MODIFIED DUPONT IDENTITY AND FINANCIAL
PERFORMANCE OF LISTED NON-FINANCIAL COMPANIES IN
KENYA

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A research project submitted to the School of Business in partial
fulfillment for the requirements of Master of Business Administration
(Finance Option) of Kenyatta University

Kenyatta University

APRIL, 2019
DECLARATION
This research project is my original work and has not been presented for award of any other academic award in any institution of learning.

Signature……………………………………Date……………………………………

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APPROVAL
This research project has been submitted with my approval as university supervisor

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DEDICATION
This research project is dedicated to my daughter, Nellygrace Mumbua and Son, Adrian
Mutua.
ACKNOWLEDGEMENT

I would like to appreciate all those who made this research project a success. First to Almighty God for gift of life and giving me courage and strength to write this Project. I am deeply indebted to my supervisor for professional guidance, cooperation, commitment and understanding throughout the period. I do also appreciate the school of business faculty members for shaping my understanding in the finance discipline.

To my dear wife for constant unlimited support throughout the period.

To my colleagues, the Master’s Degree in Business administration for their ideas, constructive criticism and contribution to this project.

May God bless you all.
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ABBREVIATIONS AND ACRONYMS

DF : Degrees of freedom

DFL : Degree of financial leverage

DOL : Degree of operating leverage

DTL : Degree of total leverage.

EAT : Earnings after tax

EBIT : Earnings before Interest and Taxes.

EBT : Earnings before tax

EPS : Earnings per share

EVA : Economic value added

GDP : Gross domestic Product

KQ : Kenya Airways Limited

MPT : Modern portfolio theory

MVA : Market value added

NSE : Nairobi securities Exchange

ROA : Return on Assets

ROE : Return on Equity
TRA86 : Tax reform act 1986

UK   : United Kingdom

USA  : United States of America
OPERATIONAL DEFINITION OF TERMS

Asset utilization: Refers to the potential of the business entity to use assets to generate income.

DuPont Identity: This is a mathematical equation that splits return on equity into Profit margin, total asset turnover and financial leverage.

Equity multiplier: is given by Total assets divided by Shareholders equity.

Financial leverage: Refers to usage of debt financing in the capital structure.

Financial Performance: Is the measurement of the results of firms policies and operations in monetary terms.

Interest burden: Refers to finance cost as a result of debt usage in financing.

Interest burden ratio: is given by pre-tax earnings divided by earnings before interests and taxes.

Interest Burden Management: Refers to planning interest payment on borrowed funds to eliminate or minimize negative financial effects on the firm.

Modified DuPont Identity: Is a decomposed Dupont identity which further splits profit margin into tax burden, interest burden and operating margin effectively making five parts including the total asset turnover and financial leverage.

Non-Financial Companies: These are firms that do not majorly deal in financial liabilities and assets but rather produce goods and services for the market.
Operating margin ratio: is given by earnings before interest and tax divided by sales

Profit margin: is the net income expressed as a percentage of sales. In the modified dupont model, it is broken into tax burden, interest burden and operating margin.

Return on equity: is the amount of net income yielded as a portion of owners equity.

Sales/operating margin: Refers to ability of the firm to manage operating costs and/or selling to maximize shareholders wealth.

Tax burden: Refers to tax incidence and deadweight costs as a result of tax

Tax burden ratio: is given by post tax earnings divided by earnings before tax.

Tax burden Management: Refers to structuring and planning financial affairs to minimize or organize tax burden effectively.

Total asset turnover ratio: is computed as Sales over total assets in the firm.

Tobin Q: Market Value of Capital Stock/Replacement Cost of Capital
ABSTRACT

Financial performance of listed non-financial companies at the Kenya’s securities market has been faced with several challenges. These challenges range from state of financial uncertainty to bankruptcy. This study investigated the effect of modified DuPont identity factors as key performance forces that explain financial performance as measured by return on equity of Non-financial firms companies in Kenya, a case of Nairobi securities exchange. Recent studies had indicated 74% of the firms in the Nairobi Securities Exchange either faced financial uncertainty or bankruptcy. The study used key modified DuPont identity factors related to firm’s performance including tax burden management, interest burden management, Operating efficiency, asset utilization efficiency and financial leverage. Investment level was used as a moderating variable in the study. A theoretical and empirical review of literature was done to establish the research gaps in the area. Shareholders, Hoffman’s tax planning, Modigliani and Miller, trade-off agency and Tobin Q theories supported the study. A causal research design was employed to conduct the research. Secondary unbalanced panel data from year 2011 through 2017 using data collection schedules was done. A census study of fourty six non-financial companies was done. The analysis of data was done using R-programme and panel regression models developed. Descriptive, inferential and relational statistics used were tested at five percent significant level. The Haussmann diagnostic test was used to determine choice of regression model. The random effect model was eventually chosen and the results indicated tax burden management, asset utilization efficiency were significant in influencing the return on equity of non-financial firms positively. Further the financial leverage and investment level as measured by Tobin q were significant in influencing the results of the firms negatively. The variable interest burden management and operating efficiency were insignificant in this study. Further researches could analyse sectoral impacts on financial performance of both nonfinancial firms and financial firms. The research has a great significance in suggesting key result drivers in corporate earning power management. Management of corporates will use the results of this study to consider and implement different and diverse corporate financial strategies to improve financial results of non-financial firms in the country and worldwide in general.
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Performance measurement describes the procedures and process of assessing the firms' actions efficiency and effectiveness (Neely, Gregory and Platts, 2016). In the corporate sector, the nature of financial performance is what the business organization is held accountable for realizing/achieving in financial terms in the period under study (Adams, 2003). A business entity's financial performance can be determined from financial statement results presented. The presented financial results from financial management reflect key performance components in line with the mission and vision of an organization. The key performance factors can bring financial success or failure of the organizations.

Kim (2016) identified the Dupont model as a valid model to use in measurement of performance. Key performance drivers of the DuPont model include the net profit margin, asset turnover, and financial leverage. Pandey (2010) observed that some financial decisions such as investments involve expenditure whose returns extend beyond a financial year. It has been noted that some companies make costly investments decisions which later lead to financial crisis or negative performances. Therefore, investment level affects the performance of entities.

1.1.1 Financial performance of listed Non-financial companies

Financial performance measures are of different nature among them, liquidity measures, activity measures, leverage and profitability measures. The DuPont identity which
combines activity, profitability and leverage measures is one of such financial performance measures. These measures are the most important in measuring long-term financial performance and of great interest to shareholders. With accelerated world corporate competition, companies are focusing their efforts on maximizing shareholder value to remain relevant and afloat. It is therefore important to measure and keep record of what value companies have made. These financial performance records help companies appraise past decisions and improve on future decisions (Moncla & Gregory, 2003).

Financial performance indicators are of different and relative importance to shareholders and stakeholders. Among the indicators are Economic value added (EVA), Market value added (MVA), return on sales, return on investments, Altmans Z-score and return on equity. Economic value added refers to the difference between post-tax operating profit and the cost of capital injected in the firm (Stewart, 2012). This is a superior method of measuring financial performance though it doesn’t indicate key performance components and their relative contribution to performance.

Market value added is the difference between the total market capitalization and total capital invested (Stewart, 2012). A high market value may an indicator of management efficiency and consequent return to shareholders. Since market capitalization is based on market figures, its fluid, virtual or lacks economic substance to majority stakeholders. This measure is highly unreliable during bullish markets when stock prices are rising.

Return on sales measures the net income per shilling of sales. It is the business entity’s potential to generate profit from sales (Stewart, 2012). This parameter can only measure
the operating efficiency of the firm. Control of sales and operating costs are the only concern of this ratio. Hence the method ignores other performance components such as interests and taxes which are major components of corporate performance.

Return on investments is the profit before interest and taxes on capital invested or total assets (Stewart, 2012). The ratio is useful to shareholders in evaluating their capital growth. The method is commonly used for short-term investments. The method similarly suffers from ignoring time factor in investment returns and cannot split the returns into specific components.

The Altman Z-score is a linear financial model used to predict likelihood of corporate bankruptcy. Its accuracy has been projected at a high rate of over 70 percentage (Diakomihalis, 2012). This method of corporate performance measurement suffers from fixed weights assigned to balance sheet components. Further, those weights have been varied thereafter by different analysts.

Return on equity is equivalent to the net income realized expressed as a ratio of Average shareholders’ equity (Isberg, 2000). This ratio is of particular interest to investors for they are able to establish the firm’s ability to provide return to their defined shareholders. The figures involved in the calculation on return on equity are after key performance indicators such as interests and taxes have been factored.

Financial performance of listed non-financial companies at the Nairobi securities exchange has been faced with several challenges. Four of the listed companies did not trade in the years 2011 through 2017 with three of the non-trading companies being non-
financial firms. The reasons cited were delisting or suspensions due to poor financial performance (NSE, 2016).

The efficient performance of companies can also be reflected by its continued earnings results in better valuation of market capitalization (Shrimal, 2014). The market capitalization ratio has been on a downward trend since 2013 (NSE reports, 2016). The rate reached forty three percent in 1994 and fifty percent in 2006 compared to high income countries that record one hundred fifty five percent (World bank, 2013). The capitalization rate has not been able to match the GDP growth rate in Kenya over time. The rates have been fifty five point eight percent, forty two percent and thirty five point five percent for the years 2013, 2014 and 2015 respectively.

Several companies issued profit warnings in the year 2015. Out of these, 12 were non-financial firms. In addition many non-financial companies have reported heavy losses in the period under study including Kenya airways and Uchumi supermarkets (NSE, 2016).

A study of non-financial firms shows that financial distress are characterized by high interest rate regimes which further strains them (Magara, 2012). Samira (2013) put seventy four percent of the listed companies as either facing uncertainty or distress levels. He specifically puts failed or financially distressed companies at twenty eight point six percent; those on grey zone (uncertainty) at forty five point seven percent and twenty five point seven percent are in safe zone. Samira examined the traditional Z-Score variables using Altman model which predicts the bankruptcy of companies at over 70 percent accuracy (Diakomihalis, 2012).
In the year 2015 the NSE returns fell by twenty point ninety seven percent as measured by NSE 20-Share index that closed at 4040.75 points from 5112.65 in 2014. This effectively reduced paper wealth of investors by Kshs.250 billion (NSE reports, 2016).

1.1.2 The Modified DuPont Identity

The DuPont model was developed by an engineer assigned to understand the finances of DuPont Corporation in 1918. He realized that by multiplying two ratios; the profit margin (Net profit/sales) and total asset turnover (Sales/Total assets); it yielded return on assets. In 1970’s financial performance started shifting to ROE and an additional ratio called equity multiplier (Total assets/Equity) was multiplied to the existing DuPont identity and the analysis changed to return on equity. Nanavati (2013) asserts that the limitation of not being able to determine the optimal debt level in the three step model triggered development of the modified five step model, which breaks net profit margin further to measure the effect of tax efficiency, borrowing charges and operating efficiency. The modified DuPont analysis evaluates a company’s potential to increase its return on equity. Isberg (2000) asserts that the Modified DuPont model/analysis is a compass that directs the analyst towards potent and crucial areas of strength and weaknesses in the financial reports.

Tax efficiency refers to arranging ones financial affairs so that they achieve least possible tax liability. This involves good expense management, claiming all capital allowances and engaging in further tax minimizing activities. The tax burden management of a firm was measured by earnings after tax divided by earnings before tax. Hoffman (1969) opined that these tax savings from prudent tax management is redirected to the corporate for further reinvestment hence much better financial performance.
The interest burden in any firm is as a result of using debt in its capital structure. Use of debt in disproportionate levels usually occasions financial distress and in worse case scenarios bankruptcy. The firm’s ability to limit the borrowing charges to bearable levels improved its financial performance. However, Modigliani and Miller (1963) concluded that debt brings about tax shield since interest charge is tax deductible. The interest burden management was measured by earnings before taxes divided by earnings before interest and taxes. Based on the two schools of thought, management of borrowing charges was undisputedly a key factor in financial performance.

Operating efficiency is a measure of management ability to generate sales and control costs. Namazi (2013) observed that control was important and that performance measures needed to be embedded in the controls to ensure the firm achieves suitable financial performance. These controls were basically on firm’s costs and sales targets. Operating efficiency was measured by earnings before interest and taxes divided by sales. Operating efficiency variable therefore is a key influence in financial performance.

Asset use efficiency refers to the ability of the firm to use assets to generate income. Xu (2011) studied factors influencing financial performance and concluded total assets turnover had significant beneficial effect on their return on equity. Asset utilization efficiency was measured using total asset turnover ratio which divides sales by total assets. This further confirms that asset base of a firm affects its performance.

Financial leverage measures the usage of debt in financing business operations and assets. This variable was measured by total assets divided by equity. A higher equity multiplier would indicate the firm is using debt in financing assets. Tauseef, Lohano and
Khan (2015) showed that a debt is useful up to a certain extend. Beyond a certain level, the returns of the firm start declining as a result of the debt. This proved that financial leverage can be a major force in determining financial performance.

Manjunatha and Gujjar (2017) did a study of dupont model for software companies in India and found out that the results of three-step model and five-step model yielded same results. They further asserted the dupont model/decomposed ROE is the most comprehensive measure for evaluating firm performance and recommending action points for improvement.

Nanavati(2013) used the modified dupont identities to evaluate return on equity of satyam computer services limited compared to its peers and concluded that splitting down the ROE into its components gives clear links into the drivers of performance. It is only then analysts can prospect a strong or weaker performance future. He found that the three step dupont identity was not sufficient to explain interest burden and tax efficiency. It was found that the company was running on lower financial leverage hence the superior performance compared to peers.

Belascu, Ogrean and Herciu (2010) used a modified dupont analysis of the top twenty profitable companies globally and emphasized that absolute accounting figures are not relevant always and a common measurement of comparison to compose and rank the relative efficiencies of companies and eventually connect the relationship between effect and effort expended was necessary. They used the ROA,ROS and ROE and concluded that by decomposing ROE into dupont identities ranks are not preserved but dynamism is demonstrated.
Kim (2016) used the dupont analysis to study and determine the financial performance of food distribution market, Korea and concluded that the dupont identity is a sufficient measure of a firm’s profitability. In his conclusions he found out that financial leverage negatively and to a great extend affects firm’s financial performance. This was consistent to many earlier studies which found that a growth in leverage adversely affected the financial performance.

Sheela and Karthikeyan (2012) in their study of financial performance of pharmaceutical industry in India using Dupont analysis says that the absolute profit amount provides an overview without giving details about the extent to which a company manages debts, dividend or other indicators. The Dupont model provides a basis for detailed analysis and comparison and ranking of various efficiencies within a company. They further found out that operating efficiency (Sales margin) was the most key strategy used by the top ranking pharmaceutical companies in India.

1.1.3 Non financial firms listed at the Nairobi securities exchange
The Nairobi securities exchange had seventy two listed companies in 1970’s as opposed to current sixty five listed companies by end of the year 2017. The recorded decline in listed/trading companies has been occasioned by delisting and suspensions. Further, it is observable the number of listed companies is never equivalent to the number that trades since year 2011. The reasons for the delisting/suspensions, unmatching listed and trading companies include but not limited to financial performance (NSE report, 2016).

The current listed sixty five are both from financial sector and Non-financial sector. The financial sector is closely regulated by central bank and insurance regulatory authority
and for that reason is excluded from this research. There are forty six non-financial firms listed under the following sectors: Investments, Manufacturing & allied, Agriculture, commercial & services, telecommunication & technology, automobiles & accessories, Construction & Allied and Energy & Petroleum. It was of great importance to understand the significance of study variables that drive financial performance of non-financial firms at the securities market.

Samira(2013) asserts that out of the firms sampled two were in distress zone while sixteen were in gray zone(uncertainty). It is further curious to the researcher all these firms not in safe zone were non-financial firms. Some of the non-financial firms identified included Total Kenya, Kenya airways, Athi River Mining, East Africa Portland Cement Corporation and Kenol-Kobil spanning for several years.

In the year 2015, sixteen non-financial firms issued profit warning while in 2016 eleven issued. The recent year 2017, twelve firms issued profit warnings. A significant number of eight related to nonfinancial sector in both 2016 and 2017. Among these firms included the Standard group, Bamburi, Flame tree, BOC Kenya, Deacon East Africa, Mumias Sugar, Nairobi ventures and Unga group. It was worth noting this constitutes a significant 19 percent of the non-financial firms listed in the Securities market.

Evidently there existed financial performance problem in the non-financial firms which has not been addressed sufficiently by previous studies. The evidence was backed by profit warnings, heavy losses, low market capitalization and signaling Z-score results. The previous studies majored on the Altman Z-score which has fixed weights on ratios, have been varied by subsequent researchers and never considered the investment level as
a moderating factor. The researcher sought to determine the impact of modified DuPont identity on financial performance of Non-financial companies in the Nairobi’s security market.

1.2 Statement of the Problem

The financial performance of majority nonfinancial companies has witnessed cyclical performances in the past few years. A bankruptcy prediction model by Samira (2013) using the Z-score on listed companies at Nairobi securities exchange puts companies facing uncertainty and financial distress at seventy four percent. Evidently, the firms that faced the bankruptcy risks were non-financial. During the period under study Non-financial companies continued issuing profit warnings, being an indicator of likely declining performance. In year 2015, twelve non-financial firms issued the warning to company stakeholders while in 2016 seven issued. In 2017, nine firms issued profit warnings. Among these firms included the Standard group, Bamburi, Flame tree, BOC Kenya, Deacon East Africa, Mumias Sugar, Nairobi ventures and Unga group. It is worth noting this constitutes a significant 19 percent of the non-financial firms listed in the Securities market. (NSE, 2016). Kenya senate reports (2015) by public accounts committee, on Kenya airways, the 10 year project Mawingu imprudent asset utilization and operational inefficiencies in Kenya Airways Ltd. contributed significantly to the Kshs 26 billion losses. The spectacular case of Uchumi supermarkets facing financial distress is a case in point.

Nyamboga, Omwario, Muriuki and Gongera(2014) studied determinants of financial distress in Non-financial firms listed at Nairobi securities exchange and found out that
liquidity and leverage had no major influence on performance while profitability and growth were of significant contribution to financial distress.

Elsewhere Almazari (2012) studied declining performance of one of the largest banks in Middle East, Jordanian Arab bank using DuPont analysis and concluded insufficient debt usage (equity multiplier) was responsible for declining performance. Raza, Jawaid and Adnan (2013) studied the insurance sector in south Asian region using dupont and concluded that employment of debt (equity multiplier) and assets (asset turnover) was responsible for greater financial performance. Sheela and Karthikeyan (2012) study on pharmaceutical industry in India concluded that operating efficiency (Sales margin) was the most key strategy used by the top ranking pharmaceutical companies in India. Maria and Teodor(2014) conducted a DuPont analysis of companies listed in Bucharest stock exchange, Romania and concluded that leverage and profit margin was responsible for good financial performance than asset turnover.

A research gap exists on effect of modified DuPont identity on financial performance of listed non-financial firms in the NSE. This was evidenced by limited number of local studies, the exposed financial difficulties faced by significant non-financial firms, studies that never incorporated investment level as moderating variable and conflicting results from other jurisdiction studies on DuPont analysis.

1.3 Objectives of the study

This section discusses the general and specific objectives of the study
1.3.1 General Objectives
The main objective was to study effect of modified DuPont identity on financial performance of listed Non-financial companies at the Nairobi securities exchange.

1.3.2 Specific Objectives
I. To assess effect of Tax burden management on financial performance of listed Non-financial companies.

II. To analyse effect of Interest burden Management on financial performance of listed Non-financial companies.

III. To find out effect of operating efficiency on financial performance of listed Non-financial companies.

IV. To examine effect of Asset utilization efficiency on financial performance of listed Non-financial companies.

V. To determine effect of financial leverage on financial performance of listed Non-financial companies.

VI. To assess the moderating effect of investment level on financial performance of listed Non-financial companies.

1.3.3 Research Hypotheses
I. Ho$_1$: Tax burden Management has no significant effect on financial performance of listed Non-financial companies.

II. Ho$_2$: Interest Burden Management has no significant effect on financial performance of listed Non-financial companies.
III. Ho₃: Operating efficiency has no significant effect on financial performance of listed Non-financial companies.

IV. Ho₄: Asset utilization efficiency has no significant effect on financial performance of listed Non-financial companies.

V. Ho₅: Financial Leverage has no significant effect on financial performance of listed Non-financial companies.

VI. Ho₆: Investment level has no significant moderating effect on financial performance of listed Non-financial companies.

1.4 Significance of the Study

The management of listed firms will find the report useful in understanding how the variables affect their performance, benchmarking purposes and strategy formulation. Among the five variables listed in the research, their level of influence will be determined and hence the managers will be able to lay down financial strategy to improve the financial performance of the companies. Managers will also be able to compare their performance against the general indexes developed from this study.

The Investment advisors will be able to use it to determine appropriateness of certain financial decisions and development of policy frame work related to the research variables. It is anticipated advisors will be able to lead companies on financial project advisory based on the variable indexes and strength relationship derived from this study.

Investors will benefit from the research by understanding the implications of certain investment levels in their portfolio hence prudence in investment decision making.
Further, investors will be able to determine the likely returns from their investments and make decisions as to their desirability.

Academics and researchers will use the research for scholarly purposes. The contributed new knowledge in this area will help them in coming up with new research problems, critic the findings and make appropriate recommendations.

1.5 Scope of the Study
The study was confined to the 46 Non-financial companies publicly listed in the Nairobi securities Exchange market between years 2011-2017. Isberg (2000) opined that a proper ratio analysis would include at least three to five years of analysis. Data was studied for years from 2011-2017. During this period, non-financial firms experienced high numbers in financial uncertainty and distress as proved by Z-scores of listed companies, significant number were delisted or suspended and a significant percentage issued profit warnings.

The study majored on the modified DuPont identity factors that drove financial performance which included tax burden management, interest burden management, Operational efficiency, Asset utilization efficiency and financial leverage and their effect on financial performance. The investment level was included as a moderating variable.

1.6 Limitations and Delimitations of Study
The study was underpinned on the assumption that there was even performance throughout the financial year which may lead to erroneous conclusions. The researcher
averaged a long period of time to eliminate significant cyclical variations and extraordinary effects in the results.

There was limited empirical studies in Kenya on DuPont identity. The researches in Kenya jurisdiction majored only on one or few factors in the DuPont identity. The researcher relied on other jurisdiction studies, related and unpublished studies.

The effect of intangible assets may not have been sufficiently captured by the studies. Many firms exclude intangibles in their reporting. Since the research is over long period, the researcher used asset bases as provided by the audited financial statements. Again to minimize the effects of unreported intangibles, Tobin Q was used as a moderating variable.

1.7 Organization of the Study

The study is be composed of five chapters. Chapter one with a background study and problem statement that triggers the research, research objectives, hypotheses as well as significance of the study. Chapter two presents a reviewed literature which included theoretical and conceptual framework supporting the study. It further exposed the research gap. Chapter three presents methodology of study and procedures used for data collection and analysis. Chapter four shows the results of the study in line with the objectives. Finally, Chapter five provides the researcher’s summary of findings, conclusions and recommendations.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction
The Literature review includes the theoretical framework, empirical studies, critical review, research gap and conceptual framework necessary for the study.

2.2 Theoretical framework
Financial performance springs from the competing interests of stakeholders. Key among the stakeholders are the shareholders whose interest is paramount because they determine the investment level and desired returns. Management goal on the other hand is to manipulate the modified Dupont variables to achieve financial results which maximize shareholders wealth. Different theories support this positions.

2.2.1 Shareholders theory
According to Friedman (1970), firms that diligently seek to serve the interest of shareholders align their strategies to create more value to shareholders. The main goal of the firm is to pursue shareholders wealth and that corporate social responsibility is a secondary goal at the discretion of shareholders and not management.

Sean (2002) used the shareholders theory and concluded that interests of other persons are considered by shareholders only when they affect her interests. Indeed the conclusion was that the interest of shareholders is paramount. Friedman(1970) acknowledged that the theory as lacking minimal level of decency expected from mutual persons.
Terence (2011) asserted that the shareholders theory is in itself sound because the shareholder is sufficiently defined. The critic faced by the theory is because of disrepute brought by executives. He further asserts stakeholder theory which is preferred by other scholars is ambiguously defined which makes it difficult for the framework to become operational in practical business settings.

This theory was in support of firm’s financial performance in the study because company’s efforts are directed at rewarding the ultimate owners (shareholders). One of the measures of reward to shareholders is the Return on Equity which is the dependent variable in this study.

2.2.2 Hoffman’s Tax Planning Theory
According to Hoffman (1961), tax planning strives to re-direct cashflows, which would be paid to revenue authorities, to corporates. Tax planning activities are required and necessary when they decrease taxable income to minimum, whilst retaining or increasing accounting income. The theory is underpinned on the fact that businesses tax liability is dependent on taxable income instead of accounting income. The ultimate objective is therefore to increase business transactions that minimize taxable income but have no implications on accounting profit. The theory therefore draws a direct linkage between entity tax planning and its financial performance. Hoffman (1961) also recognized the role of tax cost in the tax planning activities. This theory thus deduces that the positive relationship between tax planning and corporate performance is premised on the assumption that benefits of tax planning exceed costs associated with tax planning.

Desai and Dharmapala (2007) made a study that incorporated tax planning, corporate governance and firm performance and concluded that tax planning savings do not have
any bearing on the business entity performance. These findings contradict Desai and Hines (2002) who concluded that increased tax planning drives improved firm performance.

This theory was in line with tax burden management which is an independent variable of this study. The effect on financial performance is proved when corporation’s tax savings increase profitability and consequently the ROE.

2.2.3 Modigliani and Miller’s Propositions on Capital Structure
Modigliani and Miller (1958) in proposition I concluded that capital structure is irrelevant in evaluating a firm’s value (Ebaid, 2009). This is regarded as ‘Proposition I’. The theorists postulated that a business organization’s value is not dependent on its ratio of debt and equity in its capital structure. The theory observed that the average cost of capital for any entity is completely delinked and unrelated to its capital structure and is equivalent to the capitalization rate of a pure equity stream of its level. Further it was averred that a firm’s value is assessed by the real assets it possesses. This assumption was premised on a perfect capital market, without bankruptcy and taxation costs, and perfect information. Modigliani and Miller (1958) originally focused on the derived benefits of debt finance through the impact of corporate tax.

Modigliani and Miller (1963) later amended their deductions about the linkage between a business organization’s value and its combination of capital structure. The theorists reached a conclusion that a tax advantage can be yielded by using debt. Incurring more debt reduces the amount of tax the business is required to pay. They asserted that the most favorable capital structure for an enterprise is one that entirely uses debt without any equity. Modigliani and Miller’s proposition II were based on the supposition of a
perfect capital market without any taxation and bankruptcy costs, and perfect information.

Alifani and Nugroho (2013) concluded that business enterprises prefer to hold up the debt in their capital structure owing to the tax shield advantage due to the payment of interest and this stimulates the entity’s market value.

The proposition I was in line with asset use efficiency which is an independent variable because it proposes real assets are the value drivers in the firm. Proposition II was in line with tax burden management, interest burden and financial leverage which are all independent variables in this study.

### 2.2.4 Trade-off Theory

Kraus and Litzenberger (1973) formulated an optimal financial leverage model and hence trade-off theory. Later Scott (1976) and Kim (1978) stated that the trade-off theory opines that the best capital structure is derived from considering the financial tax benefits that arise from debt usage, against the financial disadvantages attributable to debt which includes financial distress and agency costs. Initially the static trade-off theory of capital structure supposed that the trade-off resulting from the tax shield advantages of debt and the financial distress costs is expected to achieve the optimal quantity of debt to maximize the entity’s value (Myers 1984). In order to achieve this, a firm has to balance the tax savings that stem from debt usage and increasing agency costs, risks of bankruptcy threat and financial inadequacies (Ayen & Oruas 2008).

Lemmon and Zender (2010) however argued that the trade-off theory doesn’t inform the debt financing behavior and hence financial performance of firms compared to the
pecking order theory. These conclusions were from a wide cross section of firms over an extended time period studied in his research.

This theory informed the use of financial leverage, interest burden, and tax burden management which are independent variables in this study.

2.2.5 Agency Theory

Jensen and Meckling (1976) stated that agency is whereby a person engages another person to undertake some service or job on his/her behalf. It entails assigning some decision-making power to the person called agent. Agency theory is linked to agency challenges precipitated by control of resources between the various organization’s managers and shareholders, or perceived benefit conflicts (Ayen & Oruas 2008). An agency relationship arises when a party called principal assigns decisions making or responsibilities to the agent. The setbacks of an agency stem from conflicts between the actions and intentions of a principal and those of an agent. These dissimilarities in decisions and actions jeopardize the profitability of the firm through managers introducing more operational costs and office packages hence diminishing returns.

Gedajlovic and Shapiro (1998) examined the agency theory and concluded that the agency problem can be resolved through governance mechanisms. However the researchers concluded that it continued being important part of corporate financial restructuring.

Namazi(2013) analyzed the role of agency theory and demonstrated that the theory posited why control was important and performance measures needed to be incorporated in the control system in order to attain suitable performance.
The theory was in support of the operating efficiency variable where cost control and sales management are a major focus to ensure firm’s performance.

2.2.6 Tobin’s Q Theory of Investment

Tobin (1969) formulated this theory in which Nobel laureate economist postulated the q theory of investment which associates an enterprise’s investment choices to changes in the stock exchange market (Uwe, Deryl, Peter, 2015). Tobin concluded that when a business institution funds its investment capital by listing shares in the securities market, then the entity’s share prices was a factor of the investment choices and actions made by the entity.

A business investment choices depends on Tobin’s q ratio: where a ratio of q>1 would mean the firm is overvalued and q<1 means the firm is undervalued.

The market value of a business’ capital stock as expressed in the numerator refers to the market value of its capital as established by the securities market (Jim, 2002). The replacement cost of an enterprise’s capital as indicated in the denominator depicts the real value of existing capital stock when bought at the current price. Therefore Tobin’s q theory defines net investment by comparing the market value of an entity’s shares against the replacement cost of its actual capital. In other words the q-ratio predicts that profitable investments are the ones where its q exceeds a unit.

This theory was in support of the moderating variable; investment level deployed by the firm which was likely to change the study relationship model.
2.3 Empirical review

This Section reviewed related studies with an aim of determining coverage and arising gaps to be filled by the study.

2.3.1 Tax burden and financial performance
Constantin (2012) studied 90 companies in Romania and interpreted the correlation at ten percent significance between variables dependent, ETR(effective tax rate) and the second independent variable, ROE, they noted that this is a negative one. Other key variables in the model included sales margin, asset utilization ratio and size of the companies. Thus, the profitability of a company influences in the opposite way the effective tax rate. As a conclusion, they noted that, to an increase of one percent of the actual share of ROE, corporation tax from next year would decrease with point zero one five percent. This confirmed the assumption made that a firm would give stronger evidence of effective management of the taxes, achieving reduced effective tax rates.

Alloza(2016) on his study in USA panel data of American households headed by adults of between 25-65 years on effect of tax rates on income mobility concludes a unit percent marginal tax rate increase can reduce probability of the income mobility of an economic unit by point eight percent .The study used linear probability model to reach conclusions. Tax burden therefore impliedly was found to influence the net income negatively at 0.01 significance level.

Jennings, Weaver and Mayew (2011) examined a huge sample-with 75,000 firm-year observations-over a 30 years duration, 1976-2005. The analysis of correlation where done at five percent significant level. For other analyses they found an abrupt implicit taxes drop following 1986, pointing a structural change in the levels of implicit taxes after the
enactment of TRA86. By applying an analysis that approximates the extent of implicit taxes, they found that before TRA86 enactment, firms lose all the tax preferences benefits to implicit taxes. However, following TRA86 enactment, business entities lose less to implicit taxes. The conclusion on this study was tax burden management has little effect on financial performance because it was seen as function of law than tax planning.

Kutz, Khan and Schmidt (2013) used the DuPont framework in ordinary regression analysis to identify the drivers of future profitability for a propensity score matched-sample of 67000 firms-years with various levels of tax avoidance. The variables of profit margin, asset efficiency and leverage on effective tax, interest and sales growth were under study. They found that the relationship between present and future earnings on effective taxes is lower for tax aggressive business entities compared to entities that are not tax aggressive; Tax aggressive entities’ low future profitability mainly stems from the low operating margins and the lower margins often persist for about five years. Therefore tax burden management had no significant effect on performance at 0.1 significance level.

2.3.2 Interest burden and financial performance
Guariglia, Spaliara and Tsoukas (2012) studied how interest burden affect firm survival in the United Kingdom of over 14,000 unquoted firms using cloglog model. Their findings were drawn from an entity-level data during the 2000 -2009 period. They deduced that there is a strong association between financing charges and an entity’s survival. This association was very strong in the 2007-09 financial crises. They also differentiated firms into two categories: entities that are more likely to encounter financing challenges and those that are less likely to face financing setbacks and
challenges, and established that survival odds of recent, non-exporting entities that rely on banks are grossly affected by interest payments. Interest burden in this study was found to be negative on financial performance using F-Test of equality.

Debrun and Kinda (2013) in their paper Squeezing Feeling: The Interest Burden and Public Debt Stabilization stated that considering colossal public debts that have been inherited, countries facing increasing costs of borrowing are bound to legislate more aggressive fiscal consolidations than required by strict solvency distresses. The study was conducted in fifty six countries using a regression solvency test. Interest burden was a challenge to all advanced economies and sixty percent on the developing countries. The coefficient test of equality was used.

Nissim and Penman (2001) did an Empirical study on the impact of Interest Rates changes on Accounting Rates of Return, Equity Values and growth, and found that in the short term, both real and nominal rates are directly proportional to future profitability and growth. The study was on 50,000 firm-year observations. Hence, interest rates increments trigger higher profit margins and growth. However, the subsequent growth in earnings is usually not adequate to cover the increase in the required return that arises from the interest rate increment. Therefore overall impact on equity worth is negative, a finding that is similar to the observations deduced in the study for interest rates and stock returns. Ramudu, Parasuraman and Nusrathunnisa (2012) study on What Drives Shareholders’ Return? Evidence gathered from the Indian Steel industry after conducting a DuPont analysis of 342 companies on interest indicated that, conventionally, ROE decreases with increases in interest charges and vice-versa. Since the Sig. F exceeded 0.05 in every single year, the study concluded that entities’ ROE in Indian steel industry were not
driven by interest burden. Other variables in the study included tax burden, equity multiplier, sales margin and asset turnover and were shown to have an impact on financial performance.

2.3.3 Operational efficiency and financial performance
Mulchandani and Mulchandani (2016) studied Impact of internal factors on profitability of selected two listed gold loan companies in India for five years. There was a significant negative correlation (−0.769 at one percent level of significance) between: Operating Efficiency (OE) and ROA. If Total Expenses / Total Revenue Ratio (OE) increase means total expenses are increasing and operating efficiency of the companies decreases, which ultimately deprived the profitability measure. In conclusion operating efficiency increased with expenses hence the negative correlation. Other key variables in the study included size, asset quality, capital and management efficiency which had significant impact on profitability.

Werner and Moormann (2009) in their paper Efficiency, size, markets share and Profitability of 61 European Banks –How Important Is Operational Efficiency? The researchers concluded that technical efficiency has became a major factor for financial performance of banks both in cross-sectional and panel regressions at ninety five percent confidence level. Notably, banks run with higher technical efficiency post more profits compared to their peers. Therefore, the enquiry whether efficiency was important for success in banking was correct.

Qudah (2011) studied Operating Efficiency and Market Value of Jordanian Privatized Firms: Fixed and Random Effects Analysis through the period 1992-2005. Other variables in the study included size, liquidity, strategic partners. The variables GDP growth and
openness of economy were measured at one percent level of significance. In particular, operating efficiency was evaluated using turnover ratio (fixed assets turnover), while performance was determined by use of market value ratio (share market price to share book value). Panel data analysis was used to establish the effect of privatization on entities’ efficiency and performance. The outcome showed that privatization has a major positive impact on business operating efficiency as determined by fixed asset turnover and performance as determined by market value ratio.

Greene & Segal (2014) researched on Profitability and Efficiency in the U.S. Life Insurance Industry using stochastic frontier to estimate cost inefficiencies. They found that cost inefficiency in 136 business firms within the life insurance industry had a major impact on performance compared to earnings, and that inefficiency adversely affects profitability parameters like the return on equity. The study of cost inefficiency and organizational form was conducted at five percent significance. The cost inefficiencies were at fifty four percent.

2.3.4 Asset utilization efficiency and financial performance

Warrad and Omari (2015) analysed the effect of turnover ratios on Jordanian Services Sectors’ Performance of eight companies for 5 years and concluded there was no significant effect of total asset turnover on Jordanian services sectors’ ROE at 5 percent significance level using ANOVA. Further there was no major effect of fixed asset turnover on Jordanian services sectors’ ROE.

Xu (2011) studied Factors influencing Financial Performance of 28 firms listed at Shanghai Stock Exchange 50 (SSE 50) and concluded that total assets turnover ratio
had a significantly beneficial effect on both ROA and ROE. He used multiple regression at five percent significance besides studying effects of liquidity and leverage.

ANI (2014) studied Effects of assets structure on the financial performance: evidence from Sultanate of Oman and concluded that in light of ROE, the asset’s structure did not have a significant bearing on profitability. This implies that any alteration on the structure of assets would not occasion any ROA shifts. Further results revealed that ROE shifts are influenced by fixed assets while ROA is not. Other variables studied such as current assets had no effect on ROA and ROE at five percent significance level.

2.3.5 Financial leverage and Financial performance

Tauseef, Lohano and Khan (2015) studied the impact of debt funding on corporate financial Performance: evidence from Textile firms in Pakistan and found that as the debt-to-asset ratio grows, at start the return on equity grows until an optimal debt amount is attained, after which it begins to decline. A non-linear relationship was observed from the 95 textile companies in the study where other factors such as sales growth and entity size were studied. The significance level used was five percent on the variable analysis. The optimal debt-to-asset ratio for textile firms in Pakistan was approximated at fifty six percent. This outcome showed that the textile organizations with huge debts have to incur high interest costs, thereby leaving a small percentage of the net income for distribution to shareholders.

Khalid, Ali, Baloch & Ali (2012) Analysis of the Impact of Leverage on Various Measures of Corporate Performance of 374 non-financial companies for 10 years, using Arellano and Bond Dynamic Panel Data Estimation Technique found that whereas leverage and ROE bear an inversely proportional and significant relationship, high
leverage compels the firm managers to perform optimally owing to the large interest burden and agency fee. Other variables studied included size of the companies. These other variables were determined to have significance too.

Patel (2014) analysis on Impact of Leverage on Profitability: A Study of Sabar Dairy studies result of 29 year regression indicated that DOL, DFL and DTL coefficients have a slight positive correlation with ROCE at one percent significance level, however, the overall model bears a lot statistical significance; DOL, DFL and DTL coefficients had a slight positive correlation with ROE, however, the overall model was of high statistical significance; DOL coefficient registered a significant and positive correlation on ROA, DFL coefficient posted a negative correlation on ROA; while, DTL had a slight positive correlation with ROA. However, the overall model has statistical significance and the DOL, DFL and DTL coefficients had a slight positive correlation with EPS. Further, overall model was statistically significant. The result deduced that Sabar Dairy had used the operating, financial and total leverages effectively.

Gweyi and Karanja (2014) studied the impact of financial leverage on financial performance of 40 deposits taking savings and credit cooperative in Kenya and concluded that there is positive linkage between debt equity ratio with ROE and PAT at ninety nine percent confidence interval. A weak positive association between debt equity ratio on return on assets and income growth was arrived at.

2.3.6 Tobin Q and Financial performance
Singhal R., Liang F. and Parkash M. (2016) study on Tobin Q and company performance found that a higher q ratio in traded US firms experience superior operating performance in the long run. In the short run the effects could not be not be noticed.
In their study Ng H.C., Kuik, Z.S.H and Jiat, C.H(2009) research on Tobin Q as a market based measure of firms performance and as proxy for exposure to systematic risk of 25 firms in Singapore found that firms in industries with an average q of greater than one had a premium financial performance, positive stock price performance and valuation.

Tobin Q was used in this study as a proxy to measure the investment level of non-financial firms listed in the Nairobi securities exchange.

2.4 Critical Review and Research gap

Kutz etal (2013) concluded that effective tax planning doesn’t translate to increased ROE. This is further explained by Jennings etal (2011) who contends that prior to TRA86 all tax savings were being consumed by implied taxes. They further proved that tax law reforms were the only force that can increase ROE. These results are contradicted by Constantin (2012) and Alloza (2013) who agree with the conventional norm that effective tax burden management can affect ROE positively.

Guariglia etal (2012) and Debrun and Kinda (2013) agree that survival of bank dependent firms is low because of interest burden. It is also confirmed to be the same for countries dependent on debt. Nissim and Penman (2001) in their studies content that interest burden rate changes increases the ROE in the short run but not enough to compensate the burden on the firm profitability in the long run. These studies are contradicted by Ramudu etal (2012) who concluded that interest burden did not affect the ROE of steel companies in India.

Werner and Moormann (2009) concluded that technical operating efficiencies was required to improve ROE. Their observations are affirmed by Qudah (2011) and Greene
and Segal (2014) who agree operating efficiencies increases ROE. The contradictory study is from Mulchandani and Mulchandani (2016) who contends that operating efficiencies came with increased costs and affected ROE negatively.

Warrad and Omari (2015) and Ani (2014) studies indicate that total asset turnover has little significance on ROE but Xu (2011) concluded that Total asset turnover has a strong and significant link on financial performance.

Tauseef et al. (2015) studies shows that increase in debt increases ROE up to a certain limit of fifty six percent after which the ROE starts declining. Khalid et al. (2012) contents that interest burden makes managers perform optimally and therefore it negatives ROE. Patel (2014) contradicts the two by asserting the DFL is positive with ROE but not statistically significant. Gweyi and Karanja (2014) observe that the correlation is positive and statistically significant.

It can be clearly shown there exists conflicting positions on these modified DuPont identity factors in different jurisdictional studies and sectors. The gap is further evidenced by limited number of local studies and studies that never incorporated investment level as a moderating variable.
## 2.4.1 Literature Review Summary

### Table 2.1 Summary and Literature reviewed and Research Gaps

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Findings</th>
<th>Knowledge gap</th>
<th>Focus of Current study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constantine (2012)</td>
<td>The analysis of correlation between profit tax and corporate financial performance</td>
<td>Effective tax rate influences ROE Positively</td>
<td>Focused on effective tax rates and RoE</td>
<td>The current study is on effect of tax burden management on financial performance</td>
</tr>
<tr>
<td>Alloza (2016)</td>
<td>The Impact of Taxes on Income Mobility</td>
<td>Tax rate negatively influence on income mobility</td>
<td>Focused on effect of increased tax rate on income</td>
<td>The current study is on effect of tax burden management on financial performance</td>
</tr>
<tr>
<td>Jennings, Weaver and Mayew (2011)</td>
<td>The Extent of Implicit Taxes at the Corporate Level and the Effect of TRA86 University of TEXAS</td>
<td>Insufficient effect on financial performance</td>
<td>Focused on effect of tax law and planning on performance</td>
<td>The current study is on effect of tax burden management on financial performance</td>
</tr>
<tr>
<td>Kutz, Khan and Schmidt (2013)</td>
<td>Tax avoidance and profitability.</td>
<td>Tax planning had negative effect</td>
<td>Compared effect of tax planning aggressiveness and non-aggressiveness on performance</td>
<td>The current study is on effect of tax burden management on financial performance</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title</td>
<td>Study Focus</td>
<td>Financial Performance Focus</td>
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<tr>
<td>Guagriglia, Spaliara and Tsoukas (2012)</td>
<td>How does the interest burden affect firm survival?</td>
<td>Interest burden had negative effect on performance</td>
<td>Focused on effect of financing charges on survival of firms.</td>
<td></td>
</tr>
<tr>
<td>Ramudu, Parasuranan and Nusrathunisa (2012)</td>
<td>What Drives Shareholders’ Return? Evidence from Indian Steel Sector</td>
<td>Interest does not drive ROE</td>
<td>Effect of interest on RoE of steel companies</td>
<td></td>
</tr>
<tr>
<td>Mulchandani &amp; Mulchandani (2016)</td>
<td>Impact of internal</td>
<td>Had negative</td>
<td>Effect of interest burden management on financial performance</td>
<td></td>
</tr>
<tr>
<td>Factors on profitability of selected listed gold loan companies in India</td>
<td>Effect on performance</td>
<td>Operating efficiency on profitability</td>
<td>Study is on effect of operating efficiency on financial performance</td>
<td></td>
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<tr>
<td>Werner and Moorman (2009). Efficiency and Profitability of European Banks – How Important Is Operational Efficiency</td>
<td>High efficiency Increases profits</td>
<td>Effect of technical efficiency on performance of banks</td>
<td>The current study is on effect of operating efficiency on financial performance</td>
<td></td>
</tr>
<tr>
<td>Qudah (2011). The Operating Efficiency and Market Value of Jordanian Privatized Firms: Fixed and Random Effects Analysis</td>
<td>Efficiency Increases with Privatization</td>
<td>Focused on effect of privatization on efficiency</td>
<td>The current study is on effect of operating efficiency on financial performance</td>
<td></td>
</tr>
<tr>
<td>Greene and Segal (2014). Profitability and Efficiency in the U.S. Life Insurance Industry</td>
<td>Inefficiency affects profitability negatively</td>
<td>Focused on effect of inefficiency on profitability</td>
<td>The current study is on effect of operating efficiency on financial performance</td>
<td></td>
</tr>
<tr>
<td>Warrad and Omari (2015). The Impact of Turnover Ratios on Jordanian Services Sectors’</td>
<td>No major effect on performance</td>
<td>Focused on effect of fixed asset turnover on performance.</td>
<td>The current study is on effect of Asset utilization</td>
<td></td>
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<tr>
<td>Authors</td>
<td>Title</td>
<td>Findings</td>
<td>Study Focus</td>
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<tr>
<td>Xu (2011)</td>
<td>Factors Affecting Financial Performance of Firms Listed on Shanghai Stock Exchange</td>
<td>No significant beneficial effect on performance</td>
<td>The current study is on effect of Asset utilization efficiency on financial performance</td>
<td></td>
</tr>
<tr>
<td>Ani (2014)</td>
<td>Effects of assets structure on the financial performance: evidence from sultanate of Oman Dho Far University</td>
<td>ROE is affected positively by fixed assets but not total assets.</td>
<td>The current study is on effect of Asset utilization efficiency on financial performance</td>
<td></td>
</tr>
<tr>
<td>Tauseef, Lohano and Khan (2015)</td>
<td>The effect of debt financing on corporate financial Performance: evidence from Textile firms in Pakistan</td>
<td>Upto a certain level of debt performance level grows then declines</td>
<td>The current study is on effect of Financial Leverage on financial performance</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Impact of Financial Leverage on Profitability: Study of Sabar Dairy</td>
<td>Slight positive correlation with ROE</td>
<td>Overall model was significant</td>
<td>Focused on effect of DFL on performance.</td>
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<tr>
<td>Patel (2014)</td>
<td>Impact of Financial Leverage on Profitability: Study of Sabar Dairy</td>
<td>Slight positive correlation with ROE</td>
<td>Overall model was significant</td>
<td>Focused on effect of DFL on performance.</td>
</tr>
<tr>
<td>Gweyi and Karanja(2014)</td>
<td>Effect of Financial Leverage on Financial Performance of Deposit Taking Savings and Credit Co-operative in Kenya.</td>
<td>A weak association was observed</td>
<td>Focused on effect of leverage in deposit taking Saccos.</td>
<td>The current study is on effect of Financial Leverage on financial performance</td>
</tr>
<tr>
<td>Singhal R,Liang F and Parkash M(2016)</td>
<td>Tobin Q and Company Performance</td>
<td>High performance experienced</td>
<td>Focused on effect of Tobin Q on performance</td>
<td>The current study is on effect of investment level as moderating factor on financial performance</td>
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<tr>
<td>Performance</td>
<td>Q on performance</td>
<td>of investment level as moderating factor on financial performance</td>
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2.5 Conceptual Framework

Figure. 2.1: Conceptual framework

Independent variables

- Tax burden Management
  - Tax burden ratio

- Interest burden Management
  - Interest burden ratio

- Operating efficiency
  - Sales margin ratio

- Asset utilization efficiency
  - Asset turnover ratio

- Financial leverage
  - Equity Multiplier

Dependent variable

- Financial performance
  - Return on equity

Moderating variable

- Investment level
  - Tobin Q

Source: Author, 2017

The researcher used panel regression model to operationalize the variables. The dependent variable, financial performance shall be evaluated using the Return on equity. Return on equity is driven by tax burden management, interest burden management,
operational efficiency, asset use efficiency and financial leverage as independent variables. Investment level as measured by Tobin Q is thought to amplify the relationship model hence is used as a moderating variable.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

The methodology of the study included the research plan and design, location of the study, empirical model, the population and sample sizes, the data collection process, the instrument to be used for gathering data and data analysis.

3.2 Research design

The study employed causal research design. A causal research was done with an aim to identifying the scope and nature of cause-and-effect relationship. It evaluates the effects of particular changes on prevailing norms, various processes etc (Zikmund, 2012). The researcher studied the impact of the modified DuPont factors on general corporate financial performance at the Nairobi securities exchange.

3.3 Empirical model

Unbalanced panel data regression model was employed to describe the impact of modified DuPont identity on financial performance of non-financial entities in the stock exchange market. Unbalanced panel data regression model is appropriate for this research because it is takes into consideration time series trend of performance and firm specific characteristics. The researcher used Haussmann tests to determine whether fixed effects model or random effects model are efficient for the study. The random effects models would be chosen if the error term is not correlated to the regressors within the entity and
across entities while the fixed effects model would be chosen if the error terms are correlated to regressors within the entity.

i) Fixed effects Model

3.3.1 Fixed effects model without Moderating Variable

\[ Y_{it} = \beta_1 X_{1,it} + \beta_2 X_{2,it} + \beta_3 X_{3,it} + \beta_4 X_{4,it} + \beta_5 X_{5,it} + e_{it} \]

3.3.2 Fixed effects model with Moderating Variable

\[ Y_{it} = \beta_1 X_{1,it} + \beta_2 X_{2,it} + \beta_3 X_{3,it} + \beta_4 X_{4,it} + \beta_5 X_{5,it} + \beta_6 M_{it} + e_{it} \]

ii) Random effects Model

3.3.3 Random effects model without Moderating Variable

\[ Y_{it} = \beta_0 + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \beta_3 X_{3,it} + \beta_4 X_{4,it} + \beta_5 X_{5,it} + \mu_{it} + e_{it} \]

3.3.4 Random effects model with Moderating Variable

\[ Y_{it} = \beta_0 + \beta_1 X_{1,it} + \beta_2 X_{2,it} + \beta_3 X_{3,it} + \beta_4 X_{4,it} + \beta_5 X_{5,it} + \beta_6 M_{it} + \mu_{it} + e_{it} \]

Where:

\( Y_{it} \): Dependent variable, Return on Equity where \( i=\)entity and \( t=\)time

\( \beta_0 \): Unknown intercept of each entity

\( \beta_1 \) to \( \beta_6 \): Regression coefficient for \( i^{th} \) independent variable (i=1, 2,3,4,5)

\( X_{1,it} \): Tax burden ratio

\( X_{2,it} \): Interest burden ratio

\( X_{3,it} \): Sales Margin ratio

\( X_{4,it} \): Asset turnover ratio
X_{s, it}: Equity multiplier

M_{it}: Tobin Q

ε_{it}: Within-entity error term

μ_{it}: Between-entity error term

i: Number of firms under study

t: Time period (2011-2017)
### Table 3.1: Operationalization and Measurement of Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Operationalization</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Performance</td>
<td>Dependent Variable</td>
<td>It is the process of measuring the results of a firm's policy prudence and operations in money terms</td>
<td>EAT/Equity</td>
</tr>
<tr>
<td>Tax burden</td>
<td>Independent Variable</td>
<td>Refers to tax incidence and deadweight costs as a result of tax Refers to finance cost as a result of debt usage in financing Refers to ability of the firm to manage operating costs and/or selling to maximize shareholders wealth. Refers to the potential of the business entity to use assets to generate income.</td>
<td>EAT/EBT</td>
</tr>
<tr>
<td>Interest burden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asset utilization efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial leverage</td>
<td>Moderating Variable</td>
<td>Refers to employment of debt in the capital structure. Market Value of Capital Stock/Replacement Cost of Capital</td>
<td>Subtotal assets/Shareholders Equity</td>
</tr>
<tr>
<td>Investment level</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Author, 2017
3.4 Target Population

The population of interest in this study consisted all non-financial companies listed in Nairobi securities exchange between years 2011-2017. The study did not include business firms from the financial sector because they are highly regulated by central bank as to capital holding, cash reserves and provision of bad debts besides their cash trading asset has unique levels because is a trading asset (Mwangi, Makau & Kosimbei, 2014). The years 2011-2017 were population of interest because there were recorded drop in Z-score of listed companies, reported profit warnings, delistings and suspensions. Again, data from published accounts was available.

Table 3.2: Population of the study

<table>
<thead>
<tr>
<th>Year Item</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Listed Companies</td>
<td>58</td>
<td>60</td>
<td>61</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>No. of Financial Institutions</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>No. of Non-Financial Companies</td>
<td>41</td>
<td>42</td>
<td>42</td>
<td>46</td>
<td>46</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

Source: NSE, 2017
3.5 Sampling Design

A census study of all listed Non-financial companies data from 2011-2017 was used to study the variables. Census study was appropriate because it improves the credibility of the data collected by incorporating certain information-rich cases for study (Saunders, Lewis & Thornhill, 2009). The researcher purposely sampled non-financial firms to find out the impact of the variables on firm’s performance because of financial performance activity drop in terms of the Altman Z-score, profit warnings and numerous suspensions and/or delistings (NSE, 2016).

3.6 Data collection

The study employed secondary data relating to the 2011-2017 period on tax burden management, interest burden management, operational efficiency, asset utilization and financial leverage as calculated from the audited financial statements of the listed Non-financial companies. The audited financial statements included the income statements, statements of financial position and any explanatory notes.

3.6.1 Instruments

Checklists were designed by researcher for gathering secondary data from the audited financial statements of the corporations. The checklists were the most suited tool for obtaining secondary data because the variable components could be read from the audited financial results.
3.7 Data Collection Procedures

The designed checklist was used to collect secondary data from audited statements by the researcher. The data was collected in a period of three weeks. Before the data is collected the checklist was checked for validity and reliability.

3.7.1 Validity
Kothari (2014) describes content validity as the extent to which a tool or an instrument evaluates what it’s intended to assess/examines. The validity of the data collections checklists was examined by the researcher’s supervisor who had distinguished knowledge in the field of study.

3.7.2 Reliability
Reliability of data was assured by collecting information’s from the audited and published financial statements. The audited financial statements are certified for use by all stakeholders in businesses and information contained therein is confirmed to reflect true and fair view of the companies trading results.

3.8 Data analysis and Presentation

Inferential statistics, t-test and coefficient of correlation statistics were used in testing hypothesis at five percent level of significance. T-test examines the difference of two sample means by applying a spread/Dispersion parameter of the scores (Saunders, 2007). Unbalanced panel data models was applied to determine the direction and magnitude of the association between performance variables on the entity’s financial Performance. Further, diagnostic tests were conducted to establish the appropriateness and reliability of resulting model.
3.8.1 Diagnostic tests
In this study, statistical procedures were performed to determine whether regression assumptions and model hold. According to Williams et al. (2013) the assumptions includes normality, Stationarity, Autocolleration, Multicollinearity and the assumption that the independent variables are unrelated to the random disturbance error term.

3.8.1.1 Test for Normality
Ghasemi and Zahedias (2012) asserted that normality tests need be conducted to be able to draw accurate and reliable conclusions about reality. Test for normality of data was conducted using One-Sample Kolmogorov-Smirnov Test. Normally distributed data validate the application of regression model thus increasing the reliability of the findings. A significance level of 0.05 was used to determine normality of the data where a p-value of less than 0.05 led to rejection of Null hypothesis that the data is normally distributed. A data which is not normal would be checked with robust regression outlier.

3.8.1.2 Multicollinearity
Multicollinearity test was conducted to check whether there was any high correlation among independent variables in the regression model. High level of multicollinearity between two elements or factors is a pointer to less accurate estimates of individual regression parameters (Williams, 2015). The study employed VIF (Variance inflation factor) to test for multi-collinearity in testing the panel data. A VIF of greater than three indicated existence of high multicollinearity. A high multicollinearity would be dealt to by centering the variables or reducing the variables.
3.8.1.3 Test for Autocorrelation/Serial Correlation

Jensen, Simsek and Neville (2004) found that ignoring autocorrelation may result in unduly complex models, biased, inconsistent or inefficient estimators. The Autocorrelation arises when an error term of one period relates with error term of other successive period in time series data (correlation of values of same variables on related objects). Breusch – Godfrey test of panel data models was used to test the serial correlation of the panel data. A p-value of less than 0.05 would indicate absence of serial correlation. Existence of the auto correlation would be corrected using lags.

3.8.1.4 Test for Stationarity

A unit root test is used to establish whether a time series element is non-stationary, stationary, trend stationary or explosive Schwert (2015). Since the model has a time series element, it was necessary to do a unit root test to establish whether a shift in time causes a change in shape of distribution or unpredictable pattern. The unit root test of Dickey Fuller Test was used. A computed p-value higher than 0.05 would indicate existence of a unit root and hence non-stationarity. Creating lags would help deal with non-stationarity.

3.8.1.5 Test for Heteroscedasticity

Baltagi, (2008) assuming homoscedastic when heteroscedacity is present would result in consistent regression coefficient but inefficient. A test for variance of residuals in the model was used used. Heteroscedasticity refers to the condition where the dependent variable bears unequal degree of variability for every independent variables value Schwert (2015). It causes the standard errors of the estimators to be biased. The study employed Breusch-Pagan test to test for the existence of heteroscedasticity. A computed
p-value higher than 0.05 would indicate existence of heteroscedacity. If heteroscedacity is detected use of robust covariance matrix would be used to account for it.

3.9 Ethical considerations

The study was conducted in the best interests of the listed firms. Ethical issues would be the harm it may cause due to publication. The researcher will not publish individual firm ratios by names without their consent, instead codes will be used. The researcher obtained consent and approval from the university and National commission of science, Technology and Innovation.
CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the unbalanced panel data regression model, the diagnostic tests and a discussion of the results. The aim of the study was to find out the effect of Modified DuPont identity on the performance of non-financial companies in Kenya. The data collected from the audited financial statements of the forty six entities was analysed using the R-programme for statistical analysis. The findings are discussed according to the six variables of the study.

4.2 Descriptive statistics

The study sought to assess the effect between Return on Equity and Tax burden, Interest burden, Operating efficiency, Asset utilization efficiency and financial leverage with investment level as moderating variable. The Descriptive statistics findings are stipulated in Table 4.1
Table 4.1: Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE</td>
<td>311</td>
<td>0.0862</td>
<td>0.4944</td>
</tr>
<tr>
<td>Tax burden</td>
<td>314</td>
<td>0.6837</td>
<td>0.4777</td>
</tr>
<tr>
<td>Interest burden</td>
<td>313</td>
<td>0.7904</td>
<td>0.3271</td>
</tr>
<tr>
<td>Operating efficiency</td>
<td>314</td>
<td>0.1396</td>
<td>0.3280</td>
</tr>
<tr>
<td>Total assets turnover</td>
<td>314</td>
<td>4.196</td>
<td>1.692</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>314</td>
<td>10.56</td>
<td>4.029</td>
</tr>
<tr>
<td>Investment level</td>
<td>313</td>
<td>0.5258</td>
<td>0.2464</td>
</tr>
</tbody>
</table>

a. Predictors: Tax burden, interest burden, operating efficiency, Total asset turnover and Financial leverage.

b. Dependent Variable: Financial Performance (ROE)

c. Moderating Variable: Investment Level

**Source: Research Data, 2017**

From the above results it was found that the mean ROE of non-financial companies is 0.0862 with a standard deviation of 0.4944. The tax burden mean was found to be 0.6837 and a standard deviation of 0.4777, interest burden had a mean of 0.7904 and standard deviation of 0.3271, operating efficiency had a mean of 0.1396 and a standard deviation of 0.3280, asset utilization efficiency had a mean of 4.196 and standard deviation of 1.692, financial leverage had a mean of 10.56 and 4.029 as standard deviation, the investment level had a mean of 0.5258 and a dispersion of 0.2464. Among the five independent variables, interest burden was the most stable variable with a standard deviation of 0.3271.
4.3 Diagnostic tests

These tests are conducted for the researcher to determine suitability of the data for the model to be developed.

4.3.1 Normality

The normality of data is always assumed during regression analysis. To confirm the normality of data the researcher run a normality test using Kolmogorov-Smirnov Test whose results are as shown in table 4.2. The hypothesis were stated as follows;

\textbf{H}_0:\ Data\ distribution\ is\ normal

\textbf{H}_1:\ Data\ distribution\ is\ not\ normal
Table 4.2: One-Sample Kolmogorov-Smirnov Test

<table>
<thead>
<tr>
<th>N</th>
<th>ROE</th>
<th>Tax burden</th>
<th>Interest burden</th>
<th>Operating efficiency</th>
<th>Total assets turnover</th>
<th>Financial leverage</th>
<th>Investment level(Tobin Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>311</td>
<td>314</td>
<td>313</td>
<td>314</td>
<td>314</td>
<td>314</td>
<td>313</td>
</tr>
<tr>
<td>Normal Parameters(^{a,b}) Mean</td>
<td>0.086 (^2)</td>
<td>.6837</td>
<td>.7904</td>
<td>.1396</td>
<td>4.196</td>
<td>10.56</td>
<td>.5258</td>
</tr>
<tr>
<td>Normal Parameters(^{a,b}) Std. Deviation</td>
<td>0.494 (^4)</td>
<td>.4777</td>
<td>.3271</td>
<td>.3280</td>
<td>1.692</td>
<td>4.029467</td>
<td>0.2464</td>
</tr>
<tr>
<td>Most Extreme Differences Absolute</td>
<td>.358</td>
<td>.363</td>
<td>.270</td>
<td>.482</td>
<td>5.291</td>
<td>11.311</td>
<td>.660</td>
</tr>
<tr>
<td>Most Extreme Differences Positive</td>
<td>.358</td>
<td>.361</td>
<td>.270</td>
<td>.482</td>
<td>5.291</td>
<td>11.311</td>
<td>.660</td>
</tr>
<tr>
<td>Most Extreme Differences Negative</td>
<td>-.255</td>
<td>-.363</td>
<td>-.218</td>
<td>-.383</td>
<td>-.240</td>
<td>-.311</td>
<td>-.279</td>
</tr>
<tr>
<td>Test Statistic</td>
<td>.358</td>
<td>.363</td>
<td>.270</td>
<td>.482</td>
<td>.291</td>
<td>.311</td>
<td>.360</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.0612(^c)</td>
<td>.0802(^c)</td>
<td>.0513(^c)</td>
<td>.0628(^c)</td>
<td>.0543(^c)</td>
<td>.0745(^c)</td>
<td>.0499(^c)</td>
</tr>
</tbody>
</table>


b. Dependent Variable: Financial Performance (ROE)

c. Moderating Variable: Investment Level

Source: Research Data, 2017

The results show that all variables of the data are from a normal data (all p-values>0.05) hence the null is supported by current study.

4.3.2 Multicollinearity

To determine whether variables in the study were correlated, collinearity tests were done and results are as shown in table 4.3.
Table 4.3: Collinearity tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>Tax burden</td>
<td>.992</td>
</tr>
<tr>
<td>Interest burden</td>
<td>.833</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>.884</td>
</tr>
<tr>
<td>Operating efficiency</td>
<td>.835</td>
</tr>
<tr>
<td>Total assets turnover</td>
<td>.965</td>
</tr>
<tr>
<td>Investment Level</td>
<td>.916</td>
</tr>
</tbody>
</table>

a. Dependent Variable: ROE
   b. Dependent Variable: Financial Performance (ROE)
   c. Moderating Variable: Investment Level

Source: Research Data, 2017

From the results above, it’s evident that every variable has variance inflation factor of less than three, hence the multicollinearity level is negligible.

4.3.3 Serial correlation

To determine whether study variables were serially correlated, Breusch-Godfrey tests were done and results are as shown in Table 4.4. The hypothesis were stated as follows:

\[ H_0: \text{No serial correlation} \]

\[ H_1: \text{Presence of serial correlation} \]
Table 4.4: Serial Correlation tests

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>chi-square</td>
<td>47.629</td>
</tr>
<tr>
<td>Df</td>
<td>46</td>
</tr>
<tr>
<td>p-value</td>
<td>0.4062</td>
</tr>
</tbody>
</table>

Source: Research Data, 2017

The results show that the data had no serial correlation (p-values=0.4062>0.05) at 5% significance level hence the null was supported by current study.

4.3.4 Unit root test/Stationarity test

To determine whether had stationary trend or otherwise, Dickey-Fuller tests were done and results are as shown in Table 4.5. The hypothesis were stated as follows;

\[ H_0: \text{Series has a unit root (i.e. non-stationary).} \]

\[ H_1: \text{No unit root presents (stationary)} \]

Table 4.5: Unit root test

<table>
<thead>
<tr>
<th>Stationarity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistic</td>
<td></td>
</tr>
<tr>
<td>Dickey-Fuller</td>
<td>-10.237</td>
</tr>
<tr>
<td>Lag order</td>
<td>2</td>
</tr>
<tr>
<td>p-value</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: Research Data, 2017

The results show that the data trend is stationary as indicated from Dickey-fuller test (p-values=0.01<0.05) at 5% significance level hence the null was not supported in the current study.
4.3.5 Heteroscendacity
To determine existence of heteroscendacity or Homoscendacity, Breusch-Pagan tests were done and results are as shown in Table 4.6. The hypothesis were stated as follows;

\[ H_0: \text{Breusch-Pagan test is homoskedasticity} \]
\[ H_1: \text{Breusch-Pagan test is heteroscedasticity} \]

Table 4.6: Heteroscendacity Test

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>68.684</td>
</tr>
<tr>
<td>df</td>
<td>46</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000000006</td>
</tr>
</tbody>
</table>

Source: Research Data, 2017
The results show that the data is homoscedastic as indicated from Breusch-pagan (68.684) test (p-values=0.0000000006<0.05) at 5% significance level hence the null is supported by current study.

4.4 Fixed Effects Model
This model would be appropriate when correlation error term are related to regressors within the entity.
4.4.1 Fixed Effects Model without Moderating Variable

The study sought to establish the effect of Tax burden, Interest burden, Operating efficiency, Asset utilization efficiency and financial leverage on Return on equity. The findings are stipulated in Table 4.7.

Table 4.7: Fixed Effect without Moderating Variable

| Variable                      | Estimate | Std.Error | t-value | Pr(>|t|) |
|-------------------------------|----------|-----------|---------|----------|
| Tax burden                    | 0.128    | 0.074     | 3.739   | 0.043    |
| Interest burden               | -0.124   | 0.143     | -0.869  | 0.386    |
| Operating efficiency          | -0.007   | 0.019     | -0.391  | 0.696    |
| Asset utilization efficiency  | 0.094    | 0.092     | 3.015   | 0.031    |
| Financial leverage            | -0.145   | -3.855    | -3.855  | 0.000    |

Total Sum of Squares: 1771.1, Residual Sum of Squares: 1666.7

R-Squared: 0.68928; Adj. R-Squared: 0.6381

F-statistic: 3.86978 on 5 and 309 DF, p-value: 0.002043


b. Dependent Variable: Financial Performance (ROE)

Source: Research Data, 2017

Table 4.7 shows the parameter estimates of fixed effects model without moderating variable and indicates that the adjusted $R^2$ is 0.6381. This implies that 63.81% of variation in Return on equity is explained by tax burden, Asset utilization efficiency and Financial leverage in the model. This suggests that the model is suitable for prediction purpose. The results show that the overall model is statistically significant at 5% significance level.
\( F(5,309)=3.86978 \) and p-value=0.002043<5%. The predictive model is stated as shown below;

\[ Y = 0.128X_1 + 0.094X_4 - 0.145X_5 \]

Where \( Y \) represented return on equity

\( X_1 \), represented Tax burden

\( X_4 \), represented Asset utilization efficiency

\( X_5 \), represented financial leverage

In addition, the study found that Tax burden was statistically significant in the model with a p-value of 0.043<5% significance level. This implied that for one unit change in Tax burden holding other variables constant, return on equity changes with a factor of 0.128 in the model. The hypothesis that tax burden has no effect on return on equity was not supported by this study.

Similarly Asset utilization efficiency was found to be statistically significant in the model at 5% significance level (t-value=3.015 and p-value=0.031<5%). This inferred that for one unit change in asset utilization efficiency holding other variables constant, return on equity changes by a factor 0.094 in the model. The hypothesis that asset utilization efficiency has no effect on return on equity was similarly not supported by the study.

Financial leverage was also found to be statistically significant in the model at 5% significance level (t-value=-3.855 and p-value=0.000<5%). This implies that for one unit change in financial leverage, holding other variables constant, return on equity changes
by a factor -0.145 in the model. The hypothesis that financial leverage has no effect on return on equity was also not supported by the study.

The study sought to find out the effect of interest burden on return on equity. It was found out that the effect of interest burden on return on equity was insignificant at 5% significance level (t=-0.869 and p-value=0.386). The hypothesis that interest burden has no effect on return on equity was supported in the current study. This findings are in tandem with a study by Ramudu, Parasuraman and Nusrathunnisa (2012) which argued that interest burden doesn’t drive Return on equity of steel companies in India.

Further the study sought to evaluate the effect of operating efficiency on return on equity. It was found out that the relationship between operating efficiency and return on equity was insignificant at 5% significance level (t=-0.391 and p-value=0.696). The hypothesis that operating efficiency has no effect on return on equity was supported in the current study. The findings agreed with a study by Mulchandani and Mulchandani (2016) who asserted that operating efficiency comes with extra expenses hence of no effect to return on equity.

4.4.2 Fixed Effect Model with Moderating Variable
The study set to examine the effect Tax burden, Interest burden, Operating efficiency, Asset utilization efficiency and financial leverage on return on equity. The findings are stipulated in Table 4.8.
Table 4.8: Fixed Effect with Moderating Effect

| Variable                        | Estimate | Std.Error | t-value | Pr(>|t|) |
|---------------------------------|----------|-----------|---------|----------|
| Tax burden                      | 0.126    | 0.074     | 1.710   | 0.088    |
| Interest burden                 | -0.124   | -0.869    | -0.869  | 0.385    |
| Operating efficiency            | -0.007   | 0.019     | -0.386  | 0.700    |
| Asset utilization efficiency    | 0.099    | 0.093     | 1.066   | 0.287    |
| Financial leverage              | -0.135   | 0.040     | -3.356  | 0.001    |
| Investment level                | -0.094   | 0.135     | -0.697  | 0.486    |

Total Sum of Squares: 1771.1, Residual Sum of Squares: 1664.1

R-Squared: 0.060409; Adj. R-Squared: 0.020751

F-statistic: 3.30038 on 6 and 308 DF p-value: 0.0036628


b. Dependent Variable: Financial Performance (ROE)

c. Moderating Variable: Investment Level

Source: Research Data, 2017

Table 4.8 shows the parameter estimates of fixed effects model with moderating variable and indicates that the adjusted R² is 0.020751. This implies that 2.0751% of variation in Return on equity is explained by Financial leverage in the model. This suggests that the model is unsuitable for prediction purpose. The results show that the overall model is statistically significant at 5% significance level (F(6,308) = 3.30038 and p-value=0.0036628<5%). The model developed became:

\[ Y = -0.135X_5 \]
Where $Y$ represented return on equity

$X_5$, represented financial leverage

In addition, financial leverage was found to be statistically significant in the model at 5% significance level ($t$-value=$-3.356$ and $p$-value=$0.001<5\%)$. This meant that for one unit change in financial leverage, holding other variables constant, return on equity changes by a factor $-0.135$ in the model. The hypothesis that financial leverage has no effect on return on equity was not supported by the study.

The study aimed at finding out the effect of tax burden on return on equity. It was found out that the effect of tax burden on return on equity was insignificant at 5% significance level ($t$=$1.710$ and $p$-value=$0.088$). The hypothesis that tax burden has no effect on return on equity was supported in this model of study. The findings agreed with a study by Jennings, Weaver and Mayew (2011) and Kutz, Khan & Schimidt who concluded ROE is affected by other factors other than tax burden aggressiveness.

The study also sought to establish the effect of interest burden on return on equity. It was found out that the effect of interest burden on return on equity was insignificant at 5% significance level ($t$=$-0.869$ and $p$-value=$0.385$). The hypothesis that interest burden has no effect on return on equity was supported in the current study. This findings are in line with a study by Ramudu, Parasarman and Nusrathunnisa (2012) which argued that interest burden doesn’t drive Return on equity of steel companies in India.

Further, the study sought to examine the effect of operating efficiency on return on equity. It was found out that the effect of operating efficiency on return on equity was
insignificant at 5% significance level (t=-0.386 and p-value=0.700). The hypothesis that operating efficiency has no effect on return on equity was supported in the current study. The findings are in line with a study by Mulchandani and Mulchandani (2016) who asserted that operating efficiency comes with extra costs hence of no significant effect to return on equity.

Further the study sought to evaluate the effect of asset utilization efficiency on return on equity. It was found out that the effect of operating efficiency on return on equity was insignificant at 5% significance level (t=1.066 and p-value=0.287). The hypothesis that asset utilization efficiency has no effect on return on equity was supported in the current study. The findings are in agreement with a study by Warrad and Omari (2015) and Ani (2014) who asserted that asset utilization efficiency has no significant effect to return on equity.

The study incorporated a moderating variable, investment level to determine its effect on return on equity. It was found out that the effect of investment level on ROE was insignificant at 5% significance level (t=-0.697 and p-value=0.486). The hypothesis that Investment level as measured by Tobin Q has no effect on return on equity was therefore supported by the results of this model.

4.5 Random Effects Model

This model is appropriate when correlation error term are not related to the regressors within and across the entities.
5.1 Random Effects Model without Moderating Variable

The study sought to understand the effect of Tax burden, Interest burden, Operating efficiency, Asset utilization efficiency and financial leverage on return on equity. The findings are stipulated in Table 4.9.

**Table 4.9: Random Effects without Moderating Variable**

| Variable                        | Estimate | Std.Error | t-value | Pr(>|t|) |
|---------------------------------|----------|-----------|---------|----------|
| Intercept                       | 1.087    | 0.223     | 4.863   | 0.000    |
| Tax burden                      | 0.119    | 0.074     | 3.626   | 0.011    |
| Interest burden                 | -0.153   | 0.143     | -1.069  | 0.286    |
| Operating efficiency            | -0.002   | 0.018     | -0.094  | 0.925    |
| Asset utilization efficiency    | 0.176    | 0.079     | 2.218   | 0.027    |
| Financial leverage              | -0.148   | 0.037     | -3.962  | 0.000    |

Total Sum of Squares: 1847.7, Residual Sum of Squares: 1727.3

R-Squared: 0.65163; Adj. R-Squared: 0.50372

F-statistic: 4.40539 on 5 and 316 DF, p-value: 0.00068248


b. Dependent Variable: Financial Performance (ROE)

**Source: Research Data, 2017**

Table 4.9 on parameter estimates of Random effect without Moderating variable results shows that the adjusted $R^2$ is 0.5037. This implies that 50.37% of variation in Return on equity is explained by tax burden, Asset utilization efficiency and Financial leverage in the model. This suggests that the model is suitable for prediction purpose. The results
indicated that the overall model is statistically significant at 5% significance level (F(5,316) = 4.405 and p-value=0.0006825<5%). The developed model became:

\[ Y = 1.087 + 0.119X_1 + 0.176X_4 - 0.148X_5 \]

Where \( Y \) represented return on equity

\( X_1 \), represented Tax burden

\( X_4 \), represented Asset utilization efficiency

\( X_5 \), represented Financial leverage.

In addition, the study found that Tax burden was statistically significant in the model with a p-value of 0.011<5% significance level. This implied for one unit change in Tax burden holding other variables constant, return on equity changes with a factor of 0.119 in the model. The hypothesis that tax burden has no significant effect on return on equity was not supported by this study.

Similarly, Asset utilization efficiency was found to be statistically significant in the model at 5% significance level (t-value=2.217 and p-value=0.027<5%). This implies that for one unit change in asset utilization efficiency holding other variables constant, return on equity changes by a factor 0.176 in the model. The hypothesis that asset utilization efficiency has no significant effect on return on equity was similarly not supported by the study.

Financial leverage was also found to be statistically significant in the model at 5% significance level (t-value=3.962 and p-value=0.000<5%). This implies that for one unit
change in financial leverage, holding other variables constant, return on equity changes by a factor -0.418 in the model. The hypothesis that financial leverage has no significant effect on return on equity was also not supported by the study.

The study sought to assess the effect of interest burden on return on equity. It was found out that the effect of interest burden on return on equity was insignificant at 5% significance level (t=-1.069 and p-value=0.286). The hypothesis that interest burden has no effect on return on equity was supported in the current study. This findings are in line with a study by Ramudu, Parasuraman and Nusrathunnisa (2012) which argued that interest burden doesn’t drive Return on equity of steel companies in India.

Further, the study sought to evaluate the effect of operating efficiency on return on equity. It was found out that the effect of operating efficiency and return on equity was insignificant at 5% significance level (t=-0.094 and p-value=0.925). The hypothesis that operating efficiency has no effect on return on equity was supported in the current study. The findings are in line with a study by Mulchandani and Mulchandani (2016) who asserted that operating efficiency comes with extra expenses hence of no effect to return on equity.

### 4.5.2 Random Effects Model with Moderating Variable

The study sought to establish the effect of Tax burden, Interest burden, Operating efficiency, Asset utilization efficiency and financial leverage on return on equity. The findings are stipulated in Table 4.10.
Table 4.10: Random Effects with Moderating Variable

| Variable                  | Estimate | Std.Error | t-value | Pr(|t|) |
|---------------------------|----------|-----------|---------|--------|
| Intercept                 | 1.0897   | 0.2942    | 3.7037  | 0.0003 |
| Tax burden                | 0.1244   | 0.0734    | 2.6947  | 0.0091 |
| Interest burden           | -0.1381  | 0.1423    | -0.9703 | 0.3326 |
| Operating efficiency      | -0.0056  | 0.0184    | -0.3014 | 0.7633 |
| Asset utilization efficiency | 0.1368 | 0.0860    | 2.5906  | 0.0112 |
| Financial leverage        | -0.1347  | 0.0398    | -3.3853 | 0.0008 |
| Investment level          | -0.1106  | 0.1322    | -2.8368 | 0.0403 |

Total Sum of Squares: 1800.1, Residual Sum of Squares: 1689.1

R-Squared: 0.6175; Adj. R-Squared: 0.53878

F-statistic: 3.44906 on 6 and 315 DF p-value: 0.0025837


b. Dependent Variable: Financial Performance (ROE)

c. Moderating Variable: Investment Level

Source: Research Data, 2017

Table 4.10 shows parameter estimates of Random effect with Moderating variable results and that the adjusted $R^2$ is 0.5389. This implies that 53.89% of variation in Return on equity is explained by tax burden, Asset utilization efficiency, Financial leverage and investment level (Tobin Q) in the model. This suggests that the model is suitable for prediction purpose. The results show that the overall model is statistically significant at 5% significance level ($F_{(6,315)}=3.449$ and p-value=0.0025837<5%). The developed model was:
\[ Y = 1.0897 + 0.1244X_1 + 0.1368X_4 - 0.1347X_5 - 0.1106M \]

Where \( Y \) represented return on equity

\( X_1 \), represented Tax burden

\( X_4 \), represented Asset utilization efficiency

\( X_5 \), represented Financial leverage

\( M \), represented investment level.

In addition, the study found that Tax burden was statistically significant in the model with a \( p \)-value of 0.0091<5% significance level. This implies for one unit change in Tax burden holding other variables constant, Return on equity changes with a factor of 0.1244 in the model. The hypothesis that tax burden has no effect on return on equity was not supported by this study.

Similarly, Asset utilization efficiency was found to be statistically significant in the model at 5% significance level (\( t \)-value=2.591 and \( p \)-value=0.01127<5%). This implies that for one unit change in asset utilization efficiency holding other variables constant, return on equity changes by a factor 0.1368 in the model. The hypothesis that asset utilization efficiency has no effect on return on equity was similarly not supported by the study.

Financial leverage was also found to be statistically significant in the model at 5% significance level(\( t \)-value=-3.3853 and \( p \)-value=0.0008<5%). This implies that for one unit change in financial leverage, holding other variables constant, return on equity
changes by a factor \(-0.1347\) in the model. The hypothesis that financial leverage has no effect on return on equity was also not supported by the study.

The study incorporated a moderating variable, Investment level as measured by Tobin Q to determine its effect on return on equity. It was found out that the effect of investment level on ROE was significant at 5% significance level\((t=-2.8368 \text{ and } p\text{-value}=0.0403)\). The hypothesis that Investment level as measured by Tobin Q has no effect on return on equity was therefore not supported by the results.

The study sought to establish the effect of interest burden on return on equity. It was found out that the effect of interest burden on return on equity was insignificant at 5% significance level \((t=-0.9703 \text{ and } p\text{-value}=0.3326)\). The hypothesis that interest burden has no effect on return on equity was supported in the current study. This findings are in line with a study by Ramudu, Parasaruman and Nusrathunnisa (2012) which argued that interest burden doesn’t drive Return on equity of steel companies in India.

Further, the study sought to evaluate the effect of operating efficiency on return on equity. It was found out that the effect of operating efficiency on return on equity was insignificant at 5% significance level \((t=-0.3014 \text{ and } p\text{-value}=0.7633)\). The hypothesis that operating efficiency has no effect on return on equity was supported in the current study. The findings are in agreement with a study by Mulchandani and Mulchandani (2016) who asserted that operating efficiency comes with extra expenses hence of no effect to return on equity.
4.6 Haussmann Test

The study sought to determine which of the two models between fixed effect and random effect is appropriate using Haussmann tests. The hypothesis were formulated as stated below;

\[ H_0: \text{Preferred model is random effect} \]
\[ H_1: \text{preferred model is fixed effect model} \]

The findings are stipulated in Table 4.11

<table>
<thead>
<tr>
<th>Table 4.11: Haussmann test; Fixed or Random</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haussmann Test</td>
</tr>
<tr>
<td>Statistic</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td>chi-square</td>
</tr>
<tr>
<td>Df</td>
</tr>
<tr>
<td>p-value</td>
</tr>
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</table>

Source: Research Data, 2017

Table 4.11 shows that the results Haussmann test had a chi-square result of 2.4067 with p-value of 0.7905. Since the p-value is greater than 0.05, the hypothesis that preferred model is random effect was supported in the current study. In conclusion the random effect is the appropriate model to use for the researchers data since the p-value =0.7905>0.05 significance level.

4.7 Summary of Key findings and Discussions

The Haussman test indicated the suitable model for the data collected was the random effects model. This implied that the error terms are not correlated with the reggressors. It
can therefore be concluded that using the random effects model to explain the effect of the study independent variables on the dependent is appropriate.

In the case of random effects without moderating variable, the model explained the variations at 50.37%. Tax burden was statistically significant factor in explaining financial performance in the model at p-value of 0.011. Asset utilization efficiency was found to be statistically significant in explaining financial performance in the model at p-value of 0.027. Financial Leverage was equally found to be statistically significant factor in explaining financial performance in the model at 0.000. Both interest burden and operating efficiency were statistically insignificant in explaining financial performance in the model at p-values of 0.286 and 0.925 respectively.

In the case of random effects with moderating variable, the model explained the variations at 53.89%. Tax burden was found to be statistically significant factor in explaining the financial performance at a p-value 0.00911. Asset utilization efficiency was found to be statistically factor in explaining performance at a p-value 0.01127. Financial Leverage was also found to be a significant factor in explaining performance at a p-value of 0.0008. Both interest burden and operating efficiency were insignificant in the model at p-values of 0.3326 and 0.7633 respectively.

The moderating factor, investment level was statistically significant in the random effects model with a moderating variable. This led to rejection of the null hypothesis that investment level has no significant moderating effect on financial performance. Investment level was significant factor at p-value of 0.0403.
CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study; conclusions and recommendations based on study findings as well as suggested areas for further study.

5.2 Summary of the research

The focus of this research was to determine the effect of the modified DuPont identity on non-financial firm’s financial performance. This was to be achieved by investigating specific variables in the modified DuPont identity. The objectives of the study was to find out the effect of independent variables which included tax burden, interest burden, operating efficiency, asset use efficiency and financial leverage on the financial performance of 46 non-financial firms listed in the security market. A moderating factor of investment level was included to determine how it affects the developed model. The background of the study was done by studying literature on the situation internationally and nationally. It covered the performance state of the non-financial firms and what other researchers had used to explain the performances.

A comprehensive literature supporting the research was carried out with relevant theories being included. An empirical study was further done to compare related studies.

The research population was 46 non-financial firms listed in the security market. They were all sampled into the study and data collected using approved data collection schedules. The collected data was then analyzed using the R-computer programme.
findings are presented and discussed in chapter four by making use of statistical tables of the computer output.

The data analyzed proved to be a normally distributed data and hence statistical inferences could be drawn from this study. There was negligible multicollinearity of variables and therefore the model was stable. The data trend was also shown as stationary from the unit root test and there was no serial correlation within variables. These diagnostics tests proved that the developed model could be relied on for statistical purposes.

The findings from the Haussmann test revealed that random effects model was the most suited to analyze the data. It’s therefore clear that the error term in the data was not correlated to the repressors within the entity and across the entities. The random effect model developed could explain the variations in ROE at 50.37% without moderating variables and 53.89% with moderating variable.

**5.2.1 Effect of tax burden on financial performance**

On the effect of tax burden on financial performance of nonfinancial firms, the research found that tax burden had a significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in tax burden management would change the ROE of firms by a factor of 0.119, holding other factors constant. In presence of the moderating variable, a unit change in tax burden would change the ROE by a factor 0.1244, holding other factors constant.
5.2.2 Effect of Interest burden on financial performance
The findings of the study on the effect of interest burden on financial performance of non-financial firms, the research study found that interest burden had no significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in interest burden management would change the ROE of firms by a factor of -0.153, holding other factors constant. In presence of the moderating variable, a unit change in interest burden would change the ROE by a factor -01381, holding other factors constant.

5.2.3 Effect of operating efficiency on financial performance
On the effect of operating efficiency on financial performance of non-financial firms, the research study found that operating efficiency had no significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in operating efficiency management would change the ROE of firms by a factor of -0.002, holding other factors constant. In presence of the moderating variable, a unit change in operating efficiency would change the ROE by a factor -0.0056, holding other factors constant.

5.2.4 Effect of Asset utilization efficiency on financial performance
The findings of the research on the effect of Asset use efficiency on financial performance of nonfinancial firms, the research study found that asset use efficiency had significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in asset use efficiency would change the ROE of firms by a factor of 0.176, holding other factors constant. In presence of the moderating
variable, a unit change in asset use efficiency would change the ROE by a factor 0.1368, holding other factors constant.

5.2.5 Effect of financial leverage on financial performance
The findings of the study on the effect of financial leverage on financial performance of non-financial firms, the research study found that financial leverage had significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in financial leverage would change the ROE of firms by a factor of -0.148, holding other factors constant. In presence of the moderating variable, a unit change in interest burden would change the ROE by a factor -0.1347, holding other factors constant.

5.2.6 Effect of Investment Level on financial performance
The findings of the research on the effect of investment level as measured by Tobin q on financial performance of non-financial firms, the research found that investment level had significant effect on the ROE of non-financial firms at 5% significance level. The findings indicated that a unit change in investment level would change the ROE of firms by a factor of -0.1106, holding other factors constant.

5.3 Conclusions
Based on the findings of the study, the following conclusions were drawn.

It was concluded that tax burden management is an important force in corporate financial performance in the non-financial sector. This fact was supported by this study and other previous studies that indeed the cash savings from the tax burden management do affect
the returns of a firm positively. The hypothesized position in the research study was therefore not supported.

Secondly, interest burden management was not an important factor in financial performance of non-financial firms. This fact was indicated by this study which is a signal that the interest burden effect on the non-financial firms is insignificant hence the hypothesis of this study was supported by the current study.

Operating efficiency was equally not a weighty factor in corporate financial performance of these non-financial firms. This is evidenced from the research which further confirms that there is no evidence to reject the null. Operating efficiency effect on the model can only be interpreted as insignificant.

Asset use efficiency was found to be a force in corporate financial performance. This findings support the fact that asset acquisition levels tailored to increase revenue can greatly increase financial performance of non-financial firms. The null hypothesis in the study was therefore not supported in the current study.

Financial leverage was also found to be an important factor in performance of non-financial firms. The use of more financial leverage affected the performance of the firms negatively and the null was also not supported.

Investment level as moderating variable was equally found to affect the performance of these non-financial firms negatively. Accordingly, the null in the study was not supported.
5.4 Recommendations

Finance managers of non-financial firms should actively employ tax planning initiatives to ensure maximum benefits from tax burden management. Engaging in such activities will ensure tax savings hence more returns from investments made. Therefore it promotes achievement of shareholders wealth maximization goal by increasing return on equity.

Corporate and finance executives should maintain interest burden at optimum level to continue benefiting from tax shield otherwise it acts to reduce the return on equity at beyond optimum levels. However, interest burden management has no major statistical significance.

Corporate and finance executives of Non-financial firm’s investment in operating efficiency should be kept at optimum level because it can be shown that it negatively affects return on equity in the current study. However, interest burden management has no major statistical significance.

Corporate and finance executives of Non-financial firms should actively engage in asset use efficiency to increase their returns on equity. Assets utilization efficiency have been shown in this study to improve the financial fortunes of a firm in a significant manner.

Corporate and finance executives of non-financial firms should reverse leverage level from the current level to an optimum level since it has been shown to be affecting the return on equity negatively and significantly.

Finally, Corporate and finance executives of non-financial firms should work on corporate strategy of discouraging overvaluation of the firm because it negatively affects
performance. The investor perception on overvalued firm discourages investors from investing in them. They find alternatives to the corporate products or services and hence affect return on equity of overvalued firms negatively.

5.5 Suggestions for Further Research

The researcher excluded financial firms from the model. Other researchers could consider a model for financial institutions such as lenders and insurance companies. Secondly, some of the non-financial firms have had a strategic unit in the financial sector, other researchers could work on this research and exclude those effects. A comparative study of modified DuPont identity between financial and non-financial firms would add into knowledge base.
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## Appendix I: Data Collection Schedule

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Appendix II: University and Nacosti Approval

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

Internal Memo

FROM: Dean, Graduate School

DATE: 12th November, 2018

TO: John Mutisya Mutua
C/o Accounting and Finance Dept.

REF: USS/OL/CTY/26901/2014

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting of 7th November, 2018 approved your Research Project Proposal for the M.B.A Degree Entitled, “Effect of Modified DuPont Identity on Financial Performance of Listed Non-Financial Companies in Kenya”.

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University’s Website under Graduate School webpage downloads.

Thank you.

ELIJAH MUTUA
FOR DEAN, GRADUATE SCHOOL

c.c. Chairman, Accounting and Finance Department.

Supervisor: Dr. Eddie Simiju
C/o Department of Accounting and Finance
Kenyatta University

EM/em
KENYATTA UNIVERSITY
GRADUATE SCHOOL

Our Ref: D53/OL/CTY/26901/2014

DATE: 12th November, 2018

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR JOHN MUTISYA MUTUA - REG. NO.
D53/OL/CTY/26901/2014

I write to introduce Mr. John Mutisya Mutua who is a Postgraduate Student of this University. He is registered for M.B.A degree programme in the Department of Accounting & Finance.

Mr. Mutisya intends to conduct research for a M.B.A Project Proposal entitled, "Effect of Modified Dupont Identity on Financial Performance of Listed Non-Financial Companies in Kenya."

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
FOR: DEAN, GRADUATE SCHOOL
Ref. No. NACOSTI/P/18/56404/27820

John Mutsiya Mutua
Kenyatta University
P.O. Box 43844-00160
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "Effect of modified Dupont identity on financial performance of listed non-financial companies in 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.

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

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.
Appendix III: Listed companies at Nairobi securities exchange

<table>
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<tr>
<th>Company</th>
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<tbody>
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<td>1. ARM Cement</td>
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<td>2. Atlas African Industries</td>
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<td>3. BOC Kenya</td>
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<td>4. Bamburi cement</td>
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<tr>
<td>5. BAT Kenya</td>
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<tr>
<td>6. Car &amp; General (K)</td>
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<td>7. Carbacid Investment</td>
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<td>8. Centum Investment</td>
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<td>9. Crown Paints</td>
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<td>10. Deacons East Africa</td>
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*Source: NSE, 2017*
Appendix IV: Listed Companies that issued profits warnings in 2015, 2016 and 2017.

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<th>2015</th>
<th>2016</th>
<th>2017</th>
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<td>Bamburi</td>
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<td>Sameer Africa</td>
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<td>Standard Group</td>
<td>Mumias Sugar Company</td>
<td>BOC Kenya</td>
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<td>Shelter Afrique</td>
<td>Deacons East Africa</td>
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<td>ARM Cement</td>
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<td>Car &amp; General</td>
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<td>Nairobi Business Ventures</td>
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Source: NSE, 2017