876   0.1599   0.1912   0.1226   0.1771   0.2109   0.2178

27.ID   0.1482   0.1325   0.1445   0.1452   0.0506   0.1109   0.1720   0.2075   0.1035   0.1607   0.1859   0.2234

28.ID   0.1800   0.1725   0.2192   0.2231   0.1720   0.1359   0.2198   0.1974   0.2104   0.2491   0.2122   0.2288

2013.year#
c.FL   0.0339   0.0290   0.0488   0.0861   0.0884   0.0319   0.1567   -0.0106   0.0441   0.0702   0.0052   -0.3071

2014.year#
c.FL   0.0960   0.0688   0.0949   0.0836   0.1678   0.0672   0.1499   -0.0129   0.0761   0.1698   0.0212   -0.2898

2015.year#
c.FL   0.0991   0.0774   0.0868   0.0856   0.1771   0.0729   0.1132   0.0098   0.0863   0.1817   0.0263   -0.2867

2016.year#
c.FL   0.0999   0.0799   0.0800   0.1175   0.1702   0.1144   0.0856   0.0000   0.1041   0.1870   0.0178   -0.2982

2017.year#
c.FL   0.1735   0.1153   0.1010   0.0930   0.1641   0.0717   0.0874   -0.0443   0.1177   0.4274   0.0429   -0.2634

2018.year#
c.FL   0.1448   0.1209   0.1063   0.0779   0.1655   0.0688   0.0759   -0.0393   0.1116   0.2416   0.0128   -0.2782

2.ID#c.FL   -0.0432   -0.0350   -0.0372   -0.0472   -0.0796   -0.0271   -0.0414   -0.0267   -0.0599   -0.0468   -0.0426   -0.0230

3.ID#c.FL   -0.2667   -0.2481   -0.3139   -0.3098   -0.2056   -0.1934   -0.3653   -0.3719   -0.2629   -0.2967   -0.3542   -0.3970

4.ID#c.FL   -0.0176   -0.0297   -0.0337   -0.0320   -0.0402   -0.0107   -0.0164   -0.0189   -0.0295   -0.0161   -0.0171   -0.0310

5.ID#c.FL   0.0032   -0.0236   -0.0215   -0.0127   -0.0061   -0.0031   0.0014   -0.0111   -0.0098   0.0155   0.0074   -0.0152

6.ID#c.FL   -0.1005   -0.0475   -0.0566   -0.0687   -0.0189   -0.0426   -0.0851   -0.1322   -0.0398   -0.0875   -0.1435   -0.1780

7.ID#c.FL   -0.9218   -0.2095   -0.1972   -0.2070   -0.1492   -0.1472   -0.2026   -0.2449   -0.1742   -0.3574   -0.2833   -0.2799

8.ID#c.FL   -0.1601   -0.9301   -0.1530   -0.1526   -0.0951   -0.1155   -0.1491   -0.1618   -0.1238   -0.2075   -0.1537   -0.1828

9.ID#c.FL -0.1428 -0.1558   -0.9058 -0.2016 -0.1176 -0.1209 -0.2248 -0.2018 -0.1678 -0.1744 - 0.1895 -0.2315

10.ID#c.FL -0.2337 -0.2236   -0.2794 -0.9048 -0.1797 -0.2009 -0.3199 -0.3257 -0.2394 -0.2532 - 0.3161 -0.3751

11.ID#c.FL -0.0564 -0.0479   -0.0602 -0.0689 -0.9482 -0.0368 -0.0587 -0.0271 -0.0877 -0.0814 - 0.0552 -0.0382

12.ID#c.FL -0.1325 -0.1325   -0.1382 -0.1654 -0.0864 -0.9580 -0.1411 -0.1751 -0.1119 -0.1408 - 0.1524 -0.1740

13.ID#c.FL -0.2842 -0.2645   -0.3467 -0.3619 -0.2116 -0.2075 -0.8766 -0.4092 -0.2805 -0.3000 - 0.3982 -0.4463

14.ID#c.FL -0.4191 -0.3599   -0.4157 -0.4374 -0.2734 -0.2918 -0.4665 -0.7937 -0.3525 -0.4554 - 0.5200 -0.5892

15.ID#c.FL -0.0589 -0.0683   -0.1012 -0.0993 -0.0951 -0.0504 -0.0934 -0.0668 -0.9120 -0.0997 - 0.0802 -0.1068

16.ID#c.FL -0.4403 -0.3451   -0.3511 -0.3529 -0.2560 -0.2294 -0.3506 -0.3655 -0.3244 -0.8820 - 0.4396 -0.4446

17.ID#c.FL -0.1152 -0.0538   -0.0677 -0.0834 -0.0493 -0.0485 -0.0949 -0.1288 -0.0593 -0.1126 - 0.7680 -0.1473

18.ID#c.FL -0.2362 -0.2119   -0.2549 -0.2696 -0.1127 -0.1558 -0.2748 -0.3912 -0.2224 -0.2018 - 0.3787 -0.7824

19.ID#c.FL -0.3297 -0.2492   -0.2510 -0.2554 -0.1741 -0.1688 -0.2661 -0.3120 -0.2204 -0.4031 - 0.3509 -0.3704

20.ID#c.FL -0.0219 -0.0305   -0.0515 -0.0510 -0.0766 -0.0162 -0.0383 -0.0149 -0.0756 -0.0465 - 0.0272 -0.0165

21.ID#c.FL -0.0812 -0.0896   -0.1150 -0.1156 -0.1214 -0.0629 -0.1039 -0.0736 -0.1328 -0.1210 - 0.0925 -0.1164

22.ID#c.FL -0.1583 -0.1371   -0.1769 -0.1981 -0.1493 -0.1037 -0.2034 -0.2035 -0.1782 -0.1719 - 0.2256 -0.3069

23.ID#c.FL -0.0990 -0.0992   -0.1365 -0.1444 -0.1188 -0.0734 -0.1372 -0.1268 -0.1484 -0.1254 - 0.1438 -0.2179

24.ID#c.FL -0.0836 -0.0627   -0.0383 -0.0399 -0.0460 -0.0359 -0.0497 -0.0676 -0.0469 -0.1043 - 0.0782 -0.0872

25.ID#c.FL -0.1810 -0.1796   -0.2355 -0.2626 -0.1457 -0.1322 -0.2988 -0.2876 -0.2150 -0.1778 - 0.2869 -0.3966

26.ID#c.FL -0.0600 -0.0182   -0.0304 -0.0429 -0.0407 -0.0135 -0.0417 -0.0629 -0.0318 -0.0560 - 0.0835 -0.0735

27.ID#c.FL -0.0255 -0.0264   -0.0216 -0.0160 0.0342 -0.0263 -0.0353 -0.0594 0.0028 -0.0190 - 0.0364 -0.0551

28.ID#c.FL -0.0369 -0.0499   -0.0795 -0.0763 -0.0795 -0.0384 -0.0623 -0.0226 -0.0921 -0.0870 - 0.0375 -0.0310

_cons -0.4605 -0.3982 -0.4514 -0.4686 -0.2142 -0.3101 -0.5092 -0.6321 -0.3429 -0.4820 -0.6033 - 0.8005

| | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. | 27. | 2011. 28. | 2012. year# | year# |
e(V)	ID	ID	ID	ID	ID	ID	ID	ID	ID	ID	c.FL	c.FL
19.ID	1.0000											
20.ID	0.1191	1.0000										
21.ID	0.4155	0.1657	1.0000									
22.ID	0.4649	0.1551	0.4433	1.0000								
23.ID	0.3793	0.1451	0.3847	0.4149	1.0000							

24.ID 0.1690   0.0295   0.1325   0.1479   0.1168   1.0000
25.ID 0.4005   0.1260   0.3843   0.4341   0.3673   0.1245   1.0000
26.ID 0.2068   0.0716   0.1696   0.2032   0.1610   0.0540   0.1624   1.0000
27.ID 0.1964   0.0013   0.1347   0.1607   0.1272   0.0710   0.1618   0.0503   1.0000
28.ID 0.2244   0.1184   0.2610   0.2554   0.2338   0.0567   0.2206   0.0893   0.0615   1.0000

2013.year#
c.FL 0.0137   0.0713   0.0511   0.0014   -0.0147   -0.0001   0.0556   -0.0102   -0.0240   0.0949   1.0000

2014.year#
c.FL 0.0476   0.0965   0.1114   0.0370   0.0175   0.0322   -0.0301   0.0073   -0.0446   0.1170   0.7470
       1.0000

2015.year#
c.FL 0.0503   0.1420   0.1297   0.0515   0.0358   0.0209   -0.0289   0.0440   -0.0698   0.1480   0.7280
       0.8580

2016.year#
c.FL 0.0439   0.1521   0.1291   0.0381   0.0318   0.0225   -0.0304   0.0287   -0.0637   0.1376   0.7219
       0.8498

2017.year#
c.FL 0.1087   0.1191   0.1482   0.0560   0.0553   0.0489   -0.0255   0.0207   -0.0388   0.1731   0.6583
       0.7966

2018.year#
c.FL 0.0914   0.1342   0.1527   0.0387   0.0449   0.0295   -0.0264   0.0032   -0.0484   0.1653   0.6756
       0.8090

2.ID#c.FL -0.0456   -0.0567   -0.0771   -0.0681   -0.0636   -0.0198   -0.0483   -0.0278   0.0193   -0.0619 -
0.1174   -0.1215

3.ID#c.FL -0.3571   -0.1184   -0.3420   -0.3742   -0.3128   -0.1118   -0.3377   -0.1496   -0.1479   -0.2001 -
0.0598   -0.0979

4.ID#c.FL -0.0212   -0.0548   -0.0486   -0.0444   -0.0424   0.0107   -0.0236   -0.0388   0.0333   -0.0355
       0.0321   0.0062

5.ID#c.FL -0.0014   -0.0382   -0.0198   -0.0106   -0.0163   0.0212   -0.0074   -0.0176   0.0228   -0.0198
       0.0362   0.0552

6.ID#c.FL -0.1348   0.0177   -0.0599   -0.1058   -0.0711   -0.0476   -0.0957   -0.0678   -0.0733   -0.0008
       0.1189   0.1232

7.ID#c.FL -0.3245   -0.0652   -0.2446   -0.2661   -0.2149   -0.1143   -0.2088   -0.1254   -0.1094   -0.1330 -
0.0168   -0.0575

8.ID#c.FL -0.1892   -0.0499   -0.1704   -0.1701   -0.1463   -0.0692   -0.1512   -0.0491   -0.0769   -0.0998 -
0.0174   -0.0326

9.ID#c.FL -0.1961   -0.0760   -0.2109   -0.2176   -0.1934   -0.0427   -0.2085   -0.0687   -0.0835   -0.1392 -
0.0377   -0.0560

10.ID#c.FL -0.3128   -0.1025   -0.3083   -0.3438   -0.2918   -0.0800   -0.3323   -0.1294   -0.1257   -0.1859 -
0.0650   -0.0080

11.ID#c.FL -0.0580   -0.0756   -0.1116   -0.0992   -0.0928   -0.0283   -0.0646   -0.0366   0.0255   -0.0825 -
0.0866   -0.1568

12.ID#c.FL -0.1598   -0.0383   -0.1504   -0.1592   -0.1340   -0.0488   -0.1384   -0.0502   -0.0765   -0.0889 -
0.0151   -0.0290

13.ID#c.FL -0.3936   -0.1090   -0.3644   -0.4162   -0.3419   -0.1130   -0.4152   -0.1587   -0.1723   -0.2095 -
0.1603   -0.0982

14.ID#c.FL -0.5375   -0.1456   -0.4682   -0.5232   -0.4320   -0.1674   -0.4630   -0.2243   -0.2157   -0.2587 -
0.0093   -0.0344

15.ID#c.FL -0.0821   -0.0779   -0.1356   -0.1228   -0.1242   -0.0254   -0.1125   -0.0301   -0.0140   -0.1036 -
0.0301   -0.0410

16.ID#c.FL -0.5054   -0.1349   -0.4249   -0.4434   -0.3779   -0.1759   -0.3579   -0.1852   -0.1687   -0.2642 -
0.0438   -0.1073

17.ID#c.FL -0.1442 -0.0124   -0.0843 -0.1191 -0.0858 -0.0424 -0.0987 -0.0809 -0.0539 -0.0332
        0.0124   0.0277
18.ID#c.FL -0.3649 -0.0355   -0.2872 -0.3897 -0.3318 -0.1112 -0.3899 -0.1555 -0.1869 -0.1142
        0.5425   0.6198
19.ID#c.FL -0.8572 -0.0816   -0.3011 -0.3325 -0.2715 -0.1334 -0.2793 -0.1532 -0.1425 -0.1628 -
0.0010   -0.0169
20.ID#c.FL -0.0279 -0.9878   -0.0856 -0.0661 -0.0713 -0.0004 -0.0474 -0.0348 0.0352 -0.0736 -
0.0686   -0.0870
21.ID#c.FL -0.1012 -0.0908   -0.8215 -0.1468 -0.1430 -0.0328 -0.1230 -0.0414 -0.0046 -0.1183 -
0.0388   -0.0782
22.ID#c.FL -0.2184 -0.0852   -0.2289 -0.8248 -0.2281 -0.0682 -0.2469 -0.1068 -0.0627 -0.1315
        0.0505   0.0739
23.ID#c.FL -0.1404 -0.0813   -0.1799 -0.1914 -0.8782 -0.0395 -0.1764 -0.0649 -0.0324 -0.1189
        0.0556   0.0579
24.ID#c.FL -0.0955 -0.0073   -0.0658 -0.0752 -0.0564 -0.9862 -0.0619 -0.0234 -0.0426 -0.0184
        0.0086   -0.0121
25.ID#c.FL -0.2761 -0.0801   -0.2685 -0.3212 -0.2733 -0.0825 -0.8883 -0.1118 -0.1222 -0.1497 -
0.0234   0.1482
26.ID#c.FL -0.0738 -0.0342   -0.0502 -0.0721 -0.0515 -0.0111 -0.0465 -0.9704 0.0031 -0.0214
        0.0177   0.0125
27.ID#c.FL -0.0409 0.0452   0.0056 -0.0062 0.0017 -0.0222 -0.0267 0.0146 -0.9599 0.0185
        0.0323   0.0681
28.ID#c.FL -0.0424 -0.0708   -0.1036 -0.0791 -0.0886 0.0022 -0.0651 -0.0148 0.0114 -0.9499 -
0.0921   -0.1002
_cons -0.6180 -0.0841 -0.4671 -0.5756 -0.4633 -0.1881 -0.5354 -0.2532 -0.2991 -0.2108 0.3232
        0.3267

2015. year# e(V)	2016. year# c.FL	2017. year# c.FL	2018. year# c.FL	2.ID# c.FL	3.ID# c.FL	4.ID# c.FL	5.ID# c.FL	6.ID# c.FL	7.ID# c.FL	8.ID# c.FL	9.ID# c.FL

2015.year#
c.FL   1.0000
2016.year#
c.FL   0.8628   1.0000
2017.year#
c.FL   0.8082   0.8179   1.0000
2018.year#
c.FL   0.8268   0.8300   0.8358   1.0000
2.ID#c.FL -0.1370 -0.1210   -0.0994 -0.1175 1.0000

3.ID#c.FL -0.1399 -0.0581   -0.0590 -0.0702 0.0495 1.0000

4.ID#c.FL -0.0645 -0.0324   -0.0054 -0.0386 0.0205 0.0381 1.0000

5.ID#c.FL -0.0233 0.0064   0.0355 -0.0204 0.0077 0.0201 0.0621 1.0000

6.ID#c.FL 0.1492 0.1412   0.1226 0.1505 -0.0255 0.1052 -0.0215 -0.0286 1.0000

7.ID#c.FL -0.0633 -0.0683   -0.1643 -0.1400 0.0378 0.2535 0.0144 -0.0020 0.1049 1.0000

8.ID#c.FL -0.0406 -0.0458 -0.0859 -0.0923 0.0228 0.1824 0.0227 0.0237 0.0304 0.1645 1.0000

9.ID#c.FL -0.0381 -0.0302 -0.0437 -0.0604 0.0235 0.2530 0.0258 0.0215 0.0399 0.1384 0.1205 1.0000

10.ID#c.FL -0.0031 -0.0446 -0.0071 -0.0056 0.0448 0.3520 0.0287 0.0142 0.0961 0.2292 0.1708 0.2307

11.ID#c.FL -0.1635 -0.1585 -0.1430 -0.1502 0.0652 0.0706 0.0308 0.0029 -0.0245 0.0479 0.0293 0.0394

12.ID#c.FL -0.0355 -0.0821 -0.0347 -0.0374 0.0200 0.1688 0.0068 0.0037 0.0405 0.1289 0.1055 0.1084

13.ID#c.FL -0.0574 -0.0178 -0.0182 -0.0233 0.0519 0.4782 0.0170 0.0005 0.1322 0.2742 0.1975 0.2908

14.ID#c.FL -0.0643 -0.0488 -0.0418 -0.0584 0.0632 0.5746 0.0432 0.0219 0.1824 0.4142 0.2715 0.3258

15.ID#c.FL -0.0483 -0.0702 -0.0752 -0.0769 0.0409 0.1123 0.0173 0.0069 -0.0078 0.0566 0.0496 0.0833

16.ID#c.FL -0.1270 -0.1292 -0.3913 -0.2197 0.0563 0.4242 0.0236 -0.0077 0.1351 0.4554 0.2733 0.2553

17.ID#c.FL 0.0282 0.0341 0.0184 0.0389 0.0075 0.1148 -0.0077 -0.0190 0.0886 0.1175 0.0323 0.0452

18.ID#c.FL 0.6152 0.6264 0.5732 0.5781 -0.0216 0.3673 0.0188 0.0218 0.2295 0.2535 0.1681 0.2196

19.ID#c.FL -0.0239 -0.0189 -0.1273 -0.1184 0.0388 0.3310 0.0168 0.0029 0.1360 0.3428 0.1947 0.1847

20.ID#c.FL -0.1319 -0.1431 -0.1057 -0.1237 0.0484 0.0530 0.0502 0.0373 -0.0381 0.0158 0.0180 0.0383

21.ID#c.FL -0.0947 -0.0984 -0.1044 -0.1228 0.0556 0.1271 0.0364 0.0184 -0.0147 0.0779 0.0669 0.0914

22.ID#c.FL 0.0620 0.0763 0.0637 0.0692 0.0475 0.2390 0.0331 0.0088 0.0782 0.1574 0.1000 0.1427

23.ID#c.FL 0.0417 0.0443 0.0271 0.0280 0.0433 0.1668 0.0315 0.0152 0.0310 0.0986 0.0734 0.1130

24.ID#c.FL -0.0006 -0.0019 -0.0293 -0.0124 0.0130 0.0723 -0.0151 -0.0222 0.0384 0.0860 0.0509 0.0199

25.ID#c.FL 0.1487 0.1573 0.1514 0.1411 0.0359 0.3247 0.0137 0.0076 0.1103 0.1846 0.1395 0.2045

26.ID#c.FL -0.0233 -0.0088 0.0041 0.0173 0.0150 0.0578 0.0319 0.0161 0.0425 0.0580 0.0040 0.0153

27.ID#c.FL 0.0961 0.0886 0.0687 0.0733 -0.0361 0.0423 -0.0444 -0.0263 0.0438 0.0305 0.0262 0.0224

28.ID#c.FL -0.1300 -0.1211 -0.1504 -0.1479 0.0464 0.0708 0.0260 0.0178 -0.0415 0.0346 0.0372 0.0664

_cons 0.3223 0.3315 0.2819 0.3062 -0.0378 0.4555 0.0250 0.0209 0.2396 0.3429 0.2221 0.2598

| | 10.ID# | 11.ID# | 12.ID# | 13.ID# | 14.ID# | 15.ID# | 16.ID# | 17.ID# | 18.ID# | 19.ID# | 20.ID# | 21.ID# |
| e(V) | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL | c.FL |

10.ID#c.FL 1.0000
11.ID#c.FL 0.0596 1.0000
12.ID#c.FL 0.1864 0.0254 1.0000

```
13.ID#c.FL   0.4309   0.0624     0.1857   1.0000
14.ID#c.FL   0.5066   0.0806     0.2625   0.6289   1.0000
15.ID#c.FL   0.1076   0.0611     0.0427   0.1162   0.1367   1.0000
16.ID#c.FL   0.3790   0.0923     0.1963   0.4526   0.6450   0.1379   1.0000
17.ID#c.FL   0.1032   0.0042     0.0424   0.1383   0.1904   0.0077   0.1577   1.0000
18.ID#c.FL   0.3781  -0.0238     0.1583   0.4412   0.5788   0.0856   0.3865   0.1607   1.0000
19.ID#c.FL   0.2929   0.0480     0.1486   0.3660   0.5195   0.0774   0.5329   0.1453   0.3625   1.0000
20.ID#c.FL   0.0443   0.0639     0.0086   0.0369   0.0524   0.0607   0.0550  -0.0093  -0.0286  0.0206
             1.0000
21.ID#c.FL   0.1206   0.0822     0.0524   0.1276   0.1587   0.0894   0.1619   0.0070   0.0805  0.0962
             0.0706   1.0000
22.ID#c.FL   0.2394   0.0683     0.0936   0.2850   0.3367   0.0904   0.2648   0.0810   0.3355  0.2074
             0.0454   0.1060
23.ID#c.FL   0.1703   0.0638     0.0659   0.1885   0.2260   0.0908   0.1920   0.0382   0.2344  0.1334
             0.0540   0.1011
24.ID#c.FL   0.0460   0.0182     0.0306   0.0714   0.1130   0.0141   0.1291   0.0308   0.0838  0.0994  -
0.0066   0.0190
25.ID#c.FL   0.3382   0.0391     0.1261   0.4291   0.4492   0.1042   0.3125   0.1017   0.4680  0.2641
             0.0290   0.1073
26.ID#c.FL   0.0483   0.0183     0.0081   0.0588   0.0954   0.0043   0.0742   0.0531   0.0713  0.0702
             0.0233   0.0111
27.ID#c.FL   0.0318  -0.0493     0.0294   0.0573   0.0665  -0.0166   0.0393   0.0201   0.0894  0.0455  -
0.0515  -0.0321
28.ID#c.FL   0.0719   0.0604     0.0308   0.0673   0.0736   0.0715   0.1073  -0.0109  -0.0141  0.0412
             0.0607   0.0802
_cons        0.4178  -0.0249     0.2048   0.5180   0.6871   0.0612   0.5235   0.1845   0.7374  0.4487  -0.0311
             0.0654
```

```
              22.ID#   23.ID#  24.ID#   25.ID#   26.ID#   27.ID#   28.ID#
e(V)          c.FL     c.FL    c.FL     c.FL     c.FL     c.FL     c.FL     _cons

22.ID#c.FL    1.0000
23.ID#c.FL    0.1538   1.0000
24.ID#c.FL    0.0461   0.0239   1.0000
25.ID#c.FL    0.2604   0.1825   0.0569   1.0000
26.ID#c.FL    0.0518   0.0262   0.0041   0.0418   1.0000
27.ID#c.FL   -0.0034  -0.0141   0.0211   0.0410  -0.0224  1.0000
28.ID#c.FL    0.0530   0.0664  -0.0104   0.0489  -0.0015  -0.0312  1.0000
_cons         0.2944   0.1797   0.0985   0.4212   0.0872   0.1074  -0.0206  1.0000
```

Appendix V: Effect of Asset Tangibility And Firm Age on Roe

```
. xtreg ROE AT firm_age, fe vce(robust)

Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0016                         Obs per group: min =          7
       between = 0.0391                                        avg =        7.0
       overall = 0.0131                                        max =          7

                                                F(2,27)            =       0.09
corr(u_i, Xb)  = -0.6588                         Prob > F           =     0.9112

                                (Std. Err. adjusted for 28 clusters in ID)

                         Robust
         ROE       Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]

          AT    .0360605   .1080875     0.33   0.741    -.1857168    .2578378
    firm_age   -.0033873   .0140189    -0.24   0.811    -.0321517    .0253771
       _cons    .3900451   .8386046     0.47   0.646    -1.330629     2.11072

     sigma_u   .21063226
     sigma_e   .23323845
         rho   .44920208   (fraction of variance due to u_i)
```


```
. xtreg ROE logAT logfirm_age, fe vce(robust)

Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0098                         Obs per group: min =          7
       between = 0.0055                                        avg =        7.0
       overall = 0.0003                                        max =          7

                                                F(2,27)            =       1.52
corr(u_i, Xb)  = -0.4239                         Prob > F           =     0.2377

                                (Std. Err. adjusted for 28 clusters in ID)

                         Robust
         ROE       Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]

       logAT    .1015234   .0799095     1.27   0.215    -.0624374    .2654841
 logfirm_age   -.0569976   .0574039    -0.99   0.330    -.1747807    .0607855
       _cons    .5029562   .2211461     2.27   0.031      .049202    .9567105

     sigma_u    .1795409
     sigma_e   .23228171
         rho   .37399974   (fraction of variance due to u_i)
```

TOBINS Q

```
. xtreg Q FL, fe vce(robust)

Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0426                         Obs per group: min =          7
       between = 0.0904                                        avg =        7.0
       overall = 0.0674                                        max =          7

                                                F(1,27)            =       1.79
corr(u_i, Xb)  = 0.1451                          Prob > F           =     0.1926

                               (Std. Err. adjusted for 28 clusters in ID)
```

Q	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]
FL	.0220182	.0164766	1.34	0.193	-.011789	.0558254
_cons	.1390787	.0192499	7.22	0.000	.0995811	.1785763
sigma_u	.17859765					
sigma_e	.09270644					
rho	.78774652	(fraction of variance due to u_i)				

While controlling for age of the firm and asset tangibility

```
Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0493                         Obs per group: min =          7
       between = 0.0078                                        avg =        7.0
       overall = 0.0108                                        max =          7

                                                F(3,165)           =       2.85
corr(u_i, Xb)  = -0.2520                         Prob > F           =     0.0391
```

Q	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
FL	.021866	.0081011	2.70	0.008	.0058708	.0378611
firm_age	-.0020366	.0033265	-0.61	0.541	-.0086045	.0045314
AT	-.0352451	.0418213	-0.84	0.401	-.117819	.0473288
_cons	.2798362	.1972594	1.42	0.158	-.1096417	.6693141
sigma_u	.18951602					
sigma_e	.09294126					
rho	.80612288	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(27, 165) =    23.21            Prob > F = 0.0000
```

```
Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0073                         Obs per group: min =          7
       between = 0.0000                                        avg =        7.0
       overall = 0.0001                                        max =          7

                                                F(2,166)           =       0.61
corr(u_i, Xb)  = -0.3197                        Prob > F           =     0.5449
```

Q	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
firm_age	-.0019589	.0033887	-0.58	0.564	-.0086495	.0047317
AT	-.0383764	.0425893	-0.90	0.369	-.122463	.0457101
_cons	.3025496	.2007762	1.51	0.134	-.0938544	.6989537
sigma_u	.19388861					
sigma_e	.09468446					
rho	.80744108	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(27, 166) =    24.36              Prob > F = 0.0000
```

After log transforming the age of the firm and asset tangibility

```
Fixed-effects (within) regression              Number of obs      =        196
Group variable: ID                             Number of groups   =         28

R-sq:  within  = 0.0040                         Obs per group: min =          7
       between = 0.0014                                        avg =        7.0
       overall = 0.0008                                        max =          7

                                                F(2,166)           =       0.34
corr(u_i, Xb)  = -0.1771                        Prob > F           =     0.7151
```

Q	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logFAGE	-.028009	.0496089	-0.56	0.573	-.1259547	.0699366
logTANG	-.0180643	.0336742	-0.54	0.592	-.0845492	.0484206
_cons	.2602428	.1958946	1.33	0.186	-.1265232	.6470087
sigma_u	.18650641					
sigma_e	.09483967					
rho	.79454711	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(27, 166) =    24.11              Prob > F = 0.0000
```