

**EFFECT OF FINANCIAL LEVERAGE ON THE RELATIONSHIP BETWEEN BOARD
COMPOSITION AND FINANCIAL PERFORMANCE OF FIRMS IN NAIROBI
SECURITIES EXCHANGE, KENYA**

**BY
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**A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY IN BUSINESS ADMINISTRATION**

**DEPARTMENT OF ACCOUNTING AND FINANCE
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DECLARATION

DECLARATION

I declare that this thesis has not been previously submitted and approved for examination or otherwise to the examination body of Maseno University or any other University. To the best of my knowledge and belief, the thesis contains no material previously published, and all sources of theoretical and empirical information have been acknowledged by referencing.

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DEDICATION

This thesis is dedicated to Rosa Jerusa Moraa. Thanks Mama for your pure love!

ABSTRACT

Firms listed at the Nairobi Securities Exchange (NSE) contribute significantly to Gross Domestic Product (GDP), averagely contributing 17.6% annually during the period 2003 to 2017. However, financial performance of listed firms remains poor as evidenced by delisting and suspension of 16% of firms in the same period, which threatens Kenya's economic growth. Although empirical evidence links financial performance to both board composition and financial leverage, results are inconclusive. Prior studies focused on either accounting-based or market-based performance measures indicating that the effect of; board composition on value-added financial performance; financial leverage on value-added financial performance; and of both board composition and financial leverage on value-added financial performance, have not been analysed. The main objective of the study was to analyse the effect of financial leverage on the relationship between board composition and financial performance of firms listed at the NSE. Specifically, the study sought to; establish the effect of board composition on value-added financial performance; analyse the effect of financial leverage on value-added financial performance, and; examine the mediating effect of financial leverage on the relationship between board composition and value-added financial performance of firms listed at the NSE. The Resource Dependency, the Pecking Order, and the Agency Cost theories underpinned the study. Correlational research design was with a census of the 64 listed firms as at December 2014 used. Purposive sampling technique obtained 456 firm-year observations from 2003 to 2014 for 38 firms. Hierarchical fixed effects multiple regression was used to analyse data. Results showed: positive significant effect of both gender diversity ($\beta = 0.2737$, $p = 0.000$) and board size ($\beta = 0.2934$, $p = 0.000$) on value-added financial performance, but negative significant effect of board independence ($\beta = -0.2430$, $p = 0.000$), implying that a unit increase in gender diversity and board size leads to 27.37% and 29.34% increase in value-added financial performance respectively; financial leverage has a negative significant effect ($\beta = -0.4502$; $p = 0.000$) on value-added financial performance implying a unit increase in financial leverage leads to 45.02% reduction in value-added financial performance; financial leverage partially but significantly mediates the relationship between both gender diversity (indirect effect = 0.1730) and board size (indirect effect = 0.1828), and value-added financial performance, implying that a unit increase in gender diversity and board size leads to 17.30% and 18.28% increase in the value-added financial performance mediated by financial leverage respectively. The study concludes: board gender diversity and board size are significant positive predictors of value-added financial performance; increase in financial leverage significantly reduces value-added financial performance; financial leverage mediates the relationship between both gender diversity and board size, and value-added financial performance. It is recommended listed firms at the NSE: increase board sizes and women in boards; finance their investment activities using internal financing; restructure their boards partially based on financial leverage decisions. Findings may be useful to policy makers and academia in structuring board composition elements to create value for firms in NSE.

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ABBREVIATIONS AND ACRONYMS

| | |
|----------------|--|
| ADF - | Augmented Dickey-Fuller |
| BIND - | Board Independence |
| BLUE - | Best Linear Unbiased Estimators |
| BGDIV – | Board Gender Diversity |
| BSZ - | Board Size |
| CEE - | Capital Employed Efficiency |
| CGR - | Corporate Governance Report |
| DER – | Debt-Equity Ratio |
| DR – | Debt Ratio |
| DY – | Dividend Yield |
| EBIT – | Earnings before Interest and Taxation |
| EAC - | East African Community |
| EPS – | Earnings per Share |
| EVA – | Economic Value Added |
| FGLS – | Feasible Generalised Least Squares |
| FLV - | Financial Leverage |
| FAGE - | Firm Age |
| FSIZ - | Firm Size |
| GAAPS - | Generally Accepted Accounting Principles |
| GoK - | Government of Kenya |
| HCE - | Human Capital Efficiency |
| IC – | Intellectual Capital |

| | |
|------------------|---|
| ICR – | Interest Coverage Ratio |
| IPS- | Im, Pesaran and Shin |
| JB - | Jarque-Bera |
| KES - | Kenya Shillings |
| LLC- | Levin, Li and Chiu |
| OLS – | Ordinary Least Squares |
| MBVR - | Market Value of Equity to Book Value of Equity |
| NPV – | Net Present Value |
| NSE – | Nairobi Securities Exchange |
| P/E – | Price Earnings Ratio |
| PDF - | Probability Density Function |
| PLS-SEM - | Partial Least Squares Structural Equations Model |
| RE- | Retained Earnings |
| ROA – | Return on Assets |
| ROE – | Return on Equity |
| ROCE – | Return on Capital Employed |
| ROCI – | Return on Capital Invested |
| ROIC - | Return on Invested Capital |
| SCE - | Structural Capital Efficiency |
| UNEP - | United Nations Environmental Programme |
| UNON - | United Nations Office at Nairobi |
| US - | United States of America |
| VAIC – | Coefficient of Value Added Intellectual Capital Coefficient |

VAP - Value-added financial performance

VIF - Variance Inflation Factor

OPERATIONAL DEFINITION OF TERMS USED IN THE STUDY

Asset Tangibility - The degree to which a firm uses non-current assets in its operations. It is measured by the ratio of non-current (fixed) assets to total assets.

Capital Employed – The total capital harnessed in a firm's non-current and current assets. It is measured as the sum total of the total assets less intangible assets.

Capital Employed Efficiency- The value created by one unit of capital employed. It is measured as the ratio between total value added by a firm in a particular year and the firm's investment in capital employed.

Financial Leverage – The extent to which a firm uses debt capital in its financing. The Debt Ratio (Total liabilities to total assets) measures it in this study.

Human Capital -The collective value of the organization's intellectual capital contained in the competencies, knowledge, and skills of its human resource. It is measured by total salary and wages.

Human Capital Efficiency: This is a measure of the value that a firm creates through one monetary unit invested in its human resources. It is measured as the ratio between total value added by a firm and the firm's investment in human capital (salaries and wages).

Board of Directors – The shareholder' representatives who direct the affairs of a firm. It is measured by the total number of shareholders' representatives elected and appointed to direct the affairs of a firm during a particular year.

Board Composition - The structure of the Board of Directors (inclusive of independent directors) attending the annual meetings held during each fiscal year. It is measured by the size (number of the Board of Directors), Independence (mix between executive and

non-executive directors) and, gender diversity (the number of female directors in the board of directors) during a particular year.

Exchange - This refers to the Nairobi Securities Exchange.

Firm Age - The number of years the firm has existed since incorporation.

Intellectual Capital - The firm's resources that are traditionally not shown in the financial statements. It is measured as the difference between market value of a firm and its book value.

Structural Capital – The competitive intelligence, formulas, information systems, patents, policies and processes resulting from the products or systems the firm has created over time. It is measured by the difference between total value added and human capital.

Structural Capital Efficiency- The value created by one unit of structural capital. It is measured as the ratio between total value added by a firm and the firm's investment in structural capital.

Value Added - The total value generated by a firm. It is measured by the sum total of the depreciation expense, salaries and wages, interest expense, dividends paid, tax expense and retained earnings.

Value-added financial performance: The measure of a firm's financial performance based on use of its total capital; capital employed human capital and structural capital. It is measured by value-added intellectual capital coefficient.

Value Added Intellectual Capital Coefficient – The sum of the capital employed efficiency, human capital efficiency and structural capital efficiency.

CHAPTER ONE: INTRODUCTION

This chapter introduces the concepts of board composition and financial leverage and their relationship with value-added financial performance. The research problem, objectives of the study and the hypotheses that guided the study are presented herein. Similarly, the scope of the study, justification and the conceptual framework of the study are presented in the chapter.

1.1 Background to the Study

The global financial system is one of the most important creations of modern society. Its primary task is to move scarce funds from those who save to those who borrow to buy goods and services and to make investments so that the global economy can grow. Globalisation, deregulated financial markets, privatisation of state corporations and growth in information communication technology have accelerated the development of the financial system. In spite of these developments, huge differences exist between financial markets in the developed countries and the developing countries.

Globally, the focus of management of firms is gradually shifting from profit generation to value addition (Pandey, 2010). In the developed countries such as the United States of America (USA), Britain and Germany, financial markets, and more specifically the securities exchange markets are far much developed. Security exchange markets in the fairly developed countries in the Far East such as Malaysia, India and Pakistan show the exodus from financial measures to value-addition. This is because firms that are value-added oriented have been shown to be more competitive than those that are profit-oriented (Bounfour and Edvinsson, 2004). The need to understand value-added financial performance drivers has therefore been enhanced especially in developing countries like Kenya whose firms seek to compete in the increasingly competitive globalised business world. Moreover, firms in emerging economies such as the Nairobi Securities Exchange

(NSE) face challenges of increased risk due to uncontrolled financial leverages, declining profits, unregulated board compositions and a stifling economic environment, all which threaten value addition (NSE, 2014). Additionally, the firms are relatively small and less diversified as compared to those in the developed economies which exposes them to shocks emanating from uncertainty of policy and macroeconomic environment. These challenges make firms in the NSE unstable in their value-creation abilities hence threatening investor confidence. However, prior literature shows that value addition could depend on both macro-economic factors such as firm industry, and firm specific factors such as board composition and financial leverage.

Board composition refers to the mechanism instituted by firms to achieve a balance and a mix of skills in the highest management body of the firm (Sanda, Mikailu & Garba, 2010). Theoretically, the Resource Dependency Theory has mainly been used to explain the relevance of board composition elements in enhancing firm financial performance. The theory favours larger boards, more independent directors and more women in boards to increase the pool of expertise available to organizations hence improving financial performance (Dalton, Daily, Johnson & Ellstrand, 1999). It is therefore less surprising that in recent years, firms the world over have been pressured by institutional investors and shareholders to appoint directors with different backgrounds and expertise under the theoretical assumption that greater diversity in board composition leads to less insular decision-making and improved financial performance. For example, in Kenya the Capital Markets Authority (CMA) Guidelines on corporate governance practices by listed companies direct that boards of the listed firms should compose effective and all-inclusive independent directors with diverse skills in their pursuit of improved financial performance (Government of Kenya (GoK), 2002). Consequently, board size, board independence and board gender diversity as elements of board composition have been identified as the most important corporate governance

mechanisms that may determine the efficiency of the monitoring function of the board over a firm's top management (Sanda *et al.*, 2010).

The fundamental role of the board size as a component of good corporate governance and its influence on firm financial performance has given rise to a great deal of research. Empirical findings demonstrate conflicting results that however indicate a possibility of board size influencing firm financial performance. For instance, Adams and Mehran (2008), Belkhir (2009), Abidin *et al.* (2009), Bermig, and Frick (2010) show that board size has a positive statistically significant effect on firm financial performance. However, their studies notably focus on accounting-based financial performance measures such as Return on Assets (ROA) and Return on Capital Employed (ROCI), which do not measure value creation abilities of the firms. Moreover, either conveniently selected samples that introduce bias or cross-sectional data are used implying that the cause-effect was not established. Other studies (Amran, 2011; Adusei, 2011; Obradovich and Gill, 2013; Ongore, K'Obonyo, Ogutu & Bosire, 2015) established a negative significant effect of board size on firm financial performance. However, Amran (2011) focused on family-controlled firms while Adusei (2011) focused on banks. Ongore *et al.* (2015) focused on firms listed at the NSE but used the pooled Ordinary Least Squares (OLS) methodology hence the long-run effect of board size on value-added financial performance was not established. Obradovich and Gill (2013) studied firms listed at the New York Stock Exchange (NYSE). Elsewhere, Garba and Abubakar (2014) using insurance firms and Dunstan *et al.* (2011) who analysed manufacturing listed firms in New Zealand using pooled OLS reported non-linear relationship between board size and financial performance.

The effect of board independence on financial performance has also received considerable attention empirically with Abidin *et al.* (2009), Mahmudi, and Nurhayati (2014) showing that

board independence enhances financial performance. Mahmudi and Nurhayati (2014) only sampled listed banks in Indonesia therefore their findings cannot be generalised to other populations. On the other hand, Abidin *et al.* (2009) used cross-sectional data. The researchers who established a negative but significant effect of board independence on firm financial performance include Horvath and Spirollari (2012), Al-Musalli and Ismail (2012), Garba and Abubakar (2014), Ongore *et al.* (2015) and Chemweno (2016). However, all their studies are based on small samples indicating that the results were cautiously interpreted. Moreover, Horvath and Spirollari (2012) studied listed firms in the USA while Al-Musalli and Ismail studied banks in the Middle East. Differences however exist between the smaller and less-diversified firms in NSE and those in the more developed securities exchange. Piri and Nateghian (2015) studied 92 companies listed at the Tehran Stock Exchange and showed no significant relationship between board independence and firm financial performance.

Gender representation in boards has been shown to vary by country with those countries where affirmative action is already in place having a higher representation of female directors (Wachudi and Mboya, 2012). Despite this, there seems to be inconsistent findings in scientific research on the effect of board gender diversity in influencing firm financial performance. For instance, while Rose (2007), Wachudi and Mboya (2012), Horvath and Spirollari (2012) and Leting *et al.* (2012) reported findings that showed no statistically significant effect of board diversity on financial performance, Dunstan *et al.* (2011), Garba and Abubakar (2014) and Ongore *et al.* (2015) showed that gender diversity positively and significantly explain why firm differ in financial performance. Wachudi and Mboya (2012) sampled commercial banks in Kenya indicating that firms from other sectors are not studied, while Leting' *et al.* (2012) studied listed firms at the NSE but used OLS to analyse data. The use of OLS does not allow for the control of unobserved firm effects.

Additionally, all these studies use accounting-based financial performance measures or market-based financial performance measures that do not measure the future value-creation abilities of the firms.

Reviewed literature indicates that board composition proxies of board size, board independence and board gender diversity may influence firm financial performance albeit unsystematically. However, most prior studies use conveniently selected firm-specific cross-sectional data that limits the generalization of findings to all listed firms at the NSE. Additionally, most of the studies focus mainly on accounting-based and market-based performance measures that do not reflect the true value of total company's assets due to their exclusion of intellectual capital. None of the studies has incorporated value-based performance measures for all listed firms in emerging economies such as Kenya. Therefore, the effect of board composition on value-added financial performance of firms listed at the Nairobi Securities Exchange has not been established.

According to Pandey (2010), financial leverage is the existence of debt in a firm's capital structure. The importance of financial leverage decisions can be traced to their intense interrelationships with other financial decisions, which can affect a firm's returns as well as informing its ability to compete (Javeed *et al.*, 2014; Ramli and Nartea, 2016). Since the pioneering work of Modigliani and Miller (1958) in their Capital Irrelevancy Theory, the theory of financial leverage and its influence on firms' financial performance has been an issue of great concern in corporate finance. Kraus and Litzenberger (1973) introduced the tax advantage of debt and bankruptcy penalties into a state preference framework and developed the Trade-off Theory that predicts that target debt ratios will vary from firm to firm. According to Berzkaine and Zelgave (2015), companies with safe, tangible assets and plenty taxable income ought to have high debt target ratios while companies with risky, intangible assets ought to rely on equity financing. The most important goal

of this theory lies in the interpretation of reality that companies finance their needs of capital through a combination of debt and equity funds without complete dependence on a single source. Under this theory, there is an advantage of financing through debt that is the tax shield, and there is a cost of financing through debt, which is the interest paid, and the costs of financial distress of the possibility of bankruptcy of the company. Within this notion, companies seek to reach an optimal capital structure by balancing between the benefits and the costs of each source of funds.

Despite numerous empirical tests examining the interaction between financial leverage and firm financial performance, unanimity is not arrived at. However, plausible relationships are demonstrated. Berger and Udell (2006) using a sample of listed banks in the United States of America, Javeed, Hassan and Azeem (2014) in an analysis of non-financial listed firms in Pakistan and Akhtar, Javeed, Maryam and Sadia (2012) who studied fuel and energy sector firms in Pakistan showed positive statistically significant effect of financial leverage on firm financial performance. The studies are however sector-based, hence biased. Laurent (2002) and Mule and Mukras (2015) reported mixed findings with their studies using accounting-based financial performance measures. Moreover, the use of cross-sectional data by Laurent (2002) indicates spurious results. At the other extreme, Tian and Zeitun (2007) who studied firms in Jordan, and Maina and Ishmael (2014) using firms in the NSE showed that firms might improve their financial performance by reducing their levels of financial leverage. The main drawback of these studies is that they focused on either accounting-based or market-based financial performance measures that do not show future value-creation abilities of the firms.

The empirical financial leverage literature reviewed shows the importance of financial leverage in enhancing financial performance for firms. However, it is demonstrated that the effect of financial leverage on value-added financial performance has received little attention. Reviewed studies

focus on either accounting-based or market-based performance measures that are becoming less useful in the knowledge-based globalized markets. Additionally, most of the studies use cross-sectional data and sector-based samples. While studies conducted on the NSE attempt to link financial leverage to firm financial performance, no market-wide study has been conducted in the context of value-added financial performance. The effect of financial leverage on value-added financial performance has therefore not been analysed in the context of firms in the NSE. The present study sought to fill this gap by analysing the effect of financial leverage on value-added financial performance for an emerging market.

Agency Cost theorists propose that agency cost is one of the determinants of financial leverage, which in turn could have an influence on firm financial performance (Hasan and Butt, 2009). Grossman and Hart (1986) argue that financial leverage decisions can reduce conflict between managers and shareholders by influencing decisions made by managers. Moreover, corporate governance practices such as board composition are structured to alleviate agency cost issues by influencing financial leverage (Abidin *et al.*, 2009). The composition of the board on the other hand, may influence financial leverage levels in different ways. One way in which a board may monitor managers is by encouraging them to uptake high financial leverages which will increase the managers' desire to invest in positive Net Present Value (NPV) projects. In this way, board composition and financial leverage decisions may influence firm financial performance by mitigating agency conflicts (Ramli and Nartea, 2016). From the foregoing, it is evident that both financial leverage and board composition may affect firm financial performance. What is not clear however is whether financial leverage mediates the relationship between board composition and value-added financial performance.

Studies examining the mediating role of financial leverage show that financial leverage could mediate various relationships. Okiro *et al.* (2015) studied firms listed at the East African securities markets using the traditional accounting-based measures of ROA and ROE as proxies for financial performance. They reported significant mediating effect of financial leverage on the relationship between general corporate governance practices and firm performance. Ramli and Nartea (2016) studied firms in Malaysia using Partial Least Squares Structural Equation Model (PLS-SEM) methodology and reported that the effect of some macro-economic factors such as growth opportunities and liquidity on firm performance is mediated by financial leverage. The studies however focused on accounting-based financial performance therefore indicating that the mediating effect of financial leverage on the relationship between board composition and value-added financial performance of firms listed at the NSE has not been examined.

The Nairobi Securities Exchange is the single major open capital market in Kenya from which listed firms gain access to long-term finance (Mule and Mukras, 2015). The listed firms are important drivers of the economy with the listed firms averagely contributing 17.6% of revenue to Gross Domestic Product (GDP) annually during the period 2003 to 2017 (NSE, 2018). Despite the important contribution to Kenya's GDP, financial performance of the listed firms has generally remained comparably low (Abeysekera, 2010; Maina and Ishmail, 2014; Mule and Mukras, 2015). During the period 2003 to 2014, Unilever Tea (K), Access Kenya, CMC Holdings, BOC, Carbacid, Uchumi, A. Baumann, Rea Vipingo and Hutchings Biemer were either delisted, suspended or moved out from the bourse awaiting mergers (NSE, 2015). This represents 16% of initially listed firms. Reports further indicate that several economy-driving firms such as Kenya Airways have continued reporting reducing profitability (NSE, 2015).

Empirical investigation (Abeysekera, 2010; Leting' *et al.*, 2012; Wachudi and Mboya, 2012; Maina and Ishmail, 2014; Mule and Mukras, 2015) indicate that firms listed at the NSE face challenges which exposes them to shocks emanating from uncertainty of policy and macroeconomic environment. The studies have ineffectively addressed these challenges by focusing on either general corporate governance practices, investor apathy, or stiff competition from the developed markets. The use of accounting-based and market-based financial performance measures has been another draw-back of all these studies. Moreover, studies conducted on the role of board composition on firm financial performance have implicitly assumed that this relationship is direct. An alternative perspective that the relationship can be mediated by contextual variables such as financial leverage has not been explored. The mediating role of financial leverage on the relationship between board composition and value-added financial performance for firms in the Nairobi Securities Exchange has not therefore been analysed.

1.2 Statement of the Problem

The Nairobi Securities Exchange is the single major open capital market in Kenya from which listed firms gain access to long-term finance. The listed firms are important drivers of the economy to which they contributed averagely 17.6% of revenue annually to Gross Domestic Product (GDP) during the years 2003 to 2017. Despite the important contribution to Kenya's GDP, financial performance of the listed firms has generally remained poor evidenced by delisting, suspension or moving out of 16% of the firms during the period 2003 and 2014. This indicates poor financial value-addition that threatens economic growth. Empirical evidence demonstrates plausible but inconsistent relationships between board composition and value-added financial performance. Previous studies testing the association between board composition and firm financial performance and financial leverage and firm financial performance for firms listed at the NSE focus on either

the accounting-based or market-based performance using cross-sectional data on sector-based samples. The effect of either board composition or financial leverage on value-added financial performance has not been analysed in the context of the listed firms. Moreover, studies examining the role of board composition on financial performance of the firms inherently assume that this relationship is direct. Little attention has also been given to the mediating role of contextual variables such as financial leverage on the direct relationship between board size and value-added financial performance using panel-data methodologies. Therefore, this study sought to analyse the mediating effect of financial leverage on the relationship between board composition and financial performance for firms in the Nairobi Securities Exchange, Kenya.

1.3 Objectives of the Study

The main purpose of this study was to analyse the effect of financial leverage on the relationship between board composition and financial performance of firms listed at the Nairobi Securities Exchange (NSE), Kenya.

The specific objectives were to:

- (i) Establish the effect of board composition on value-added financial performance of firms listed at the NSE;
- (ii) Analyse the effect of financial leverage on value-added financial performance of firms listed at the NSE;
- (iii) Examine the mediating effect of financial leverage on the relationship between board composition and value-added financial performance of firms listed at the NSE.

1.4 Research Hypotheses

H₀₁: Board composition has no effect on value-added financial performance among firms in the NSE;

H₀₂: Financial leverage has no effect on value-added financial performance among firms listed in the NSE.

H₀₃: Financial leverage has no mediating effect on the relationship between board composition and value-added financial performance of firms in the NSE.

1.5 Scope of the Study

The scope of this study is evaluated in terms of subject, area and time. In terms of subject scope, the study is limited to the broad field of finance and the subfields of corporate governance and financial leverage. According to Pandey (2010), corporate governance refers to the broad mechanisms through which firms are governed with the purpose of achieving financial goals. Financial leverage is borrowed from the wide field of capital structure, which refers to the ways the firms are financed (Rehman, 2013).

The study was conducted in the Nairobi Securities Exchange (NSE) located in Nairobi City, the capital city of Kenya. There were sixty four companies listed in the NSE as at December 2014, 42 of which had been continuously listed for period of study. The research was limited to the period January 2003 to December 2014. Selection of the base year 2003 was informed by three main reasons. Firstly, it coincided with the beginning of the new administration of National Rainbow Alliance Coalition (NARC) that initiated aggressive fiscal expansion in Kenya after the 24 years rule of Kenya African National Union (KANU). The wide fiscal reforms affected the NSE, which was put under new corporate scrutiny through regulations such as the Guidelines on corporate governance practices by listed companies in Kenya (GoK, 2002) on board composition. The effect of the Guidelines was therefore expected to be reflected in the board compositions of the firms. Secondly, the new government increased access to credit. Thus, the performance of firms was expected to reflect better economic risk and sovereign risk environments as well as improved

access to funding because these economic reforms were expected to make a wider range of financing instruments available to businesses.

One reason informed the selection of the year 2014 as the terminal study period. The NSE recorded the lowest financial performance in several dimensions in 2014 (Chemweno, 2016). For instance, the KES market capitalization percentage change dropped from 51.0% in 2013 to 19.9% to -10.9% in 2014 and 2015 respectively. It was hypothesised that this poor performance could have resulted from board composition and financial leverage decisions.

1.6 Justification of the Study

The present study was necessary because before the study, the effect of financial leverage on the relationship between board composition and financial leverage for firms listed in the NSE had not been analysed. The study findings may contribute to practice and literature in a number of ways. First, it is believed that the study has broken the ground in studies relating to the combined role of board composition and financial leverage on value-added financial performance among firms listed at the NSE. This understanding will help policy makers such as market regulators to understand the variables that drive efficiency among listed firms in Kenya and therefore help to align board composition and financial leverage decisions to the important drivers of efficiency.

Second, unlike previous studies that examined firm performance using accounting-based and market-based financial performance measures, the use of value-added financial performance measures will help shareholders to measure firm performance using future oriented measures which will in turn inform their investment decisions. Third, by using VAIC to measure firm performance and examining whether it is associated with board composition and financial leverage, management will better understand factors influencing value-addition in the listed firms

which will help increase their competitiveness in the increasingly globalized economy. Fourth, academicians may find results from this study useful in forming a basis for future theory development in the fields of board composition, financial leverage and value-added financial performance.

1.7 Conceptual Framework

This study will be based on a conceptual framework shown in Figure 1.1 below.

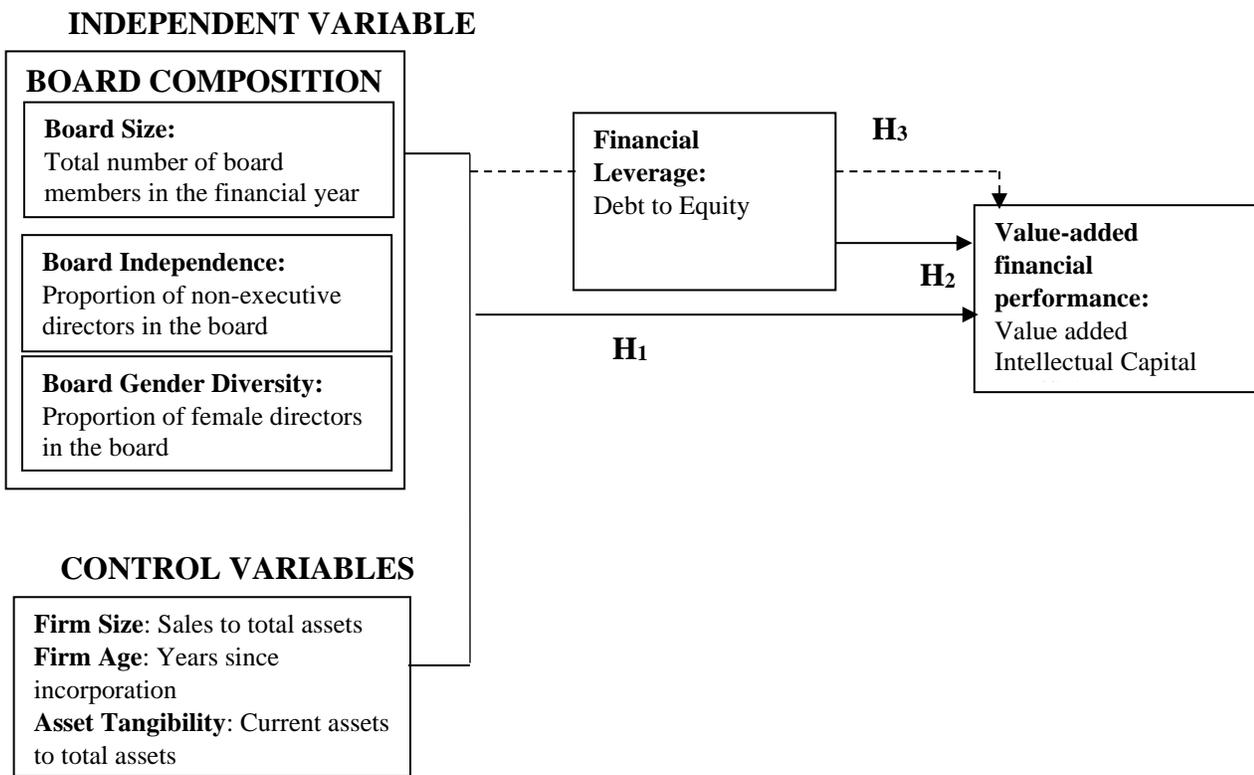


Fig. 1.1: The Mediating role of Financial Leverage on the Relationship between Board Composition and Value-added Financial Performance

Source: Adapted from Ramli and Nartea (2016)

The conceptual framework is adapted from Ramli and Nartea (2016) and modified to suit the research purpose. Ramli and Nartea (2016) investigated the mediating effect of financial leverage measured by both market and book value on the relationship between firms' macro-economic

attributes and financial performance. The study is therefore relevant in conceptualizing the present study. The modification of Ramli and Nartea's (2016) model in the present study lies in the operationalization of board composition. In this study, board composition was specifically chosen to replace the wide micro-economic and firm-specific factors in Ramli and Nartea's (2016) model. Board composition is operationalized as board size, board independence and board gender diversity, while financial leverage is operationalized as the proportion of total liabilities to total assets. The choice of financial leverage as a mediator variable is motivated by the agency cost theory which proposes that financial leverage can mitigate agency conflicts therefore influencing firm financial performance.

Ramli and Nartea (2016) measure firm financial performance using the market-based Tobin's Q. This is modified in the present study to the value-added financial performance measure VAIC. This is informed by previous studies (Muhammad and Ismail, 2009; Pulic, 2000; Britto *et al.*, 2014) which indicate that firms that are value oriented are more profitable. Three control variables firm size, firm age and asset tangibility are introduced in the reconstructed conceptual framework.

Firm size (FSZ) is used as control variable in this study since is a relevant variable that could confound the relationship between board composition and value-added financial performance (Ho and Wong, 2001). Moreover, Wahba and Elsayed (2015) indicate that large firms are likely to have more resources that could enhance a firm's ability to determine its board composition elements. Firm size has been related to existence of economies of scale inherent in investments and therefore could influence firm financial performance. Additionally, the size of a firm is related to the risks and costs of bankruptcy. According to Ayot (2011), larger firms are more diversified and are therefore prone to lesser risk of bankruptcy leading to better financial performance.

Firm age (FAGE) is used as a control variable since board composition elements are rooted in time (Elsayed and Wahba, 2013). Further, controlling for firm age is important because older firms have financial leverage decisions at the centre stage which may influence firm performance. Asset tangibility (TANG) has also been shown to influence both financial leverage and firm performance (Hasan and Butt, 2009).

CHAPTER TWO: LITERATURE REVIEW

In this chapter, the theoretical and empirical literature on the key study variables is reviewed. The literature review more precisely examines the existing theoretical and empirical literature on board composition, financial Leverage and value-added financial performance with the view of crystallizing the research gaps.

2.1 Theoretical Literature Review

According to Creswell and Plano (2007), a theory is an interrelated set of constructs formed into prepositions or hypotheses that specify the relationship among variables in terms of magnitude and direction, and which helps to explain or predict phenomena that occurs in the world. The theories that underpin the relationship between board composition and firm financial performance, financial leverage and value-added financial performance, and the combined role of board composition, financial leverage and firm financial performance are explained in the sub-sections below.

2.1.1 Resource Dependency Theory

Pfeffer and Salancik (1978) postulated the Resource Dependency Theory. Additional scholars who have contributed to the theory include; Gales and Kesner (1994), Dalton *et al.* (1994), and Hillman and Dalziel (2003). These researchers posit that when an organization appoints an individual to a board, it expects the individual will come to support the organization, will concern himself/herself with its problems, will variably present it to others, and will try to aid it. They therefore view board of directors as providers of resources such as legitimacy, which aids performance.

According to Hillman and Dalziel (2003), resource dependence logic suggest that a board's provision of resources is directly related to firm performance. According to them, the resources brought to the firm by directors help to reduce dependency between the organization and external

contingencies, diminish uncertainty for the firm, lower transaction costs, and ultimately aid in survival of the firm. All these help in improving firm performance.

Rehman (2013) asserts that the primary concern of scholars who have used the Resource Dependency theory is board capital, which consists of both human capital (experience, expertise and reputation), and relational capital (network of ties to other firms and external contingencies). This is because the board of directors form part of the firm and its environment and therefore provide information and resources for the company to protect it from environmental uncertainty. Therefore, individual members of the board of directors with different backgrounds provide an important resource for the company to increase financial performance.

One important issue that has been related to the structure and functions of board according to resource dependency theory is board composition. As observed by Carter *et al.* (2003), board composition refers to the distribution of differences between members of the board relating to the characteristics of the differences in attitudes and opinions. According to Ingley and Van der Walt (2003), board composition is the combination of qualities, characteristics, and different skills of individual members of the board in relation to decision-making and other processes in the firm's board. Carter *et al.* (2003) opine that composition of the board of directors can be differentiated between observable demographic diversity attributes such as gender, age, race, and nationality, as well as non-observable cognitive attributes such as expertise and experience.

Empirical studies that have based their theoretical underpinnings on the Resource Dependency Theory such as Carter *et al.* (2003) and Rasmini *et al.* (2014) seem to agree that the presence of higher gender composition, size and their independence is an important issue that managers, directors, and shareholders in the modern firm are concerned with. Carter *et al.* (2003) assert that

board composition should be considered when assessing the effectiveness of corporate decision-making. This seems to imply that board composition elements form important ingredients when assessing firm performance.

Rasmini *et al.* (2014) note that diverse boards increase variability of cognitive style, which further enriches the knowledge, wisdom, ideas and approaches available to the firm's board, and therefore ultimately improving the quality of decision making. Greater diversity in board composition provides more diverse opinions and alternative problem solving approaches because of the heterogeneous perspectives of individual board members. In addition, diversity in board composition could also provide unique characteristics for companies that can create additional value for shareholders and enhance corporate value (Carter *et al.*, 2003).

This theory seeks to identify the choices of practices that may help a firm improve its performance in respect of board composition and specifically board size, board gender diversity and board independence. The theory therefore helps to examine the direct relationship between board composition elements and firm value-added financial performance.

2.1.2 Trade-Off Theory

The original version of the Trade-off theory grew out of the debate over the Modigliani-Miller Irrelevance theorem. Kraus and Litzenberger (1973) formally introduced the tax advantage of debt and bankruptcy penalties into a state preference framework (Ramadhan, 2015). The Trade-off theory predicts that target debt ratios will vary from firm to firm. According to Berzkaine and Zelgave (2015), companies with safe, tangible assets and plenty taxable income ought to have high debt target ratios while companies with risky, intangible assets ought to rely on equity financing. The most important goal of this theory lies in the interpretation of reality that companies finance

their needs of capital through a combination of debt and equity funds without complete dependence on a single source. Under the theory, there is an advantage of financing through debt which is the tax shield, and there is a cost of financing through debt which is the interest paid and the costs of financing distress of the possibility of bankruptcy of the company. Within this fact, companies seek to reach to the optimal capital structure by balancing between the benefits and the costs of each source of funds (Berzkaine & Zelgave, 2015).

This school of thought, which argues for the existence of an optimal capital structure, incorporates various imperfections to capital markets ignored by the Modigliani and Miller (1958) hypotheses, but retaining the assumptions of market efficiency and symmetric information. Thus, although increasing financial leverage might enable a firm to increase its value by profiting from tax shields on debt (Modigliani and Miller, 1963), higher financial leverage might lead to higher expected direct and indirect financial distress costs, which decrease the firm's value (Ross *et al.*, 2002). According to the trade-off theory, therefore, the optimum financing mix coincides with the level of financial leverage at which the benefits and costs of debt financing are exactly balanced. The trade-off theory of leverage assumes that there are benefits to leverage within capital structure used until an optimal capital structure is attained. The theory recognizes that (tax benefit) debt interest is tax deductible. This reduces the tax liability thus increasing tax shield. A high proportion of debt in a company makes it very risky for investors to invest in it. This make to demand investors a high premium on stock or high dividend. The theory assumes that a firm has an optimum capital structure based on trade-off between costs and benefits of using debt. This theory does not explain the conservative nature of firms when using debt finance, why leverage is consistence in most countries yet they have divergent taxation systems (Popescu, 2009). Firm's optimal debt ratio is determined by a trade-off between the bankruptcy cost and tax advantage of borrowing and it is

achieved at the point when the marginal present value of the tax on additional debt is equal to the increase in the present value of financial distress costs (Owalobi and Anyang, 2013).

This theory will link financial leverage to firm financial performance since firms in Kenya have been shown to follow capital structures that seek optimal use of debt (Mule & Mukras, 2015).

2.1.3 Agency Cost Theory

Jensen and Meckling (1976) gave this theory a rigorous theoretical underpinning. Fama and Jensen (1983), Grossman and Hart (1986), Bainbridge (1993) and Miller (1993) are some of the researchers who have contributed to the development of the theory. The theory proposes that both board composition and financial leverage decisions influence firm financial performance by mitigating agency conflicts.

As asserted by Miller (1993), Agency Cost theorists see the primary role of boards as monitoring the actions of the agents (managers) to protect the interests of the principals (owners). Similarly, legal and finance scholars emphasize the fiduciary responsibilities of directors to ensure that managers are acting in the interest of shareholders. Monitoring by the board is important because of the potential costs incurred when management pursues its own interests at the expense of the shareholders' interests. According to Hillman and Dalziel (2003), when ownership and control are separated, managers may pursue their self-interest at the expense of value addition, therefore creating agency costs. The agency costs arise from the principal's monitoring of expenditures incurred by agents, bonding costs arising from drawing up contractual agreements between the principal and the agent, and the resultant residual loss.

Hasan and Butt (2009) observe that one way through which boards can monitor the activities of management is by forcing management to uptake high levels of financial leverage. They argue that

high levels of financial leverage reduce agency costs since conflict between managers and shareholders are reduced when managers are torn between investing in projects with positive Net Present Value (NPV) and consuming perks. Since excessive consumption of perks is likely to bankrupt the firm and by extension job losses for managers, high levels of financial leverages entices managers to make better investment decisions and consume less perks hence improving firm financial performance. It therefore implies that financial leverage decisions made by boards in their monitoring efforts can reduce conflicts between managers and shareholders by influencing decisions made by managers.

While the Agency Cost Theory has yet to be unequivocally supported, it provides a suitable theoretical basis for the present study by linking board composition, financial leverage and firm financial performance since it proposes that agency cost is one of the determinants of financial leverage, which in turn could have an influence on firm financial performance.

2.1.4 The Concept of Board Composition

The independent variable in this study is board composition. According to Hasan and Butt (2009), the board of directors is highest body of a company that is responsible for managing the firm and its operation by formulating policies. It is part of the broader concept of corporate governance, which is the process and structure used to direct and manage business affairs of firms toward enhancing prosperity and corporate accounting with the ultimate objective of realizing shareholders' long-term value while taking into consideration the interest of other stakeholders (GoK, 2002).

Board composition refers to the mechanisms employed by firms to harness the knowledge, skills, experience and resources required to achieve a firm's objectives. According to Mallin (2007), board composition may play a vital role in strategic decisions regarding financial leverage and

especially through the component of board size, board independence and board gender diversity. Moreover, the CMA Guidelines on corporate governance practices by listed companies in Kenya require that an effective board to offer strategic guidance, to lead and control the company and to be accountable to its shareholders, lead every listed company (GoK, 2002). An efficient monitoring board will therefore be subject to certain size and mix restrictions that result from the constraints that apply to effective deliberation and communication within groups (Essen *et al.*, 2011). Three proxies for board composition have featured prominently in empirical research; board size, board composition and board gender diversity.

The debate on whether large boards are desirable or not has dominated both theoretical and empirical research. Proponents of large boards have advanced the argument that a board of directors is an essential mechanism that enhances and creates the coalitions with the stakeholders through the unique and different experiences, attachments and points of view brought to the board by different board members (Westphal and Milton, 2000). As asserted by Bradbury *et al.* (2006), firms with a greater number of directors on the board tend to have high earnings quality. However, proponents of smaller boards opine that larger boards are posited to be less flexible and less efficient due to higher coordination costs and less effective communication (Core *et al.*, 2008). Additionally, larger board sizes result in an agency problem; lack of effective communication and coordination; and the inability of the board to control management making opportunistic managers make sub-optimal decisions.

The CMA Guidelines on corporate governance practices by listed companies in Kenya (GoK, 2002) prescribe that board of listed firms should compose of a balance of executive directors and non-executive directors including at least one third independent non-executive directors with diverse skills or expertise to offer strategic guidance to the firms. Board independence is an

important board composition element and has therefore received considerable attention both in research and practice. Researchers who propose high board independence levels such as Chen and Jaggi (2000) assert that a larger proportion of non-executive directors on the board enhances board monitoring performance with firms with a higher level of board independence being less likely to engage in earnings management. On the contrary, independent directors have theoretically been shown to prefer conservative business strategies in order to protect shareholders which in the end may lead to poor financial performance. Furthermore, outside directors are more unlikely to align their decision-making processes with shareholders than management.

Because of growing equality between genders, gender composition of the board has become one of the most significant issues in finance and economic literature. Extant research provides theoretical arguments that the inclusion of women on the board benefits the board performance in various ways. For instance, Robinson and Dechant (1997) argue that women provide different perspectives to board decision-making, better understanding of the marketplace, increased creativity and innovation, improved problem-solving skills and organizational flexibilities. Similar arguments have been advanced by agency theorists who posit that gender diversity enhances the board's ability to monitor top management since women tend to ask more questions than male directors do (Carter *et al.*, 2003). However, proponents of less gender diverse boards argue that women are risk-averse and will most likely make sub-optimal decisions (Earley and Mosakowski, 2000). A further reason supporting the observation that greater board gender diversity is related to lower firm financial performance can be found in arguments by Cox and Blake (1991) who observe that women are more risk-averse than men. Additionally, they increase the costs of the firm because of higher turnover and absenteeism.

2.1.5 The Concept of Financial Leverage

Financial leverage can be described as the extent to which a firm is using debt financing in its capital structure (Pandey, 2010). It therefore implies that as debt financing increases, financial leverage increases. Financial leverage has a relationship with financial performance of firms although this relationship is unsystematic. However, the relationship between leverage and a firm's financial performance has been a central point in addressing the agency cost problem (Ramli and Nartea, 2016). The financial leverage employed by a company is intended to earn more on the fixed charges funds than their costs. The primary motive of a company in using financial leverage is to magnify the shareholders' return under favourable economic conditions. The role of financial leverage in magnifying the return of the shareholders' is based on the assumptions that the fixed-charges funds can be obtained at a cost lower than the firm's rate of return on net assets (Rehman, 2013).

2.1.6 The Concept of Value-Added Financial Performance

The rise in value-based financial performance measures has been propagated by the need to replace the accounting-based and market-based financial performance measures. Traditionally, measures of firm financial performance have been based on accounting and/or market values that merely focus on physical capital in measuring firm performance. The accounting-based measures have also been criticized since they reflect historical values that may already have lost their actuality due to restrictions by accounting conventions. With the advent of the knowledge-based economy, intellectual capital rather than physical capital becomes the main factor driving firm value. This is especially true for firms in the developing countries that seek to compete in the globalised economy.

Proponents of value-based firm performance measures argue that the accounting-based and market-based financial performance measures are not sufficient for the evaluation of firm performance since they are based on financial statements that do not reflect true value of total company's assets due to their exclusion of intangible assets and intellectual capital (Vergauwen and Van Alem, 2005). Furthermore, the accounting-based financial performance measures have been found to lack the potential to determine the fair value of either tangible or intangible firms since they measure past value creation abilities by firms unlike value based measures that show future value (Britto *et al.*, 2014).

It has been empirically shown that firms in which value-added managing strategies have been implemented have been successful in improving their productivity and efficiency (Pulic, 2000). Consequently, value-based performance measures such as Economic Value-Added (EVA), Balanced Scorecard, Intangible Assets Monitor, Calculated Intangible Value and Value-Added Intellectual Capital (VAIC) have been developed to measure value-creation abilities of firms. Even though these models are ultimately motivated by the drive to improve overall business performance in the knowledge economy, VAIC has been widely accepted as adopted since it measures value creation from the stakeholders' point of view.

The VAIC model (Pulic, 2000) uses information from financial statements of a firm to calculate the efficiency coefficient on three types of capital; human, structural and capital employed. Human capital refers to the collective value of the organization's intellectual capital embedded in competencies, knowledge, and skills of its human resource. This capital is the organization's constant renewable source of creativity and innovativeness, which is not reflected in its financial statements (Muhammad and Ismail, 2009). Structural capital includes the competitive intelligence, formulas, information systems, patents, policies and processes arising from the products or systems

created by the firm over time. The intellectual value remains with the enterprise when people leave. Capital employed on the other hand can be defined as total capital harnessed in a firm's fixed and current assets.

2.1.7 Relationship between Board composition, Financial Leverage and Firm Performance

Previous studies (Hasan and Butt, 2009; Kajanathan, 2012; Njuguna and Obwogi, 2015) generally agree that the relationship between board composition and financial leverage is plausible. However, these studies implicitly assume that the relationship is direct. The alternative view that the relationship can be mediated by contextual aspects such as financial leverage has received minimal attention. Financial leverage has empirically been shown to mediate various relationships (Okiro *et al.*, 2015; Ramli and Nartea, 2016). Based on the Resource Dependency Theory that hypothesises that firm financial performance can be enhanced from resources brought in from the board of directors, it is therefore expected that financial leverage will mediate the relationship between board composition and value-added financial performance.

2.2 Empirical Literature Review

This section reviews empirical literature on the variables of the study; board composition and firm financial performance; board size and financial leverage, and; financial leverage and firm performance.

2.2.1 Effect of Board Composition on Financial Performance of Firms

The effect of board composition on firm financial performance has been one of the most-studied aspect in theory and practice of corporate finance. Theoretical and empirical research on this area was originally motivated by the separation of ownership from management and its consequential

effect of the agency theory. Research into the topic has however largely yielded unsystematic results leading to theory stagnation.

Adams and Mehran (2008) analysed the relationship between board governance and bank performance using data that spanned thirty-four years for 35 large, publicly traded bank holding companies in the United States of America (USA). The study examined the relationship between board independence and board size, and performance as proxied by Tobin's Q. Using the fixed-effects regression model, the study found that board independence is not related to bank performance, while board size, regardless of how it is measured, was found to be positively related to Tobin's Q ($\beta = 2.39$; $p = 0.024$). The study however used market-based performance measure; the effect of board governance on value-added financial performance was therefore not established.

In another panel study in the USA on the relationship between board size and firm performance using a sample of 174 United States bank and savings-and-loan holding companies for the period 1995-2002, Belkhir (2009) reported a positive and significant relationship between board size and performance, as measured by Tobin's Q ($\beta = 1.98$; $p = 0.029$; $R^2 = 0.6966$) and the Return on Assets (ROA) ($\beta = 2.36$; $p = 0.024$; $R^2 = 0.4850$) indicating that increasing the number of directors in banking firms does not undermine performance. Similarly, Obradovich and Gill (2013) empirically examined the impact of corporate governance for three years on the value of 333 American listed firms using correlational and non-experimental research design and multiple regression analysis and show that larger board size negatively ($\beta = -0.219$; $p = 0.04$; $R^2 = 0.238$) impacts the value of American firms measured by Tobin's Q. While these studies show inconsistent results on the role of board composition on firm performance, none used value-added financial performance to measure firm value; Adams and Mehran (2008) and Obradovich and Gill

(2013) used the market-based Tobin's Q only while Belkhir (2009) uses accounting-based ROA in addition to Tobin's Q.

Horvath and Spirollari (2012) also studied listed firms at the NYSE in the USA while examining the relationship between selected board of directors' characteristics and financial performance measured by Price-to-Book Ratio for 136 listed firms during the period 2005 to 2009. The study reported an average board independence of 85% for the firms, a board size mean of 10.78 and average women directors of 1.46. While controlling for a set of financial variables and using the fixed effects model, the study generally found that corporate governance characteristics matter for a firm's financial performance. However, results indicated that independent directors significantly reduce firms' financial performance ($\beta = -0.540, p = 0.0172$). Moreover, board gender diversity was found to have an insignificant effect on performance ($\beta = 0.7140, p = 0.496$) while board size was shown to have a negative insignificant effect on financial performance ($\beta = -0.149, p = 0.257$). The study however used a short longitudinal period of five years suggesting that the longer-term effect of board characteristics on financial performance was not effectively elucidated.

In Europe, Bermig and Frick (2010) demonstrate experiences of the relationship between board composition and firms' financial performance from European firms in an empirical study on the effects of board size and composition on the valuation and performance of all 306 German listed firms over the period 1998-2007. Performance of firms in the study was measured using Tobin's Q, Return on Equity (ROE) and Return on Invested Capital (ROIC). By using the fixed effects regression, the study found a statistically significant positive influence of board size on Tobin's Q ($\beta = 1.83; p = 0.031; R^2 = 0.05$). The results with respect to operating performance measured by return on equity (ROE) ($\beta = -2.58; p = 0.081; R^2 = 0.00$) and return on invested capital (ROIC) ($\beta = -0.119; p = 0.062; R^2 = 0.00$) showed insignificant coefficients suggesting a completely

irrelevant relationship between board size and firm financial performance. The study further reported that board composition has no pronounced effect on operating profit. This indicates that results are sensitive to the model specification used. The study however failed to establish the effect of board size on value-added financial performance since it used accounting-based financial performance measures.

In New Zealand, Dunstan *et al.* (2011) reported findings using 543 firm-years from 125 firms listed at the New Zealand Exchange (NZX). Panel data methodology was used to study the influence covering the years 1998 to 2007. Board composition was measured by the constructs of accounting expertise, gender diversity, board independence and board size while value of the firm is measured by market value of equities per share basis. While board gender diversity, board independence and board size were reported to be 5.6%, 85% and 6.5 respectively, only board gender diversity was found to have a significant effect on firm value ($\beta = 1.983$; $p = 0.013$). Board independence ($\beta = 0.069$; $p = 0.445$) and board size ($\beta = 0.015$; $p = 0.380$) were found to have no significant effect on firm value. The study concluded that firms with a higher percentage of female directors on board are associated with higher market values. The present study differs from the Dunstan *et al.* (2011) study since financial performance is measured by VAIC that is stakeholder-based.

Empirical studies on the effect of board composition on firm financial performance from Asia can be found in the works of Abidin *et al.* (2009), Amran (2011), Al-Musalli and Ismail (2012) and Mahmudi and Nurhayati (2014). While Abidin *et al.* (2009) used 75 randomly selected firms listed at Bursa Malaysia Security Exchange and board composition, directors' ownership, CEO duality and board size as the independent variables, Amran (2011) used 233 family-controlled firms and 191 non-family controlled public listed Malaysian Companies in a panel data study over the period

2003 to 2007. Abidin *et al.* (2009) however used VAIC as a measure of firm performance and reported that VAIC of Malaysian firms is averagely 5.020 as compared to that of UK firms (5.317) and South African firms (4.270). It was further reported that board size and independence have a positive significant effect ($\beta = 0.516$; $p = 0.083$) on firm performance as measured by VAIC. Contrary to Abidin *et al.* (2009), Amran's (2011) study found that board size has a negative significant influence ($\beta = -0.003$; $p = 0.003$) on family-controlled firms' performance but insignificant ($\beta = 0.016$; $p = 0.083$) for non-family controlled firms when performance is measured by Tobin's Q. Both studies however used convenient sampling technique to select the samples that may have introduced bias into the results making them not generalizable. Additionally, the cause-effect of board structure on VAIC for the Abidin *et al.* (2009) study cannot be inferred since the data is cross-sectional. Moreover, Amran's (2011) study cannot be used to infer the influence of board composition on value-added financial performance since the market-based financial performance measure of Tobin's Q is used.

Mahmudi and Nurhayati (2014) reported findings on a study they conducted to establish the influence of board governance characteristics on intellectual capital performance of 31 listed banks in Indonesia. The study employed pooled panel data methodology on data collected from the 31 banks for the years 2008 to 2012. Value-added intellectual capital coefficient was used to measure intellectual capital performance. Descriptive statistics showed mean VAIC and board independence of 2.803 and 49.9% respectively. It was further reported that board independence has a positive effect on firm performance as measured by VAIC ($\beta = 0.1340$; $p = 0.025$). The study recommended that banks enhance the independence of their board if they seek improved intellectual capital performance. The study findings are however not plausible since pooled OLS is used to analyse the data. Moreover, the sample was conveniently picked from banks that operate

in a strict regulatory environment hence limiting the general applicability of the findings to other firms.

In a cross-country study in the Middle East, Al-Musalli and Ismail (2012) investigated the relationship between board of directors' characteristics and intellectual capital performance measured by VAIC for 147 banks in the Gulf Cooperation Council countries for the period 2008 to 2010. Board size and independence were among the board characteristics whose effect was investigated. The average board size and VAIC were found to be 9.0 and 4.04 respectively. Using pooled OLS, the study reported a negative significant relationship between board independence ($\beta = 0.1850$; $p = 0.000$), and a negative insignificant relationship between board size ($\beta = 0.1800$; $p = 0.173$) and VAIC. Although the study recommended that boards reduce the number of independent directors to increase firm value, the findings cannot be generalised to other firms since only banks were sampled.

In Africa, Garba and Abubakar (2014) reported findings of a study on corporate board composition and financial performance measured by ROA, ROE and Tobin's Q for listed insurance companies in Nigeria. The study used data for the period 2004 to 2009 on a sample of 12 conveniently selected listed insurance companies. Feasible Generalised Least Squares (FGLS) and random effects estimators revealed no significant relationship between board size and ROA ($\beta = -0.279$; $p = 0.073$; $R^2 = 0.2618$); ROE ($\beta = -1.843$; $p = 0.191$; $R^2 = 0.22$); and Tobin's Q ($\beta = 0.100$; $p = 0.188$; $R^2 = 0.197$) of insurance companies in Nigeria. However, board gender diversity was found to have a positive significant effect on performance of the firms while board independence was found to have a negative significant effect on firm performance.

Study findings similar to those reported by Garba and Abubakar (2014) can be derived from a study by Adusei (2011) who empirically analysed the relationship between board structure and bank performance with panel data from 17 universal banks in Ghana by using pooled OLS regression, with Return on Equity (ROE) and cost income ratio as measures firm performance. Results showed a negative significant relationship ($\beta = -1.60$; $p = 0.033$; $R^2 = 0.614$) between board size and firm performance implying that as the size of a bank's board decreases, its profitability increases. Findings from the study allude that small boards have positive effect on performance of the firm. It was recommended that banks seeking some improvement in their performance constitute small sized boards of directors composed of few independent directors. Both Garba and Abubakar (2014) and Adusei (2011) however used accounting-based financial measures to measure performance and therefore the future value-creation abilities of the firms could not be effectively gauged.

Studies on the association between board composition and firm financial performance for Kenyan firms have also yielded inconclusive results. Ongore *et al.* (2015) who surveyed 46 companies listed at the NSE in 2011 reported mixed results concerning the effect of the different board composition constructs on firm financial performance. Using multivariate Ordinary Least Squares (OLS) regression analysed on panel data and Return on Assets (ROA), Return on Equity (ROE), and Dividend Yield (DY) as performance indicators, the study revealed a negative significant influence ($\beta = -0.510$; $p = 0.013$) of board size on financial performance of the firm; board independence had a negative insignificant influence ($\beta = -.409$; $p = 0.286$) on financial performance of firms, while board gender diversity had a positive significant effect ($\beta = 0.597$; $p = 0.032$) on firm performance. The study concluded that board composition significantly influences firm performance. This influence was however moderated by firm size. The study

recommended that the role of gender diversity be examined further as it seemingly explains as to why firm differ in financial performance. The cross-sectional data used in the study cannot however effectively and adequately represent the changing structure of the variables over time.

Other studies in Kenya contradict the findings by Ongore *et al.* (2015). For instance, Wachudi and Mboya (2012) found that board gender diversity has a negative insignificant influence ($\beta = -.018$; $p = 0.143$) on firm financial performance measured by ROA using step-wise regression model. The study sampled 32 banks over a 12-year period using a correlational research design and pooled OLS to analyse data. Firm financial performance was measured using ROA. While the study reported that boards of commercial banks in Kenya are male-dominated with a typical board size of eight members having only one female director, it was concluded that the market does not reward or punish firms that have included female directors in their boards.

A research that reports consistent findings to those of Wachudi and Mboya (2012) is that by Leting' *et al.* (2012) who investigated the relationship between board diversity and performance of 40 firms listed at the NSE. The study used age, gender diversity, educational qualifications, study specialization and board specialization as constructs measuring board diversity. Accounting-based financial performance measures of ROA, ROE, DY and P/E ratios were used to measure financial performance. Using a cross-sectional descriptive research design, it was revealed that the oldest and youngest listed firm in the NSE is 114 and 4 years old respectively at the time of the study, with the average age being over 50 years. The study also established that the average board size among the listed firms was nine with the highest and the lowest being 12 and 4 respectively. On the gender diversity perspective, the study reported that about 57.5% of the listed firms had no female board member. Using the OLS regression, results showed no significant association between board diversity ($\beta = -0.056$, $p = 0.079$) and financial performance measured by ROA, DY,

ROE and P/E. By using OLS, the study did not effectively establish the long-run relationship between board diversity and firm performance.

The inconsistent findings concerning the effect of board composition on financial performance of firms listed at the NSE can be confirmed by a study conducted by Chemweno (2016). Unlike the study by Ongore *et al.* (2015) who reported a negative significant influence, and a negative insignificant influence of board size and board independence on financial performance of firms listed at the NSE respectively, Chemweno (2016) found that the two have a negative insignificant and a positive significant influence on financial performance of the listed firms respectively. The study, which used a sample of 42 firms observed over a five-year period from 2010 to 2014, further found that board gender diversity has a positive insignificant effect on firm financial performance measured by ROA. Moreover, the study established that the average board size for the listed firms is nine, with the lowest and highest being three and 15 respectively. Board independence was found to be 59.8% while the mean for board gender diversity is 1.27 with the maximum being five women in the boards and the minimum being zero. The study concluded that board independence should be emphasized and enhanced since it influences financial performance of the firms.

The review of empirical literature indicates that the relationship between board composition and firm performance is inconclusive. Reviewed studies (Adams and Mehran, 2008; Abidin *et al.*, 2009; Belkhir, 2009; Bermig and Frick, 2010; Amran, 2011; Adusei, 2011; Dunstan *et al.*, 2011; Al Musalli and Ismail, 2012; Horvath and Spirollari, 2012; Letting' *et al.*, 2012; Wachudi and Mboya, 2012; Obradovich and Gill, 2013; Garba and Abubakar, 2014; Ongore *et al.*, 2015; Chemweno, 2016) demonstrate inconclusive results that however indicate a possibility of board composition influencing firm financial performance. While Adams and Mehran (2008), Belkhir (2009), Abidin *et al.* (2009) and Bermig and Frick (2010) show that board size has a positive

significant effect on firm financial performance, their studies focused on either conveniently selected samples which introduced bias or cross-sectional data implying that the cause-effect was not effectively established. On the contrary, other studies (Amran, 2011; Adusei, 2011; Obradovich and Gill, 2013; Ongore *et al.*, 2015) established a negative significant relationship between board size and firm financial performance.

On the other hand, with Amran (2011) studying family controlled firms and Adusei (2011) and Ongore *et al.* (2015) using the pooled OLS methodology to analyse data; the long-run effect of board size on value-added financial performance is not established. Elsewhere, Garba and Abubakar (2014) who study insurance firms, Dunstan *et al.* (2011) who use pooled OLS and Chemweno (2016) reported findings that indicate no relationship between board size and financial performance. None of these studies employed value-added financial performance measures. The present study seeks to establish how board size as a component of board composition affects value-added financial performance for an emerging market.

The effect of board independence of financial performance has also received considerable attention empirically with Abidin *et al.* (2009) and Mahmudi and Nurhayati (2014) showing that a larger proportion of non-executive directors in the board could enhance firm performance measured by VAIC. Mahmudi and Nurhayati (2014) sample listed banks in Indonesia and both studies use OLS methodology to analyse data. Researchers who establish a negative relationship between board independence and firm performance include Horvath and Spirollari (2012), Garba and Abubakar (2014), Ongore *et al.* (2015) and Chemweno (2016). These studies were however based on limited samples and used cross-sectional data with Horvath and Spirollari (2012) sampling listed firms in the USA. The long-run effect of board independence across listed firms in an emerging market such as the NSE was not investigated.

There seems to be inconsistent findings in scientific research on the effect of gender diversity in influencing firm financial performance. For instance, while Wachudi and Mboya (2012), Horvath and Spirollari (2012) and Leting *et al.* (2012) reported that the market does not reward or punish firms that have included more female directors in their boards, Dunstan *et al.* (2011) Garba and Abubakar (2014) and Ongore *et al.* (2015) showed that gender diversity significantly explains why firms differ in financial performance. Wachudi and Mboya (2012) studied commercial banks in Kenya indicating that firms from other sectors were not studied. Leting' *et al.* (2012) used OLS to analyse data from 40 listed firms in the NSE. The use of OLS does not allow for the control of unobserved firm effects. Additionally, all these studies used accounting-based financial performance measures that do not measure the future value-creation abilities of the firms.

Generally, the effect of board composition on firm financial performance is inconclusive given the findings of various empirical studies that have been undertaken worldwide. Reviewed literature indicates that board composition through its elements of board size, board independence and board gender diversity may influence firm financial performance. While the effect of board composition on firms' financial performance has been widely studied, extant literature shows diverse relationships. However, most of the studies use conveniently selected firm-specific cross-sectional data that limits the generalization of their results to all listed firms on the NSE. Moreover, most of the studies focus mainly on accounting-based and market-based performance measures that do not reflect the true value of total company's assets due to their exclusion of intellectual capital. None of the studies has incorporated value-based performance measures for all listed firms in emerging economies such as Kenya. Therefore, the effect of board composition on value-added financial performance of firms in the Nairobi Securities Exchange (NSE) has not been established.

2.2.2 Effect of Financial Leverage on Firm Financial Performance

Financial leverage, which is the ratio of the fixed-charge sources of funds to owners' equity in the capital of firm, has received intense attention in both theoretical and empirical studies. The studies have generally shown that financial leverage has intense interrelationships with other financial decisions (Javeed *et al.*, 2014) and can therefore affect a firm's returns as well as influencing its ability to compete (Ramli and Nartea, 2016). Empirical studies however leave an inconclusive view of whether financial leverage influences firm performance.

Extant empirical evidence on the relationship between financial leverage and firm performance of American firms listed in the NYSE can be found in a study Berger and Udell (2006). While proposing a new approach to testing the agency theory of financial leverage using firms in United States banking industry, the study found that there is reverse causality from performance to financial leverage and that data on the United States banking industry are consistent with the agency theory of capital structure. The study used the parametric measure of profit efficiency as an indicator to measure agency costs and econometric techniques to account for reverse causality from performance to capital structure, using annual information for 695 United States commercial banks for the period 1990 – 1995. While the study concluded that higher leverage is significantly associated with better firm performance ($\beta = 1.643$; $p = 0.041$; $R^2 = 0.22$), an earlier but contemporaneous study by Laurent (2002) who studied the relationship between leverage and corporate performance for listed firms in France, Germany and Italy using multiple regression technique reported mixed evidence which is depended on the country. While a negative relationship was reported for Italian firms, the relationship between leverage and corporate performance was found to be significantly positive for France and Germany firms.

In yet another study report from Europe, Tian and Zeitun (2007) investigated the effect of financial leverage on corporate performance of corporations in Jordan using a panel data approach of 167 listed companies for a period of 15 years from 1989 to 2003. The study used ROA, ROE, EBIT and tax plus depreciation to total assets as proxies for accounting performance measurement and Tobin's Q, market value of equity to book value of equity (MBVR), price/earnings (P/E) ratio and market value of equity plus book value of liabilities divided by book value of equity (MBVE) as market performance measures. The results showed that a firm's capital structure has significant negative effect on the firms' performance using both the accounting and market measurements. While these three studies reported inconsistent findings, Berger and Bonaccorsi di Patti (2006) only sampled listed banks with Laurent (2002) and Tian and Zeitun (2007) study all listed firms. Furthermore, Laurent (2002) used cross-sectional data. The findings from these studies cannot therefore be generalised to listed firms in the NSE since they were conducted using carefully-selected samples of firms from the more developed security exchanges unlike for firms listed at the NSE which is still developing.

In a study on the relationship between financial leverage, corporate governance measures and firm value among 155 non-financial firms listed at the Karachi Stock Exchange, Javeed *et al.* (2014) reported that financial leverage has a positive significant effect on firm performance. In their study, financial leverage was measured using total debt to total assets ratio, while firm performance was measured by use of Tobin's Q. The average financial leverage for the firms is found to be 57.9% while Tobin's Q is found to average 0.766. Using the fixed effects regression model, the study finds that high levels of leverage significantly ($\beta = 0.282$; $p = 0.000$; $R^2 = 0.643$) improves market performance of the firms.

In a related study but earlier study in the same country, Akhtar *et al.* (2012) conducted a cross-sectional examination of the relationship between financial leverage and financial performance using 20 listed companies from the Fuel and Energy Sector of Pakistan. By using correlation analysis, their findings showed a positive significant effect ($\beta = 0.132$; $p = 0.002$) between financial leverage and financial performance of the companies thus confirming that the firms seeking higher profitability may improve their financial performance by having high levels of financial leverage. In addition, the study provides evidence that the players of the fuel and energy in Pakistan can improve their financial performance by employing higher financial leverages and can arrive at a sustainable future growth by making vital decisions about the choice of their optimal capital structure. These two studies report similar findings albeit with different sample sizes and industry-specific firms but use of cross-sectional data in both studies did not allow for the control of the unobserved firm effects hence limiting generalization of the findings.

Scientific evidence on the relationship between financial leverage and firms' financial performance among listed firms in Africa can be found in an empirical study by Enekwe *et al.* (2014) who examined the effect of financial leverage on financial performance of pharmaceutical firms over a period of twelve years using a sample of three listed pharmaceutical companies in Nigeria. The study employed debt ratio (DR); debt-equity ratio (DER) and interest coverage ratio (ICR) as measures of financial leverage, while Return on Assets (ROA) was used as the dependent variable. The *ex-post facto* research design was used for this study. Descriptive statistics, Pearson correlation and OLS regressions were used to analyse the data. Results of the analysis showed that debt ratio (DR) ($\beta = -0.032$; $p = 0.781$) and debt-equity ratio (DER) ($\beta = -0.011$; $p = 0.209$) have negative insignificant relationship with Return on Assets (ROA) while interest coverage ratio ($\beta = 0.01$; $p = 0.472$) has a positive insignificant relationship with Return on Assets (ROA). The

analysis therefore revealed that all the independent variables had no significant effect on financial performance of the three companies. It was recommended that the amount of debt finance in the financial mix of the firm should be at the optimal level to ensure adequate utilisation of the firms' assets. Since the study employed a small sample that was limited to the pharmaceutical industry, the results may not be robust.

Prior empirical studies on the relationship between financial leverage and firms' financial performance carried out on the NSE similarly show a diversity of results. Maina and Ishmail (2014) reported findings on a census study of all firms listed at the NSE from year 2002 to 2011 using a causal research design and panel data methodology that involved pooling of observations on a cross-section of units over several periods. ROA, ROE and Tobin's Q were used to measure firm performance while debt equity ratio was used to measure financial leverage. Descriptive statistics showed mean value for ROE is 16.51% while ROA is 51.80% indicating a relatively good performance of the listed firms. However, the standard deviation of 0.622 with respect to ROA reported suggested that while a few firms are doing well, most of them were not. Tobin's Q reported showed a high percentage of 1828.11% attributed to increase in firms share price and equity without increase in real activities of performance for the firms. The capital structure ratios showed listed firms have an average of 31.85% financial leverage. The study further found evidence of a negative and significant relationship between financial leverage and all measures of performance that were used of ROE, ROA and Tobin's Q. This implies that firms that used more debt as a source of finance experienced low performance. The study concluded that firms listed at NSE used more short-term debts than long term and recommended that firms should take into cognizance the amount of leverage incurred because it is a major determinant of firms performance. By using ROE, ROA and Tobin's Q to measure firm performance, the study failed

to inform on the relationship between financial leverage and the value-addition performance of the firms' assets.

Mule and Mukras (2015) also presented findings of a study on the relationship between financial leverage and financial performance of 47 listed firms in Kenya using annual data for the period 2007 to 2011. The study used ROA, Tobin's Q and ROE as measures of firm performance. Using various panel procedures, the study found that the relationship between financial leverage and financial performance depends on the measure of performance used. For instance, there was a reasonably strong evidence that financial leverage significantly, and negatively, affects the performance of listed firms in Kenya when performance is measured in terms of ROA ($\beta = -0.0438$; $p = 0.0350$) and Tobin's Q ($\beta = -0.5144$; $p = 0.0124$). However, financial leverage was found to have a negative and insignificant effect on performance measured by ROE ($\beta = -0.0176$; $p = 0.5765$). Although the study concluded that that financial leverage is an important negative predictor of financial performance measured in terms of ROA and Tobin's Q, these financial measures are either accounting-based or market based and hence they don't represent the true value of the company's total assets since.

The review of literature on the relationship between financial leverage and firm performance reveals plausible but unsystematic relationship between the variables. The studies (Laurent, 2002; Berger and Bonaccorsi di Patti, 2006; Tian and Zeitun, 2007; Akhtar *et al.*, 2012; Javeed *et al.*, 2014; Maina and Ishmail, 2014; Enekwe *et al.*, 2014; and Mule and Mukras, 2015) provide insights into the relationship between financial leverage and firm performance. Berger and Bonaccorsi di Patti (2006) show a positive significant relationship between financial leverage and firm performance for listed US firms possibly due to the developed financial markets. The study however samples listed commercial banks only. Laurent (2002) using cross-sectional data reports

inconsistent relationships for selected listed firms in France, Germany and Italy. The use of cross-sectional data indicates spurious interpretation of results and the relationship between financial leverage and value-based is not established. Tian and Zeitun (2007) reported a negative significant effect of financial leverage on corporate performance of firms in Jordan. The study uses ROA, ROE, EBIT and Tobin's Q as measures of firm performance. Javeed *et al.* (2014) and Akhtar *et al.* (2012) showed a positive significant effect of financial leverage on firm value using conveniently-selected samples indicating that the results were cautiously interpreted. Enekwe *et al.* (2014) equally conveniently study a small sample of three Nigeria listed pharmaceutical companies. Maina and Ishmail (2014) and Mule and Mukras (2015) similarly reported inconsistent relationships between financial leverage and firm performance measured by ROA, ROE and Tobin's Q for listed firms on the NSE. Moreover, all the studies used either accounting-based or market-based financial performance measures which do not show future value creation abilities of the firms.

Empirical literature on the relationship between financial leverage and firm performance shows a diversity of results. All the reviewed studies focus on either accounting-based or market-based financial performance measures which are becoming less useful due to their exclusion of intellectual capital. While studies conducted in Kenya have attempted to link financial leverage and firm performance, the effect of financial leverage on value-added financial performance has not been analysed for firms listed at the NSE.

2.2.3 Role of Board Composition and Financial Leverage on Firm Financial Performance

There is empirical evidence that firm performance depends on corporate governance practices and financial leverage decisions. Okiro *et al.* (2015) conducted a study to establish the effect of corporate governance and capital structure on performance of firms listed at the East African

community securities exchange in Kenya, Tanzania, Uganda, Rwanda and Burundi. The study sought to establish whether good corporate governance affects firms' performance by integrating capital structure into the governance model. Corporate governance was measured by board structure, ownership and shareholding, transparency and disclosures, board remuneration and corporate ethics while return on assets (ROA) was used to measure firm performance. A census survey was carried out on all the 98 listed companies between 2009 and 2013 in Nairobi Securities Exchange, Uganda Securities Exchange, Dar-es-Salaam Stock Exchange and Rwanda Stock Exchange. Descriptive statistics show that financial leverage was averagely 0.2943 with a minimum of 0.001, a maximum of 1.6845. Comparatively, ROA has a mean of 0.2051. Corporate governance index has a mean of 0.7268. Analysis of skewness shows that most of the firms are doing well when the above measures are considered. The findings revealed that there is a significant positive relationship between corporate governance and firm performance ($\beta = 1.249$, $p = 0.000$); and between corporate governance and financial leverage ($\beta = 0.623$, $p = 0.000$). Using the Baron and Kenny (1986) approach, it was found that there is a significant intervening effect of financial leverage on the relationship between corporate governance and firm performance as measured by ROA. The use of return on assets (ROA) to measure firm performance did not however reveal the value-creation abilities of the firms implying that the role of corporate governance and financial leverage in influencing the value-creation abilities of the firms was not revealed. Additionally, the study does not reveal the influence of the specific corporate governance practices in influencing firm performance implying that the specific role of board composition elements and financial leverage in influencing firm performance was not analysed.

Ramli and Nartea (2016) on the other hand investigate the role of financial leverage and firms' macro-economic attributes such as bond market development, stock market development,

economic growth, interest rate, and inflation rate on financial performance measured by ROA and ROE. The study used listed firms in the Bursa Malaysia for the period from 1990 to 2010. Using the PLS-SEM model, the study reveals that factors of capital structure choice that may be mediated by financial leverage are asset structure, growth opportunities, liquidity, non-debt tax shield and interest rate. The study is however limited to macro-economic factors and does not therefore reveal how financial leverage mediates board composition elements.

The review of literature on the mediating role of financial leverage indicates that scanty research has been carried on this variable. The reviewed studies indicate that while Okiro *et al.* (2015) conducted a study on the mediating role of financial leverage among firms listed at the East African community securities exchange in Kenya, Tanzania, Uganda, Rwanda and Burundi, the study focuses on the relationship between corporate governance and capital structure in general. Furthermore, firm performance is measured by accounting-based measures. This implies that little is known on the combined role of board composition and financial leverage in influencing value-added financial performance.

The foregoing survey of empirical literature highlights the importance of board composition on the efficient operations of firms. The review has further demonstrated that financial leverage decisions are important in enhancing firm performance. The review has shown that no known study explores the relationship between board composition and value-added financial performance for all firms listed at the NSE. Evidence on the role of board composition in influencing financial leverage for listed firms in NSE is also minimal. The review has demonstrated that little is known concerning the interaction between financial leverage and value-added financial performance among listed firms in the NSE. It is therefore apparent that the mediating effect of financial leverage

on the relationship between board composition and financial performance as theorized by the Resource Dependency Theory has not been examined for firms in the NSE.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter presents the methodology that was adopted in the study including the research design, study area, data sources and collection methods, methods of data processing, analysis and presentation.

3.1 Research Design

Gujarati (2007) defines a research design as a comprehensive master plan of the research study to be undertaken, giving a general statement of the methods to be used to ensure that requisite data in accordance with the problem at hand is collected accurately and economically. According to Kerlinger (1986), there are three basic paradigms to research, quantitative approach, qualitative approach and the mixed method. The quantitative approach involves the generation of data in quantitative form that can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This approach can be further sub-classified into inferential, experimental and simulation approaches to research.

The purpose of inferential approach to research is to form a data base from which to infer characteristics or relationships of population. This usually means survey research where a sample of population is studied to determine its characteristics, and it is then inferred that the population has the same characteristics. While the experimental approach is characterized by much greater control over the research environment and in this case some variables are manipulated to observe their effect on other variables, the simulation approach involves the construction of an artificial environment within which relevant information and data can be generated(Kerlinger, 1986). The latter approach permits an observation of the dynamic behaviour of a system (or its sub-system) under controlled conditions.

The qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour. Research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form that is not subjected to rigorous quantitative analysis. Generally, the techniques of focus group interviews, projective techniques and in-depth interviews are used. Mixed method is a combination of both quantitative and qualitative approaches (Creswell, 2014).

Generally, the quantitative paradigm is termed the traditional and positivist, while the qualitative research is considered constructivist and experiential. The present research adopts the quantitative paradigm, and since the cause and effect relationship between quantitative variables is sought, a correlational research design is adapted. According to Sekaran (2000), a correlational research design is applicable in studies where important quantitative variables associated with the problems are to be delineated. Furthermore, a correlational study is conducted in the natural environment of the organization with minimal interference of the researcher.

3.2 Study Area

The study was carried out in the Nairobi Securities Exchange (NSE) located in Nairobi City in Kenya on latitude 1^o17' south, and longitude 36^o49' east. Nairobi City that doubles as the county and country headquarters of Nairobi County and Kenya respectively, lies at an altitude of about 1700 metres above sea level. With a population of approximately 3.06 million in 2009 (Kenya National Bureau of Statistics, 2010), and covering an area of 684 square kilometres (Mule and Mukras, 2015), Nairobi is the second-largest city by population in the African Great Lakes region after Dar es Salam, Tanzania. The City is the home to thousands of Kenyan businesses and over 100 major international companies and organisations, including the United Nations Environmental Programme (UNEP) and the United Nations Office at Nairobi (UNON).

Nairobi is an established hub for business and is thus the home of the Nairobi Securities Exchange (NSE), one of the largest and second-oldest Exchanges in Africa. It is Africa's fourth-largest exchange in terms of trading volume, capable of making 10 million trades a day (NSE, 2014). The Exchange was established in 1953 by the then colonial governments to facilitate security exchanges in the East African region comprising Kenya, Tanganyika (and Zanzibar), and Uganda. After independence, the Exchange became Kenya's national Exchange, the Nairobi Stock Exchange which has since been renamed the Nairobi Securities Exchange. The Exchange has undergone several transformations since independence including growth in market capitalisation, increase in number of listed firms to 64 in 2014, automation of trading and institutionalization of corporate governance principles (NSE, 2015). Despite these developments, listed firms in the Exchange still differ from those in developed exchanges in areas such as corporate governance practices, financial leverage levels, firm sizes, firm ages, financial performance and asset tangibility levels making it a special study area. The study area map is appended in Appendix V.

3.3 Target Population

The target population of the study comprised all the 64 firms listed at the Nairobi Securities Exchange (NSE) as at December 2014 (Appendix II). These firms are classified into eleven sectors, namely; agricultural, automobiles and accessories, banking, commercial and services, construction and allied, energy and petroleum, insurance, investment, manufacturing and allied, telecommunication and technology and growth and enterprise market segment (NSE, 2014).

Public listed companies were selected due to the central role they play in the economy of Kenya and are therefore a representative sample of firms in Kenya. It has been shown that listed firms averagely contributed 17.6% of revenue to the Gross Domestic Product (GDP) of Kenya during the years 2003 to 2017 (NSE, 2018). Additionally, the listed firms were selected since their board

compositions, financial leverages and financial performance are clearly determined as opposed to smaller unlisted firms.

3.4 Sampling Design

Purposive sampling technique was used to select a sample of 42 listed firms that had consistently been listed in the NSE for the period January 2003 to December 2014. According to Sekaran (2000), purposive sampling is a non-probabilistic sampling design in which the researcher consciously selects participants to be included in a study because they have particular characteristics that are of interest to the researcher. The method was considered suitable since it allowed a longer longitudinal and broader cross-sectional market-wide study using balanced panel data. Cavana *et al.* (2000) opines that balanced panel data is a more sensitive measurement of changes that could occur between two points in time and the results produced are more robust, consistent and stable to generalize about the population.

3.5 Data Collection

3.5.1. Sources of Data

The research used secondary data that was obtained from annual financial reports of the listed firms from January 2003 to December 2014. The data collected was on board composition elements of board size, independence and gender-diversity, financial leverage levels and on value-added financial performance. Data on the control variables of firm size, firm age and asset tangibility was also collected. The data was collected from audited published annual financial statements available in the NSE Handbooks sourced from the CMA library. Secondary data from annual financial reports was used because, being statutory documents, the reports facilitate easy comparisons since they are produced on an annual basis by all companies (Branco *et al.* 2011).

Furthermore, since they are audited annually, data reliability and validity is enhanced making them more credible sources of data.

3.5.2 Instruments of Data Collection

Document review method was used to collect the secondary data on the study variables. The data collected was based on the constructs required as per the data collection sheet (Appendix III).

3.5.3 Data Collection Procedure

After obtaining authorization to the field by the University, the researcher obtained a letter of authority to conduct research from the National Commission for Science, Technology and Innovation (NACOSTI) (Appendix I). Two research assistants were trained on how to extract the data from the financial statements and record it in the data collection sheets. Permission was then sought at the Capital Markets Authority Library from where the data was obtained from the NSE Handbooks. The raw data was then standardised by using financial ratio analysis techniques with the help of a pre-programmed Microsoft Excel spreadsheet.

3.5.4 Data Validity

Validity refers to the degree to which an assessment tool measures what it is intended to measure and the extent to which it provides information that will answer specific important questions (Sekaran, 2000). Robson (2011) defines validity as the extent to which a construct correctly represents the concept of study, and the degree to which it is free from any systematic error. Validity can be evaluated using four elements; face, criterion, content and construct (De Vaus, 2002). Face validity measures the extent to which a test is subjectively viewed to be covering the concept it purports to measure, while criterion validity is the extent to which a test or a tool compares with an already existing tool. Content validity refers to the extent to which the instrument's items represent the content of the given construct (Sekaran, 2000). As observed by

De Vaus (2002), construct validity is the degree to which the items on an instrument relates to the relevant theoretical constructs. The research items in the present study were evaluated in terms of face, criterion, content and construct validity by using expert opinions of four professional financial analysts. The experts opined that the items adequately and sufficiently represented the content for each construct.

3.5.5 Data Reliability

Creswell and Plano (2007) assert that reliability gives the internal consistency of data collected that ensures that the data has certain internal consistent pattern. Checking for reliability therefore ensures that the degree of consistency or stability is high even when the test is repeated. In line with previous studies (Maina and Ishmael, 2014; Mule and Mukras, 2015), this study uses secondary data from published financial statements. The use of the statements which are prepared according to Generally Accepted Accounting Principles (GAAPs) and which are further audited before publication ensured preliminary reliability of the data.

According to Field (2000), another important assumption that must be considered before secondary panel data is considered reliable is the data's stationarity. Empirical work based on time series data assumes that the underlying time series is stationary, that is, its mean, variance and auto covariance (at various lags) remain the same no matter at what point they are measured. Such a series will tend to return to its mean and fluctuations around this mean will have a broadly constant amplitude. Gujarati (2007) asserts that stationarity tests are conducted to avoid change of estimates over time in the study variables which would in turn lead to spurious estimates. Testing for stationarity of the individual time series is important because if a time series is non-stationary, we can study its behaviour only for the time period under consideration and as a consequence, it is not possible to

generalize it to other time periods. Moreover, regression of a nonstationary time series on another nonstationary time series may produce spurious regression.

To establish the stationarity conditions of the data series in this study, unit root test using the Augmented Dickey-Fuller (ADF) methodology was conducted, with the null hypothesis being that the series under consideration is non-stationary or has a unit root. The absolute value of the ADF test statistic was compared with the absolute value of the critical value and where the absolute value of the ADF test statistic is more than the absolute value of the critical value, we reject the null hypothesis and conclude that the time series is stationary (Gujarati, 2007). A summary of the results for the ADF test for the series is presented in Table 3.1. Where a time series was found to be nonstationary, it was differenced until it became stationary.

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

| Series | ADF Statistic (Critical Value = -2.8680; $p = 0.05$) | Prob (1%) | At levels | At first Difference |
|---------------|--|----------------------|------------------|----------------------------|
| BGDIV | -5.9253 | 0.0000 | <i>I</i> (1) | <i>I</i> (0) |
| BIND | -4.1585 | 0.0000 | <i>I</i> (0) | - |
| BSIZ | -2.0239 | 0.0000 | <i>I</i> (0) | - |
| FAGE | -1.8387 | 0.0003 | <i>I</i> (1) | <i>I</i> (0) |
| FLG | -1.7240 | 0.0008 | <i>I</i> (1) | <i>I</i> (0) |
| FSIZ | -1.0980 | 0.0001 | <i>I</i> (1) | <i>I</i> (0) |
| TANG | -2.8893 | 0.0013 | <i>I</i> (0) | - |
| VAIC | -6.5766 | 0.0000 | <i>I</i> (1) | <i>I</i> (0) |

Source: Field Data, 2017

As depicted in Table 3.1, apart from board independence, board size and asset tangibility, all the data series were found to nonstationary and were therefore differenced for them to be suitable for data analysis and interpretation.

3.6 Data Analysis and Presentation

Panel data estimation methods were employed in this study because the observations have two dimensions; cross-section and time-series. As asserted by Hsiao (2005), panel data estimation methodology contains more degrees of freedom and less multicollinearity leading to estimates that are more efficient. Moreover, it allows for greater flexibility in modelling differences in behaviour across entities that enables the control for unobserved heterogeneity (Wooldridge, 2002).

The panel data analysis method has three approaches; pooled model, the fixed effects model and the random effects model. As observed by Hilmer and Hilmer (2014), in the pooled model, the data from the different time periods is lumped into one large cross-section and estimations made using the Ordinary Least Squares (OLS) methodology. However, OLS methodology does not yield the best estimators because it fails to exploit the significant advantages offered by the panel nature of the data (Hilmer and Hilmer, 2014) and therefore, for more plausible results, a choice between the fixed effects and the random effects models is made.

The difference between the fixed effects and random effects approaches is the assumption made about the likely correlation between the individual or cross-section specific error component and the regressors. The fixed effects model allows for heterogeneity among the firms by allowing each firm to have its own intercept value. To make the choice, the Hausman test was conducted with the null hypothesis being that the errors are not correlated with the regressors (Hsiao, 2005). Where the null hypothesis is supported, the random effects model is adapted otherwise, the fixed effects model is adapted. Results for the Hausman test are presented in Table 3.2.

Table 3.2: Testing for Model Selection using Hausman Test

| Test Summary | Chi-Sq. Stat | Chi-Sq. d.f. | Prob |
|----------------------|---------------------|---------------------|-------------|
| Cross-Section | 0.376231 | 2 | 0.0037 |

Source: Field Data, 2017

Results from the Hausman test presented in Table 3.2 indicate that the null hypothesis of random effects model is rejected. The study therefore adopted the fixed effects model.

Hierarchical panel data correlation and regression analyses with the aid of a computer software Econometric Views (EViews) were used to analyse data.

3.7 Model Specification

To conform to previous mediational studies, the study adopts the model used by Ramli and Nartea (2016) with some modifications. The macro-economic factors that formed the independent variable in the Ramli and Nartea (2016) study are replaced in this study with board composition elements, while firm financial performance which was measured by growth opportunities and liquidity is replaced with VAIC. The following panel data regression models are mathematically tested. For each model and where applicable;

FLG_{it}: Firm financial leverage for firm *i* during time *t*;

BSZ_{it}: Board Size of firm *i* during time *t*;

BIND_{it}: Board Independence for firm *i* during time *t*;

BGDIV_{it}: Board Gender Diversity for firm *i* during time *t*;

FSIZ_{it}: Firm Size of firm *i* during time *t*;

FAGE_{it}: Firm Age of firm *i* during time *t*;

TANG_{it}: Asset tangibility of firm *i* during time *t*;

$VAIC_{it}$; Value-added intellectual capital coefficient (VAIC) for firm i in time t .

ε_{it} : The idiosyncratic disturbance term for firm i during time t assumed to have a mean of zero and constant variance.

Model 3.1 is the fixed effects panel data regression model of the effect of board composition on value-added financial performance of firms in the NSE.

Model 3.1: Effect of Board Composition on Value-added Financial Performance of firms in the NSE

$$VAIC_{it} = \beta_{01} + \beta_{11}BSZ_{it} + \beta_{12}BIND_{it} + \beta_{13}BGDIV_{it} + \beta_{14}FSIZ_{it} + \beta_{15}FAGE_{it} + \beta_{16}TANG_{it} + \mu_i + \varepsilon_{it}$$

..... (3.1)

Where;

β_{01} : The intercept,

β_{kj} : The regression coefficients with k representing the model and j representing the coefficient, and;

μ_i : The unobservable individual heterogeneity.

Model 3.2 is the fixed effects panel data regression model for the effect of financial leverage on value-added financial performance of firms listed at the NSE.

Model 3.2: Effect of Financial Leverage on Value-added financial performance of firms Listed at NSE

$$VAIC_{it} = \beta_{02} + \beta_{21}FLV_{it} + \beta_{22}FSIZ_{it} + \beta_{23}FAGE_{it} + \beta_{24}TANG_{it} + \mu_i + \varepsilon_{it}; \dots\dots\dots (3.2)$$

Where;

β_{02} : The intercept,

β_{kj} : The regression coefficients with k representing the model and j representing the coefficient, and;

μ_i : The unobservable individual heterogeneity.

To examine the mediating effect of financial leverage on the relationship between board composition and value-added financial performance, hierarchical panel data regression methodology was employed. As observed by Field (2000), in a hierarchical regression, predictors are selected based on past work and the experimenter decides in which order to enter the predictors in the model in order to meet objectives of the study. As a general rule, known predictors should be entered into the model first in order of their importance in predicting the outcome and thereafter, new predictors can be entered into the model in a stepwise manner. To this effect, steps proposed by Baron and Kenny (1986) were followed.

According to Baron and Kenny (1986), testing for mediation can be done in three steps; first, regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable, and; third, regressing the dependent variable on both the independent variable and the mediator. Accordingly, the independent variable in the first two models is expected to show statistical significance, while the third model is expected to show statistical significance of the mediator variable and the insignificance of the independent variable. The effect of the independent variable on the dependent variable must therefore be less in the third equation than in the second. Therefore, to test mediation, the following three models were employed:

Model 3.3, 3.4 and 3.5: Effect of Financial Leverage on the Relationship between Board Composition and Value-added financial performance

$$FL_{it} = \beta_{03} + \beta_{31}BSZ_{it} + \beta_{32}BIND_{it} + \beta_{33}BGDIV_{it} + \beta_{34}FSIZ_{it} + \beta_{35}FAGE_{it} + \beta_{36}TANG_{it} + \mu_i + \varepsilon_{it};$$

..... (3.3)

$$VAIC_{it} = \beta_{04} + \beta_{41}BSZ_{it} + \beta_{42}BIND_{it} + \beta_{43}BGDIV_{it} + \beta_{44}FSIZ_{it} + \beta_{45}FAGE_{it} + \beta_{46}TANG_{it} + \mu_i + \varepsilon_{it};$$

..... (3.4)

$$VAIC_{it} = \beta_{05} + \beta_{51}BSZ_{it} (FLV)^{-1}_{it} + \beta_{52}BIND_{it} (FLV)^{-1}_{it} + \beta_{53}BGDIV_{it} (FLV)^{-1}_{it} + \beta_{54}FSIZ_{it} + \beta_{55}FLAG_{it} + \beta_{56}TANG_{it} + \mu_i + \varepsilon_{it};$$

..... (3.5)

Where: β_{03} , β_{04} , and β_{05} : The intercept for model 3, 4 and 5 respectively;

β_{kj} : The regression coefficients with k representing the model and j representing the coefficient, and;

μ_i : The unobservable individual heterogeneity.

$(FLV)^{-1}_{it}$: The mediating effect of financial leverage on board composition elements for firm i during time t .

Three outcomes were expected from the output; complete mediation (where the independent variable has no effect on the dependent variable when the mediator is controlled), partial mediation (when the independent variable has a reduced effect on the dependent variable when the mediator is controlled), or no mediation (when the independent variable has no significant relationship with the mediator variable). The independent variable in the first two models was expected to show statistical significance, while the third model was expected to show statistical significance of the mediator variable and the insignificance of the independent variable. The effect of the independent variable on the dependent variable was therefore expected to be less in the third equation than in the second.

The Judd and Kenny (1981) Difference of Coefficients approach and the conservative Sobel-Goodman tests were used to obtain and test for significance of the indirect effect respectively. As observed by (Wahba and Elsayed, 2015), the Sobel-Goodman test is a specialized t test that

provides a method to determine whether the reduction in the effect of the independent variable after including the mediator in the model, is a significant reduction and therefore ascertain whether the mediation effect is statistically significant.

3.8 Testing Assumptions for Linear Regression Analysis

Before regressing data for analysis purposes, the data was checked to avoid violation of the assumptions of classical linear regression model as asserted by Hair *et al.* (2010). This was to ensure that the data yields best least squares unbiased estimators (BLUE). According to Field (2000), the common tests that should be conducted are; types of variables, normality, homoscedasticity, multicollinearity and serial correlation. The results for these tests are explained in the sub-sections below.

3.8.1 Types of Variables

Field (2000) observes that for reasonable empirical conclusions from sample data, the independent variables must be either quantitative or categorical and the dependent variable must be continuous, quantitative or unbound. This condition is fulfilled for the present study since elements of board composition, financial leverage and value-added financial performance measures are all quantitative. Similarly, control variables are all quantitative. This means that the type of variables do not violate the requirements of regression analysis in this regard. The measurement of these variables is explained in the sub-sections below. Gietzmann and Ireland (2005) observe that the choice of measurement method to use depends on the application and data availability.

3.8.1.1 Measurement of Board Composition

In the present study, board composition refers to the various mechanisms employed by firms to harness the knowledge, skills, experience and resources in the directors required to achieve a firm's

objectives. Board composition was measured by its elements of board size, board independence and board gender diversity. To remain consistent with previous studies (Abidin, 2009; Abeysekera, 2010; Bermig and Frick, 2010), board size (*BSZ*) was measured as the number of board members attending board meetings in a certain year, both executive and non-executive, while board independence (*BIND*) was measured by the proportion of non-executive directors in the board of directors (Abeysekera, 2010; Al-Musalli and Ismail, 2012). On the other hand, board gender diversity (*BGDIV*) was measured by the proportion of female directors in the board of directors during the financial year (Horvath and Spirollari, 2012; Chemweno, 2016).

3.8.1.2 Measurement of Financial Leverage

According to Pandey (2010), several measures of financial leverage (*FLG*) have been proposed. These include Debt Ratio (total liabilities to total assets), Debt-Equity Ratio (total liabilities to total equity) and Equity Ratio (total equity to total assets). This study used the Debt Ratio as a measure of financial leverage. According to Kajanathan (2012), the Debt Ratio is the ratio widely used to measure financial leverage since it is easily understandable. Pandey (2010) asserts that the DR captures the true value of the indebtedness of a firm by comparing the value of total assets financed by total liabilities and, unlike other measures, it is more specific since its value ranges between zero to one.

3.8.1.3 Measurement of Value-added Financial Performance

Value-Added Intellectual Capital Coefficient (VAIC) was used to measure value-added financial performance (*VAP*). Although several measures of value added by the firm that have been developed, Shill (2009) notes that the VAIC model has been widely accepted empirically and in practice since it measures value creation abilities of firms from the stakeholder's point-of-view.

Moreover, the instrument has been used in a number of past studies (Ho and Wong, 2001; Shill, 2009; Abidin *et al.*, 2009; Al-Musalli and Ismail, 2012; Mahmudi and Nurhayati, 2014).

3.8.1.4 Measurement Firm Size

Firm size (*FSZ*) was used as control variable in this study since is a relevant variable that could confound the relationship between board composition and value-added financial performance (Ho and Wong, 2001). Moreover, Wahba and Elsayed (2015) indicate that large firms are likely to have more resources that could enhance a firm's ability to determine its board composition elements. Firm size has been related to existence of economies of scale inherent in investments and therefore could influence firm financial performance. Additionally, the size of a firm is related to the risks and costs of bankruptcy. According to Ayot (2011), larger firms are more diversified and are therefore prone to lesser risk of bankruptcy leading to better financial performance. While different measures of firm size have been proposed, the present study used ratio of sales to total assets to measure firm size because it is simple and easily understandable (Ayot, 2011).

3.8.1.5 Measurement of Firm Age

Firm age (*FAGE*) was also used as a control variable since board composition elements are rooted in time (Elsayed and Wahba, 2013). Further, controlling for firm age is important because older firms have financial leverage decisions at the centre stage which may influence firm performance. Firm age can be measured in two ways; number of years since incorporation, or number of years since listing in the securities exchange. In tandem with previous studies (Leting' *et al.*, 2012; Chemweno, 2016), firm age was measured by the number of years since incorporation.

3.8.1.6 Measurement of Asset Tangibility

Asset tangibility (*TANG*) has also been shown to influence both financial leverage and firm performance (Hasan and Butt, 2009). To conform to previous studies that have studied asset tangibility (Haris and Raviv, 1991; Ayot, 2011; Mule and Mukras, 2015), asset tangibility was measured by the ratio of non-current assets to total assets.

3.8.2 Testing for Normality of Residuals

The assumption of normality of residuals signifies the generalizability of findings (Gujarati, 2007). In this study, normality was diagnosed using a histogram of regression-standardised residuals along with their summary statistics for value-added financial performance of the listed firms. The histogram of residuals is a simple graphical device that is used to learn something about the shape of the probability density function (PDF) of a random variable.

Specifically, skewness and kurtosis tests and the Jarque-Bera (JB) test of normality were analysed. Skewness measures the degree of asymmetry of the distribution while kurtosis measures the relative peakedness or flatness of the distribution relative to the normal distribution. According to Tabachnick and Fidell (2007), data is considered normal if the skewness value for its residuals is zero or close to zero, and kurtosis value for the residuals is 3.0 or close to 3.0. The rule of thumb is that in a normally distributed sample, the JB statistic is zero, and if the residuals are not normally distributed, the statistic will assume increasingly larger values. The null hypothesis for the JB is that the residuals are normally distributed (Gujarati, 2007). The results of normality are presented in Fig 3.1.

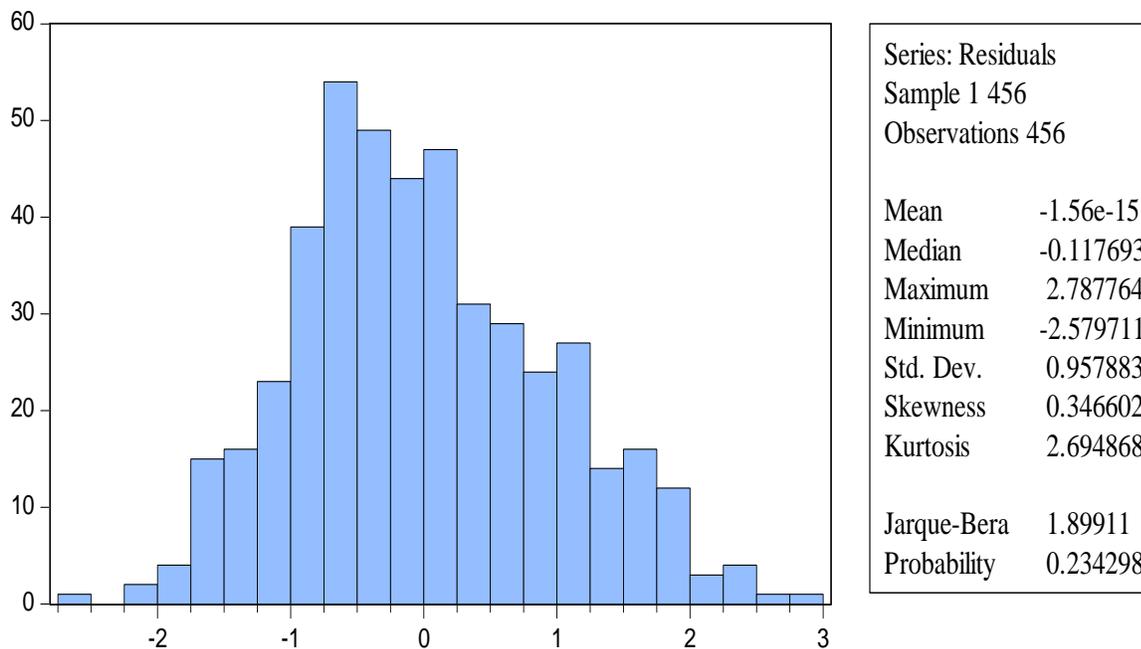


Figure 3.1: Histogram of Regression Standardised Residuals for Performance

Source: Field Data, 2017

Overall, the histogram of regression standardised coefficients for value-added financial performance and the JB statistic in Fig 3.1 indicate that there is no reason to reject the null hypothesis that the error terms are not normally distributed. Additionally, the values for skewness and kurtosis lie within the limits suggested by Tabachnick and Fidell (2007) of close to 1.0 and 3.0 respectively. The assumption for normality of data is therefore met.

3.8.3 Testing for Homoscedasticity

The homoscedasticity condition is fulfilled when at each level of the predictor variables, the variance of the residuals terms are constant. Whenever the assumption does not hold, and the data is heteroscedastic, the regression analysis will yield biased standard errors, spurious results and incorrect conclusions about significance of the regression coefficients (Field, 2000). This condition was not tested in the present study since it is not considered a serious problem for panel data (Gujarati, 2007; Ayot, 2011). Mule and Mukras (2015) assert that the use of panel data allows

identification and measurement of effects that are not detectable in pure cross-sectional or pure time-series data. Panel data therefore, allowed the researcher to account for heteroscedasticity that may have arisen due to the variations in several dimensions for the listed firms under study.

3.8.4 Testing for Multicollinearity

According to Hair *et al.* (2010), multicollinearity refers to a situation where two or more explanatory variables are highly linearly related. Testing for multicollinearity is necessary before data analysis because highly collinear explanatory variables result to estimators that are not best linear unbiased estimators (BLUE). This is because as multicollinearity increases, the standard error of coefficients increases making them less reliable. Multicollinearity was tested in the present study by means of tolerance and variance inflation factor (VIF). Pallant (2007) observes multicollinearity among explanatory variables is present if VIF and tolerance values of above 10 and below 0.1 respectively are observed. Table 3.3 presents results of the VIF test for the independent variables.

Table 3.3: Testing for Multicollinearity using VIF

| Variable | Tolerance | VIF |
|-----------------|------------------|------------|
| BGDIV | 0.437 | 2.288 |
| BIND | 0.624 | 1.602 |
| BSIZ | 0.609 | 1.641 |
| TANG | 0.523 | 1.912 |
| FAGE | 0.287 | 3.485 |
| FLG | 0.296 | 3.378 |
| FSIZ | 0.501 | 1.996 |

Source: Field Data, 2017

As observed in Table 3.3, all the VIF values lie below 10 whereas the tolerance values are all more than 0.1, indicating that there are no issues of multicollinearity among the explanatory variables.

3.8.5 Testing for Autocorrelation

Autocorrelation refers to lack of independence between the residual terms of observations (Field, 2000). For data to have high predictive power, the residual terms between any two observations in different periods should not be autocorrelated (Maddala, 2001). The Breusch-Godfrey Serial Correlation Lagrange Multiplier (LM) test was used to test autocorrelation. The null hypothesis for the test is that there is no serial correlation while the alternative hypothesis is that there is serial correlation. Table 3.4 shows the initial result of the test.

Table 3.4: Breusch-Godfrey Serial Correlation LM Test of Residual Terms

| | | | |
|----------------------|---------|-------------------------|--------|
| F-statistic | 0.43592 | Prob. F(2,448) | 0.7900 |
| Obs*R-squared | 0.98721 | Prob. Chi-Square | 0.7868 |

Source: Field Data, 2017

Based on the probability value of the observed R-squared value in the Breusch-Godfrey LM test results presented in Table 3.4, we fail to reject the null hypothesis and conclude that the residuals have no serial correlation.

CHAPTER FOUR: RESULTS AND DISCUSSION

In this chapter, results and discussion for each objective are presented. The descriptive statistics on the study variables are presented first before their effects are investigated. Subsequently, the effect of board composition on firm value-added financial performance, and that of financial leverage on firm value-added financial performance are presented along with the discussions. Finally, results and discussion on the mediating effect of financial leverage on the relationship between board composition and value-added financial performance of firms are presented.

4.1 Descriptive Statistics of Study Variables

The initial targeted sample out of a population of 64 listed firms for this study was the 42 firms that had continuously been listed in the NSE for the twelve-year period of January 2003 to December 2014. Out of the 42 firms, complete data was collected from 38 firms. This represents an overall data collection rate of 90%. The remaining 10% represented firms whose data was either completely missing or partially missing, and were therefore dropped from the sample. The 38 firms represented 59% of the listed firms. Rogelberg and Stanton (2007) assert that for studies carried out at the organizational level, the acceptable data collection rate should be over 35%. Therefore, the data collection in the present study met this criterion and hence was suitable in ensuring accuracy and minimization of bias.

Table 4.1 shows the descriptive statistics of the study variables of board composition elements, financial leverage and Value-Added Intellectual Capital (VAIC).

| Statistic | BGDIV | BIND | BSIZ | FLG | FAGE | FSIZ | TANG | CEE | HCE | SCE | VAIC |
|---------------------|--------------|-------------|-------------|------------|-------------|-------------|-------------|------------|------------|------------|-------------|
| Mean | 0.129 | 0.774 | 9.030 | 0.602 | 60.136 | 0.499 | 0.408 | 0.263 | 2.325 | 0.495 | 3.080 |
| Median | 0.111 | 0.780 | 9.000 | 0.685 | 56.500 | 0.327 | 0.416 | 0.178 | 2.170 | 0.540 | 2.868 |
| Maximum | 0.385 | 0.900 | 15.000 | 0.926 | 113.000 | 2.488 | .973 | 0.932 | 5.425 | 0.820 | 6.610 |
| Minimum | 0.000 | 0.500 | 4.000 | 0.010 | 8.000 | 0.020 | 0.000 | 0.031 | 0.878 | -0.139 | 1.078 |
| Std. Dev. | 0.145 | 0.084 | 2.627 | 0.262 | 24.223 | 0.460 | 0.341 | 0.220 | 0.947 | 0.207 | 1.053 |
| Skewness | 7.434 | -0.970 | 0.078 | -0.300 | 0.2067 | 1.371 | 0.049 | 1.336 | 0.736 | -0.658 | 0.630 |
| Kurtosis | 108.761 | 4.090 | 2.316 | 1.540 | 2.058 | 5.136 | 1.412 | 3.820 | 2.870 | 2.578 | 2.763 |
| Jacque-Bera | 216722.5 | 94.089 | 9.342 | 47.293 | 20.106 | 229.5 | 48.053 | 148.3 | 41.5 | 36.2 | 31.2 |
| Probability | 0.000 | 0.000 | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Sum | 58.9 | 353.0 | 4118.0 | 274.5 | 27422.0 | 227.4 | 186.2 | 119.8 | 1060.2 | 225.7 | 1404.5 |
| Sum Sq. Dev. | 9.684 | 3.242 | 3139.570 | 31.183 | 266975.6 | 96.1 | 53.0 | 22.2 | 408.3 | 19.6 | 504.6 |
| Observations | 456 | 456 | 456 | 456 | 456 | 456 | 456 | 456 | 456 | 456 | 456 |

Table 4.1: Descriptive Statistics on Board Composition, Financial Leverage and Control Variables for Listed Firms

Source: Field Data, 2017

Table 4.1 show that the mean board gender diversity is 0.129 with a maximum and minimum of 0.385 and 0.000 respectively. Since gender diversity was measured as the percentage of women in a board in a particular financial year, it implies that on average, the listed firms in NSE have a board gender diversity of 12.9%. The high positive skewness value of 7.434 indicates that most firms have board gender diversities that are less than the mean. This mean value obtained compares unfavourably with board gender diversity reported by Leting *et al.* (2012) of 7% but favourably with that reported by Chemweno (2016) of 14% among listed firms in the NSE. Similarly, Wachudi and Mboya (2012) report an 11% gender diversity among listed commercial banks in the NSE. The value obtained is far much higher than that reported by Shkolnikov (2011) for Kuwait (2.7%), Oman (2.3%), Bahrain (1.0%) and United Arab Emirates (0.8%). The difference in the national values reported could arise from national differences in affirmative action, in samples and panel data lengths used in the different studies. Since the guidelines on corporate governance practices by listed companies in Kenya (GoK, 2003) compel listed firms to have at least a third of their directors as women, it implies that listed firms in NSE have not met this directive since the board gender diversity is consistently below 30%.

Mean board independence reported is 0.774 with the highest and lowest being 0.900 and 0.500 respectively. In line with prior studies (Abeysekera, 2010; Dunstan *et al.*, 2011; Njuguna and Obwogi, 2015; Chemweno, 2016), board independence is operationalized as the proportion of non-executive directors in the board of directors in a particular financial year. This indicates that board independence among the listed firms is averagely 77.4%. The guidelines on corporate governance practices by listed companies in Kenya (GoK, 2003) compel listed firms to have at least a third of their directors as non-executive directors. The results presented indicate that listed firms have met this directive. The skewness figure of -0.970 shows that most have board independence proportions

that are higher than the mean of 0.774. The reported findings are in tandem with values reported by Njuguna and Obwogi (2015) for listed firms in East Africa stock exchanges of 0.734, and Chemweno (2016) and Abeysekera (2010) who report mean board independent values of 0.598 and 0.659 respectively for firms listed at the NSE. However, the value is lower than that of 85% reported by Horvath and Spirollari (2012) for USA firms and Dunstan *et al.* (2011) for New Zealand listed firms. This generally implies that boards of listed firms in the NSE are generally greatly independent.

Results presented in Table 4.1 further show that mean board size is 9.030 with maximum and minimum of 15.00 and 4.00 respectively. Board size was measured by the number of directors attending board meetings in a particular financial year in line with previous studies (Leting *et al.*, 2012; Njuguna and Obwogi, 2015; Chemweno, 2016). The value obtained in this study compares favourably with that reported by Njuguna and Obwogi (2015) who reported a mean board size of 9 with a maximum of 16 and a minimum of 3 for firms listed at security exchanges in East Africa. Conversely, Chemweno reports a mean board size of nine with a maximum and a minimum of 15 and 3 respectively for listed firms in the NSE. However, the value is much higher compared to the mean board size of 6.5 reported by Dunstan *et al.* (2011) for listed firms in New Zealand. The skewness value of 0.078 obtained shows that most listed firms have board sizes oscillating around the mean board size of nine, which implies that most of the firms prefer board sizes of about nine members.

Mean financial leverage reported in Table 4.1 is 0.602 with the highest and lowest being 0.926 and 0.010 respectively. Financial leverage was measured using the Debt to Equity Ratio with a ratio of 1.00 indicating that the firm's assets are fully financed by liabilities, and a ratio of 0.00 indicating that the firm's assets are all equity financed (Pandey, 2010). The mean Debt Ratio value

obtained for listed firms in the NSE implies that the assets of the listed firms are averagely financed by 60.2% liabilities. The firm with the highest leverage ratio finances its activities with 92.6% liabilities while that with the lowest leverage has a 1.0% liability financing. This mean financial leverage value obtained compares unfavourably with that reported by Ayot (2011) of 46% with a maximum and minimum of 100% and 14.4% respectively. The wide disparity in the minimum value may be attributed to the difference in samples between the two studies with Ayot (2011) studying non-financial listed firms only. Javeed *et al.* (2014) report average financial leverage of 57.9% for firms in Pakistan. Nevertheless, this implies that on average, listed firms in Kenya rely more on borrowed funds to finance their activities, which further implies that the firms are exposed to risk.

The mean firm age reported for listed firms in the NSE form Table 4.1 is 60.136 years with the oldest and youngest firms being 113 and 8 years respectively. Firm age is operationalized as the number of years of the firm since incorporation. The mean firm age value obtained in the present study is consistent with that reported by Leting *et al.* (2012) and Chemweno (2016) of 59 years and 57 years respectively albeit with different samples and panels. Leting *et al.* (2012) assert that firms that are over 50 years have been in existence for long and are therefore stable enough since they have survived the cyclical cycles. The mean value for firm age obtained therefore shows that the average firm at the NSE is stable. This is further confirmed by the skewness value of 0.2067, which indicates that most firms have their ages oscillating just below the mean of 60 years.

In line with prior studies (Ayot, 2011; Njuguna and Obwogi, 2015), firm size is measured by the ratio of sales to total assets with a value of 1.00 indicating that sales equal total assets. The mean firm size value obtained of 0.499 shows that firms on average have sales that are half their total assets. However, the largest firm has sales equalling to 2.488 times the total assets while the

smallest firm has sales equalling to 0.020 of total assets. This value compares unfavourably with the mean value obtained by Ayot (2011) of 1.091 who studied non-financial firms listed at the NSE. This implies that an average listed firm in the NSE is small-sized.

Values obtained for mean, maximum and minimum asset tangibility for the listed firms in the NSE are 0.408, 0.973 and 0.00 respectively. In tandem with prior studies (Haris and Raviv, 1991; Ayot, 2011; Mule and Mukras, 2015) asset tangibility is operationalized as the ratio of non-current assets to total assets. This implies that across the sample of listed firms in the NSE, 40.8% of the assets are non-current and about 59.2% are current. The wide difference between the firms with high tangibility ratios of 97.3% and those with low tangibility ratios of 0.00% indicate that some firms have high levels of non-current assets while others have high levels of current assets. The mean value for asset tangibility obtained in the current study compares favourably with that reported by Mule and Mukras (2015) of 55.6%, and that of 56% reported by Ayot (2011).

Performance of firms in the present study was measured by Value-Added Intellectual Capital (VAIC) and its sub-components of Capital Employed Efficiency (CEE), Human Capital Efficiency (HCE) and Structural Capital Efficiency (SCE). Mean VAIC across the whole sample of firms listed at the NSE is shown to be 3.080. This implies that every shilling employed by firms listed at the NSE adds a value equivalent to 3.080 shillings in total capital. The value obtained is slightly higher than that reported by Bohdanowicz and Urbanek (2013) for listed firms in Poland of 2.8515 and that of 2.063 by Saleh *et al.* (2009) for listed firms in Malaysia. This shows that effectiveness of intellectual capital of listed firms in Kenya seems to be higher than for both Polish and Malaysian firms.

As asserted by Pulic (2000), human capital efficiency (HCE) refers to the efficiency to which the collective value of the organization's intellectual capital embedded in competencies, knowledge, and skills of its human resource has been used to generate value for the firm. Structural capital efficiency (SCE) indicates how the competitive intelligence, formulas, information systems, patents, policies and processes arising from the products or systems created by the firm over time are generating more value for the firm. Capital employed efficiency (CEE) on the other hand can be defined as efficiency of the total capital harnessed in a firm's fixed and current assets.

The reported CEE across the listed firms of 0.263 is lower than the 0.5342 for Polish listed firms, but higher than the 0.043 for Malaysian listed firms. Similarly, the reported HCE of 2.325 for listed firms in the NSE compares favourably but is higher than that reported by Bohdanowicz and Urbanek (2013) for Polish firms and Saleh *et al.* (2009) for Malaysian firms of 1.9413 and 2.221 respectively. Moreover, SCE reported for Polish and Malaysian listed firms of 0.3494 and -0.202 is lower than the 0.4950 for listed firms in the NSE. These differences may result from the different sample structures, economic environments and time observations. It generally implies that human capital is more efficient in creating value.

Comparative sectoral descriptive statistics was also conducted for the different variables. This was necessary to compare how board composition variables, the financial leverages, and the value-added financial performance measures compare across the different sectors. Results are reported in Table 4.2.

Table 4.2: Sectoral Descriptive Statistics on Board Composition, Financial Leverage and Control Variables for Listed Firms

| Sector | Firms | BGDIV | BIND | BSIZ | FLG | FAGE | FSIZ | TANG | CEE | HCE | SCE | VAIC |
|----------------------|--------------|--------------|-------------|-------------|------------|-------------|-------------|-------------|------------|------------|------------|-------------|
| Agriculture | 7 | 0.039 | 0.771 | 6.024 | 0.340 | 74.52 | 0.594 | 0.766 | 0.375 | 1.930 | 0.420 | 2.724 |
| Automobile | 3 | 0.053 | 0.820 | 7.222 | 0.599 | 56.83 | 0.780 | 0.594 | 0.200 | 2.364 | 0.530 | 3.094 |
| Banking | 9 | 0.190 | 0.740 | 10.47 | 0.842 | 56.50 | 0.208 | 0.023 | 0.155 | 2.900 | 0.597 | 3.651 |
| Commercial | 4 | 0.155 | 0.758 | 10.75 | 0.723 | 60.00 | 0.719 | 0.642 | 0.297 | 2.097 | 0.443 | 2.837 |
| Construction | 4 | 0.112 | 0.761 | 9.958 | 0.528 | 58.25 | 0.546 | 0.758 | 0.323 | 2.501 | 0.487 | 3.291 |
| Energy | 2 | 0.130 | 0.817 | 6.260 | 0.594 | 33.48 | 0.182 | 0.664 | 0.343 | 1.645 | 0.350 | 2.337 |
| Insurance | 3 | 0.109 | 0.797 | 9.722 | 0.826 | 71.83 | 0.409 | 0.019 | 0.388 | 1.962 | 0.408 | 2.758 |
| Investment | 2 | 0.146 | 0.834 | 9.040 | 0.250 | 40.50 | 0.241 | 0.134 | 0.210 | 2.191 | 0.521 | 2.920 |
| Manufacturing | 4 | 0.197 | 0.785 | 10.67 | 0.477 | 62.25 | 0.861 | 0.522 | 0.158 | 2.430 | 0.558 | 3.146 |

Source: Field Data, 2017

Table 4.2 shows that the banking sector has the highest number of firms while the energy and investment sectors has the lowest. The high representation of firms from the banking sectors among the listed firms is presumed to be due to the firms' operating nature, which requires that they raise huge capital for investment from the NSE. It is further shown that sectors with the lowest number of female as directors as agriculture and automobile with board gender diversity means of 0.039 and 0.053 respectively while the manufacturing and banking sectors had the highest number of female directors in their boards with means of 0.197 and 0.190 respectively. The high number of female directors in the manufacturing and banking sectors may be attributed to the need to improve the images of the firms in the sectors since the firms offer competitive products unlike those in the agriculture and automobile industries that offer unique products (Dustan *et al.*, 2011). However, the general board gender diversity for all the firms is below the requirement by Guidelines on corporate governance practices by listed companies in Kenya (GoK, 2003) which require that at least a third of the directors in a public organization should be of either gender.

Sectoral analysis of board independence shows that investment, automobile and the energy sectors have the highest number of independent directors with means of 0.834, 0.820 and 0.817 respectively, while banking, commercial and construction sectors have the lowest number of independent directors with means of 0.740, 0.758 and 0.761 respectively. According to Chen and Jaggi (2000), firms with a higher percentage of non-executive directors in their boards tend to be those that require more engagement with the stakeholders and therefore seek to provide more statutory disclosures. This assertion is contrary to findings in this study since firms in sectors like banking and commercial, which require more disclosures have low board independence levels (Dunstan *et al.*, 2011).

Sectors that register the highest board sizes are commercial, manufacturing and banking with means of 10.75, 10.67 and 10.47 respectively, while those with the lowest board sizes are agriculture, energy and automobile with means of 6.024, 6.260 and 7.222 respectively. Firms will tend to have larger boards if they seek to increase the pool of expertise needed in their firms (Dalton *et al.*, 1999). This seems to explain the large board size in firms in the commercial, manufacturing and banking sectors that require different experts as opposed to firms in the agriculture, energy and automobile industries.

Financial leverage was measured as the ratio between total liabilities and total assets and sectoral comparison indicates that firms in the banking, insurance and commercial sectors record the highest financial leverage levels with means of 0.842, 0.826 and 0.723 respectively. Sectors that have the lowest financial leverages are investment, agriculture and manufacturing with means of 0.250, 0.340 and 0.477 respectively. This compares favourably with mean financial leverage comparisons obtained by Mule and Mukras (2015) who report that insurance and banking sectors have highest financial leverages. Firms will seek debt capital if they deal in financial services such as lending and borrowing money.

Firm financial performance is operationalized by VAIC which has three sub-components; CEE, HCE and SCE. Table 4.2 shows that the banking, construction and manufacturing sectors have the highest VAIC levels with means of 3.651, 3.291 and 3.146 respectively. On the contrary, firms in the energy, agriculture and insurance sectors have the lowest VAIC levels with means of 2.337, 2.724 and 2.758 respectively. This compares unfavourably with values reported by Mule and Mule (2015) who measure firm performance by using both Tobin's Q, ROA and ROE. In the said study, telecommunications, commercial and manufacturing report highest Tobin's Q means of 2.849,

2.114 and 1.985 respectively while insurance, construction and commercial sectors report the highest financial performance based on ROE with means of 0.208, 0.201 and 0.193 respectively.

4.2 Effect of Board Composition on Value-Added Financial Performance of Firms Listed at the NSE

The first objective of the study sought to establish the effect of board composition on value-added financial performance of firms in the NSE. Table 4.3 presents results on the correlation between board composition and value-added financial performance of firms listed at the Nairobi Securities Exchange (NSE).

Table 4.3: Correlation of Board Composition with VAIC for Firms Listed at NSE

*** $p < 0.05$

| | BGDIV | BIND | BSIZ | FSIZ | FAGE | TANG | VAIC |
|--------------|------------------------------|------------------------------|------------------------------|------------------------|--------------------|------------------------|-----------------|
| BGDIV | 1.0000 | | | | | | |
| BIND | ----- -0.1612 (0.0709) | 1.0000 | | | | | |
| BSIZ | 0.1092 (0.0513) | ----- -0.1210 (0.0511) | 1.0000 | | | | |
| FSIZ | -0.1242 (0.0690) | 0.0112 (0.0601) | ----- -0.0833 (0.0528) | 1.0000 | | | |
| FAGE | 0.0559 (0.5100) | -0.1762 (0.0591) | 0.0718*** (0.0000) | 0.2250*** (0.0000) | 1.0000 | | |
| TANG | -0.1925 (0.0581) | -0.0202 (0.0622) | -0.2990 (0.0710) | 0.2303 (0.0591) | 0.0634 (0.0600) | 1.0000 | |
| VAIC | 0.1402*** (0.0000) | -0.2130*** (0.0401) | 0.3040*** (0.0000) | -0.0377*** (0.0011) | 0.1717 (0.0610) | -0.2033*** (0.0010) | 1.0000 ----- |

Source: Field Data, 2017

Correlation analysis shows the direction, strength and significance of the relationships among the variables of study (Sekaran, 2000). Since board composition was operationalized by board gender diversity, board independence and board size, results in Table 4.3 show a weak positive but significant correlation between board gender diversity and firm financial performance measured

by VAIC ($r = 0.1402$; $p = 0.0000$). This implies that a 14.02% increase in board gender diversity results in a corresponding increase of 14.02% in value-added financial performance, which is consistent with empirical literature (Dunstan *et al.*, 2011; Garba and Abubakar, 2014; Ongore *et al.*, 2015), which found a positive significant correlation between board gender diversity and firm financial performance. However, the findings contradict those by Wachudi and Mboya (2012) and Leting *et al.* (2012) who reported a negative but insignificant correlation between board gender diversity and firm financial performance. The results therefore confirm that firms listed at the NSE could differ in value-added financial performance based on the number of women in their boards.

Additionally, results in Table 4.3 shows that board independence and firm financial performance are negatively but significantly correlated ($r = -0.2130$; $p = 0.0401$) implying that a 21.3% increase in board independence leads to a significant reduction in value-added financial performance by 21.3%. This is in tandem with prior literature (Horvath and Spirollari, 2012; Garba and Abubakar, 2014; Ongore *et al.*, 2015; Chemweno, 2016). This implies that increasing independent directors could be an impediment to value addition among the listed firms in the NSE. Dunstan *et al.* (2011) observe that independent directors prefer conservative business strategies in order to protect shareholders, which in the end may lower firm financial performance.

Table 4.3 further reveals that board size is positively and significantly associated with firm financial performance ($r = 0.3040$; $p = 0.0000$) implying that a 30.4% increase in board size leads to a 30.4 % significant increase in value-added financial performance for the NSE listed firms. This is consistent with findings by Adams and Mehran (2008), Belkhir (2009), Abidin *et al.*, (2009), Bermig, and Frick (2010) which seem to confirm that firms with large board sizes could have operational advantages leading to higher value-addition. However, the results contradict findings by Amran (2011), Adusei (2011), Obradovich and Gill (2013) and Ongore *et al.* (2015)

who reported negative significant associations between board sizes and financial performance, and Garba and Abubakar (2014) who found no significant relationship between the variables.

To achieve results for the first objective, a null hypothesis, H_{01} , assuming that board composition has no effect on value-added financial performance was formulated. Fixed effects multiple regression analysis was conducted to establish the effect of board composition on value-added financial performance. Table 4.4 presents the results.

Table 4.4: Effect of Board Composition on Value-added Financial Performance

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------------|--------------------|-------------------|--------------------|--------------|
| C | 3.4997 | 0.5365 | 6.5231 | 0.0000 |
| BGDIV | 0.2737 | 0.0211 | 12.972 | 0.0000 |
| BIND | -0.2430 | 0.0726 | -3.3471 | 0.0015 |
| BSIZ | 0.2934 | 0.0690 | 4.2520 | 0.0000 |
| FSIZ | -0.0291 | 0.1054 | -0.2761 | 0.0783 |
| FAGE | 0.0054 | 0.0020 | 2.6796 | 0.0076 |
| TANG | -0.4124 | 0.1447 | -2.8512 | 0.0046 |
| R-Squared | 0.3528 | | | |
| Adj. R-Squared | 0.3412 | | | |
| S.E. of Reg. | 0.9758 | | | |
| F-Stat. | 13.494 | | | |
| Prob. (F-Stat) | 0.0000 | | | |
| Durbin-Watson Stat. | 2.0039 | | | |

Source: Field Data, 2017

Results of the analysis in Table 4.4 show that board gender diversity is a significant positive predictor of value-added financial performance ($\beta = 0.2737$, $p = 0.000$). This implies that a unit increase in board gender results in an increase of 27.37% in value-added financial performance. This result supports what Dunstan *et al.*, (2011), Garba and Abubakar (2014) and Ongore *et al.*

(2015) report of a positive significant effect of board gender diversity on firm financial performance. However, they contradict those by Wachudi and Mboya (2012) and Leting *et al.* (2012) who report a weak negative effect of board gender diversity on firm financial performance. The results therefore reveal that firms listed at the NSE could differ in performance based on the number of women in their boards with those having more women outperforming those with less women. This result supports the Resource Dependency Theory which proposes that more directors offer more board capital, which consists of both human capital (experience, expertise and reputation), and relational capital (network of ties to other firms and external contingencies). Carter *et al.* (2003) observe that the presence of more women in boards is desirable since it brings a better understanding of the market place and it increases creativity and innovativeness, which improves firm value. Moreover, women tend to ask more questions than men do especially on investment decisions, which may prevent imprudent investments. It seems to imply therefore that the small number of female directors observed among firms listed at the NSE hinders the firms' value-added financial performance (Carter *et al.*, 2003).

Additionally, Table 4.4 reveals that board independence is a significant negative predictor of value-added financial performance ($\beta = - 0.2430$, $p = 0.0015$) implying that a unit increase in the value of board independence results to a decrease of 24.30% in value-added financial performance. This results support prior empirical findings (Horvath and Spirollari, 2012; Garba and Abubakar, 2014; Al-Musalli and Ismail, 2012; Ongore *et al.*, 2015; Chemweno, 2016). However, they are at variance with the findings by Abidin *et al.* (2009) and Mahmudi and Nurhayati (2014) who established that board independence enhances financial performance. The result therefore disapproves the Resource Dependency Theory, which advocates for more independent directors in boards. According to Dunstan *et al.* (2011), independent directors could impede financial

performance of firms since they prefer conservative business strategies in order to protect shareholders. The negative effect of board independence on value-added financial performance among the firms listed at the NSE could therefore be interpreted that the firms are performing poorly in terms of value addition due to the high number of independent directors. Many independent directors may increase the tendency by the firms to pursue less risky investments to protect shareholders' value.

Board size is found to be a positive significant predictor of value-added financial performance ($\beta = -0.2934, p = 0.0000$) implying that a unit change in board size results in an increase in value-added financial performance of 29.34%. This is consistent with findings by Adams and Mehran (2008), Belkhir (2009), Abidin *et al.*, (2009) and Bermig and Frick (2010) which seem to confirm the tenets of the Resource Dependency Theory that firms with large board sizes have operational advantages leading to higher value-addition. However, the results are at variance with findings by Amran (2011), Adusei (2011), Obradovich and Gill (2013) and Ongore *et al.* (2015) who report negative significant effect of board size on financial performance. Practically, the results imply that the smaller board sizes in listed firms in the NSE do not give them operational advantages.

The reported coefficient of determination (R^2) of 0.3528 shows that board composition elements together with the control variables predict 35.28% of value-added financial performance with other variables not included in the model predicting the remaining 64.72% of value-added financial performance. The coefficient of determination measures the quality of the model and its linear approximation. It therefore implies that the model is poor but is still a significant predictor of value-added financial performance. The null hypothesis, H_{01} , that board composition has no effect on value-added financial performance is rejected based on the findings. It is therefore concluded

that board composition has a significant effect of value-added financial performance of listed firms in the NSE.

4.3 Effect of Financial Leverage on Value-added Financial performance

The second objective of the study sought to analyse the effect of financial leverage on value-added financial performance for firms listed at the NSE. A null hypothesis, H_{o2} that financial leverage has no effect on value-added financial performance was formulated. Table 4.5 presents fixed-effects regression results for the relationship.

Table 4.5: Effect of Financial Leverage on VAIC for Listed Firms

| Dependent Variable: VAIC | | | | |
|-----------------------------------|--------------------|-------------------|--------------------|--------------|
| Included Observations: 456 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 1.2556 | 0.3354 | 3.7435 | 0.0003 |
| FLG | -0.4502 | 0.0943 | -4.7754 | 0.0000 |
| FSIZ | -0.0077 | 0.0107 | -0.7234 | 0.4707 |
| FAGE | 0.0038 | 0.0627 | -0.0624 | 0.9504 |
| TANG | -0.0418 | 0.0613 | 0.6822 | 0.4963 |
| R-Squared | 0.2223 | | | |
| Adj. R-Squared | 0.1934 | | | |
| S.E. of Regression | 0.3344 | | | |
| F-Statistic | 7.7134 | | | |
| Prob (F-Statistic) | 0.0000 | | | |
| Durbin-Watson Stat. | 1.8912 | | | |

Source: Field Data, 2017

Financial leverage was operationalized as the Debt-to-Equity Ratio which is the ratio between total liabilities and total assets. This was necessary since the Debt-to-Equity Ratio captures the true value of the indebtedness of a firm by comparing the value of the total assets financed by total liabilities. The panel regression results presented in Table 4.5 indicate that there is a negative significant relationship between financial leverage and firm financial performance measured by

VAIC ($\beta = -0.4502$; $p = 0.0000$) which seems to suggest that a unit increase in financial leverage by a firm listed in the NSE punishes it significantly by reducing value-added financial performance by 45.02%. Pandey (2010) argues that increased use of financial leverage for low growth firms (such as those in the developing countries such as Kenya) increases the firms' default risk which scares away potential investors while spooking existing investors causing demand for the firms' stock price to decrease hence reducing value addition. Firms listed at security markets in developing countries such as Kenya have been shown to be growing slowly and could therefore be exposed to high financial risks if they increase their financial leverage levels hence decreasing their value-added financial performance. It therefore implies that an average listed firm in the NSE has unfavourable financial leverage level that increases its' risk hence decreasing value.

Table 4.5 shows that the coefficient of determination value ($R^2 = 0.2223$) shows that financial leverage and the other control variables contribute only 22.23% to VAIC. The findings robustly support the Trade-off Theory of financial leverage. According to Berzkaine and Zelgave (2015), companies finance their needs of capital through a combination of debt and equity funds without a complete dependence on a single source. Accordingly, there is an advantage of financing through debt which is the tax shield, and there is a cost of financing through debt which is the interest paid and the costs of financial distress of the possibility of bankruptcy of the company. Within these facts, companies seek to reach to the optimal capital structure by balancing between the benefits and the costs of each source of finance.

Results in Table 4.5 are consistent with findings by Tian and Zeitun (2007), Maina and Ishmael (2014) and Mule and Mukras (2015) when measuring firm performance with ROA and Tobin's Q. However, Berger and Bonaccorsi di Patti (2006), Javeed *et al.* (2014) and Akhtar *et al.* (2012) report findings that contradict this study's findings. Findings on the relationship between financial

leverage and value-added financial performance could imply that increased borrowings hasten the separation between shareholders and lenders which may hinder the firms listed at the NSE from generating more profitable projects hence resulting in low value addition among the firms. The null hypothesis, H_{o2} , which was formulated that financial leverage has no effect on value-added financial performance among firms in the NSE is therefore not supported by findings in the present study. It therefore implies that financial leverage has an effect value-added financial performance.

4.4 Mediating Effect of Financial Leverage on the Relationship between Board Composition and Value-added Financial Performance of Firms in the NSE

The third objective sought to examine the mediating effect of financial leverage on the relationship between board composition and value-added financial performance of firms in the NSE. Therefore, a null hypothesis, H_{o3} assuming that financial leverage has no mediating effect on the relationship between board composition and value-added financial performance of firms in the NSE was formulated.

Hierarchical regression method as proposed by Baron and Kenny (1986) was followed to meet the objective. This was done in three steps; first, regressing the mediator on the independent variable ; second, regressing the dependent variable on the independent variable, and; third, regressing the dependent variable on both the independent variable and the mediator. Since the second step in mediation is presented as part of objective one (Table 4.4), the first and the third steps in the hierarchical regression are done in this section. Preliminary results in Table 4.4 indicate that condition two is met for all the three proxies of board composition. Table 4.6 and Table 4.7 presents test for the first and third conditions respectively.

Table 4.6: Effect of Board Composition on Financial Leverage of listed firms

| Dependent Variable: FL | | | | |
|-----------------------------------|--------------------|-------------------|--------------------|--------------|
| Included Observations: 456 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 0.6189 | 0.1177 | 5.2591 | 0.0000 |
| BGDIV | -0.2255 | 0.0137 | -16.460 | 0.0439 |
| BIND | -0.1886 | 0.0856 | -2.2033 | 0.1340 |
| BSIZ | -0.2068 | 0.0980 | -2.1102 | 0.0000 |
| FSIZ | -0.0949 | 0.0231 | -4.1030 | 0.0000 |
| FAGE | 0.0006 | 0.0004 | 1.4397 | 0.1506 |
| TANG | -0.2728 | 0.0317 | -8.5958 | 0.0000 |
| R-Squared | 0.3403 | | | |
| Adj. R-Squared | 0.3315 | | | |
| S.E. of Reg. | 0.2140 | | | |
| F-Stat. | 38.607 | | | |
| Prob. (F-Stat.) | 0.0000 | | | |
| Durbin-Watson Stat. | 1.9011 | | | |

Source: Field Data, 2017

Table 4.6 shows that the first condition of mediation is met for two elements of board composition: board size ($\beta = -0.2068, p = 0.0000$) and board gender diversity ($\beta = -0.2255, p = 0.0439$), but not for board independence ($\beta = 0.1886, p = 0.1340$). Specifically, Table 4.6 reveals that a unit increase in board size for an average firm in the NSE results into a 20.68% decrease in financial leverage for the listed firms. Similarly, a unit increase in board gender diversity results into a 22.55% decrease in financial leverage. This could imply that increasing the absolute number of directors and the number of female directors could make management to pursue lower-leverage policies among the firms listed at the NSE. Board independence as a construct of board composition cannot however be mediated by financial leverage since board independence decisions do not influence financial leverage. Table 4.7 evaluates the third condition of mediation.

Table 4.7: Effect of Financial Leverage on the relationship between Board Composition and VAIC for Listed Firms

| Dependent Variable: VAIC | | | | |
|-----------------------------------|--------------------|-------------------|--------------------|--------------|
| Included Observations: 456 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 2.0319 | 0.5468 | 3.7160 | 0.0000 |
| BGDIV | 0.1007 | 0.0219 | 4.5982 | 0.0006 |
| BIND | -0.2162 | 0.1866 | -2.4965 | 0.0650 |
| BSIZ | 0.1109 | 0.0139 | 7.9784 | 0.0000 |
| FSIZ | -0.0954 | 0.1063 | -0.8980 | 0.0369 |
| FAGE | 0.0059 | 0.0020 | 2.9248 | 0.0036 |
| TANG | -0.0602 | 0.0024 | -25.083 | 0.0041 |
| R-Squared | 0.4266 | | | |
| Adj. R-Squared | 0.4012 | | | |
| S.E. of Reg. | 88.610 | | | |
| F-Stat. | 17.486 | | | |
| Prob (F-Stat.) | 0.0000 | | | |
| Durbin-Watson Stat. | 1.8190 | | | |

Source: Field Data, 2017

Table 4.7 reveals that after introducing financial leverage into the model, the effects of both board gender diversity ($\beta = 0.1007$, $p = 0.0006$) and board size ($\beta = 0.1109$, $p = 0.000$) reduce but still remain significant in influencing firm value-added financial performance. However, board independence becomes insignificant ($\beta = -0.2162$, $p = 0.0650$). Since the beta values for both board gender diversity and board size reduce but remain significant after introduction of financial leverage into the model, it implies that partial mediation is present. This implies that both board size and board gender diversity partially but significantly influence value-added financial performance for firms listed at the NSE through their influence on financial leverage.

To test the significance of the mediation effect, the conservative Sobel-Goodman test was employed. The Judd and Kenny (1981) Difference of Coefficients approach was first used to obtain the indirect effects for both board gender diversity and board size. The approach involved subtracting the partial regression coefficients (Table 4.7) from the simple regression coefficients (Table 4.4). The indirect effect values obtained were 0.1730 (0.2737 – 0.1007) and 0.1828 (0.2934 – 0.1109) for board gender diversity and board size respectively. The Sobel-Goodman test statistic (Z) for significance of indirect effect is used. The Z -values are obtained using the following formula:

$$Z = \frac{a \times b}{\sqrt{b^2 \times s_a^2 + a^2 \times s_b^2}}$$

Where: a is the coefficient of the independent variable predicting the mediator variable,

b is the coefficient of the mediator variable predicting the dependent variable,

s_a is the standard error of the independent variable predicting the mediator variable,

s_b is the standard error of the mediator variable predicting the mediator.

Using the formula, the Z -value for the indirect effect of board gender diversity through financial leverage obtained is 2.072, while that of board size is 2.155. As asserted by Ramli and Nartea (2016), the null hypothesis of no significant mediating effect is rejected if the Z -values exceeds critical value of 1.96 at $p < 0.05$. The null hypothesis was therefore rejected for both variables. It was therefore concluded that the indirect effect for both variables is significant.

A summary of the steps proposed by Baron and Kenny (1986) in relation to the analysis is presented in Table 4.8.

Table 4.8: Summary for Mediating Role of Financial Leverage on the Relationship between Board Composition and VAIC for Listed Firms

| Var. | Step 1 Beta | Step 2 Beta (η) | Step 3 Beta | Type of Effect | Partial Regression Beta (η') | Indirect Effect ($\eta - \eta'$) | Z-value (Critical Value = 1.96) |
|-------------|------------------------|--|------------------------|---------------------------|---|--|--|
| BGDI | - 0.2255*** | 0.2737*** | 0.2007*** | Partial | 0.1007*** | 0.1730 | 1.0390*** |
| BIND | - 0.1886 | - 0.2430*** | - 0.2162 | - | -0.2162 | - | - |
| BSZ | - 0.2068*** | 0.2934*** | 0.1109*** | Partial | 0.1109*** | 0.1828 | 0.9551*** |

Source: Field Data, 2017

Note: Step 1: Regression of the Mediator Variable on the Independent Variable

Step 2: Regression of the Dependent Variable on the Independent Variable

Step 3: Regression of Dependent Variable on both the Independent Variable and Mediator Variable

*** $p < 0.05$

Table 4.8 indicates that the three conditions as proposed by Baron and Kenny (1986) are fulfilled for only two elements of board composition; board gender diversity and board size. It is shown that for every unit increase in board gender diversity, there is a significant increase of about 17.30% in that proportion of value-added financial performance that is mediated by financial leverage. Similarly, for every unit increase in board size, there is a significant increase of 18.28% in that proportion of value-added financial performance that is mediated by financial leverage. Therefore, financial leverage partially but significantly mediates the relationship between both board gender diversity and board size and firm value-added financial performance implying that the two variables are necessary in influencing financial leverage which will in turn influence value-added financial performance. However, since mediation is found to be partial, it implied that the two variables are not dominant mediators.

Since both board gender diversity and board size have a negative significant effect on financial leverage of the listed firms, the mediation results presented seem to suggest that presence of women in board of directors could help reduce financial leverage levels among firms in the NSE which in turn could increase firm value-added financial performance. Additionally, it is implied that having more board members in the board of the listed firms could help improve firm value-added financial performance. The reduction in financial leverage levels in the firms associated with more women in the board could arise from theoretical underpinnings that women are more risk averse and tend to ask more questions than men and would therefore question high financial leverage levels. Larger boards could also influence reduction of financial leverage levels among the firms listed at the NSE by questioning investment decisions hence improving value-added financial performance.

The null hypothesis, H_{03} for this objective was that financial leverage has no mediating effect on the relationship between board composition and value-added financial performance of firms in the NSE. Results from the analysed data indicate that the hypothesis is rejected for two elements of board composition; board gender diversity and board size, while we fail to reject the null hypothesis for board independence. The results of the mediating role of financial leverage in the present study for board gender diversity and board size are consistent with findings by Okiro *et al.* (2015) and Ramli and Nartea (2016) who find that financial leverage has a significant mediating effect between macro-economic factors and corporate governance respectively and firm financial performance. Ramli and Nartea (2016) specifically find that financial leverage significantly mediates the relationship between firm size and business risk and firm financial performance. On the contrary however, the results contradict Ramli and Nartea's (2016) establishment that financial

leverage does not mediate the relationship between firm asset structure, liquidity, and interest rates and firm financial performance.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of findings and conclusions and recommendations for the study. Limitations and delimitations of the study are also presented herein. Finally, suggested areas for further research are suggested.

5.1 Summary of Findings

The study's first objective was to establish the effect of board composition on value-added financial performance. Board composition was operationalized by board gender diversity, board independence and board size. A weak positive but significant effect is established between board gender diversity and value-added financial performance. Additionally, the study establishes a positive significant effect of board size on value-added financial performance. However, a negative significant effect is found to exist between board independence and value-added financial performance for the firms listed at the NSE.

The second objective of the study was to analyse the effect of financial leverage on value-added financial performance. Fixed effects panel data analysis shows that financial leverage has a negative significant effect on value-added financial performance for firms listed at the NSE.

Results based on the third objective which was to examine the effect of financial leverage on the relationship between board composition and value-added financial performance reveal that financial leverage has no mediating effect between board independence and value-added financial performance for firms listed at the NSE. However, it is established that financial leverage has a partial but significant mediating effect between both board gender diversity and board size, and value-added financial performance for firms listed at the NSE.

5.2 Conclusion

Based on the summary of findings presented, three conclusions can be drawn. The first conclusion based on the first objective is that board gender diversity and board size are important positive predictors of firm value-added financial performance. This confirms the Resource Dependency Theory, which implies that increasing the number of directors may be beneficial to the firm due to the increased and diverse pool of expertise that is available. However, this theory is disapproved for board independence whose findings seem to suggest that outside directors are more unlikely to align their decision-making processes with shareholders than management hence hindering value-added financial performance.

Evidence from the second objective leads us to conclude that financial leverage has a negative significant effect on firm value-added financial performance as measured VAIC which supports the Trade-off Theory. The study findings therefore propose that a negative significant effect of financial leverage on value-added financial performance for the firms listed at the NSE is feasible and therefore acceptable.

Since it was found that financial leverage partially but significantly mediates the relationship between both board gender diversity and board size and value-added financial performance, it is concluded that both board gender diversity and board size are important board composition elements since they influence the levels of value-added financial performance through their influence on financial leverage. The Agency Cost Theory is therefore confirmed for both board gender diversity and board size.

5.3 Recommendations of the Study

The following recommendations can be made based on the conclusions resulting from the findings of the study. Based on the first conclusion, it is recommended that listed firms in the NSE increase

the number of female directors in their boards and their absolute board sizes if they seek to increase their firm value-added financial performance. This will provide the firms with more channels of communication, provide timely and valuable information and reduce transaction costs in dealing with uncertainties. However, the number of non-executive directors should be decreased since it has been shown to impede firm value-added financial performance.

Based on the summary from the second conclusion, it is recommended that the listed firms in the NSE look more into internal financing rather than external financing in order to generate higher value-added financial performance. Additionally, the firms should finance their growth and investment opportunities through less risky ways such as retained earnings.

The third recommendation which is based on the third conclusion is that firms listed at the Nairobi Securities Exchange should seek to increase the number of women directors in their boards since women tend to question investment decisions which partially but significantly influences financial leverage decisions which in turn influence the firms' value-added financial performance. Additionally, the firms should seek to increase their board sizes in order to increase their board capital that will help reduce financial leverages, hence increasing firm value-added financial performance.

5.4 Limitations of the Study

The present study's findings, conclusions and recommendations may significantly contribute to the existing theoretical and empirical works in the fields of corporate governance, financial leverage and firm financial performance. Nevertheless, several limitations that may limit the general applicability of the findings can be identified.

First, the study was limited to only three elements of board composition; board size, board gender diversity and board independence. This alienates other equally important board composition

elements such as board age diversity, educational qualification and study specialisation that may equally be significant in influencing both financial leverage and financial performance. This implies that the entirety of board composition's influence on value-added financial performance was not analysed.

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

Third, the study was restricted in terms of data collection to those firms which were listed on or before 2002, and not after 2014, implying that a number of firms which were listed after this period were not included in the study even though they may be contributing immensely to Kenya's and global business environments.

Fourth, the study relied only on secondary data that was derived from the individual firms' financial statements filed with the NSE. Even though the data is prepared by following the laid down GAAPs, different firms use different accounting policies such as year-ends and rates of depreciation. However, data in the study was standardised by use of ratio analysis to remove this limitation.

Fifthly, the study used the difference of coefficients approach to calculate the indirect effects. Further, the Sobel-Goodman test was used to evaluate the significance of the indirect effects. While these two tools have been shown to have high predictive powers, they have previously been shown to be erroneous.

Lastly, some raw variables such as sales, liabilities and sales values are kept at their book values. This implies that the effect of inflation and time value of money during the different time periods was not factored in the financial statements. Additionally, many firms prepare their financial statements the historical cost basis of accounting regardless of whether there are changes in the general level of prices or increase in specific prices of assets held. To avoid adjustment for inflation and time value of money, ratios were used.

5.5 Suggestions for Further Research

Following the study's limitations, the following suggestions for further research are suggested. First, future researchers should include other variables of board composition so that their effect on value-added financial performance can be investigated.

Second, future studies should be designed to include non-listed firms and especially the small and medium scale companies that are not listed at the Nairobi Securities Exchange since they play a major role in the economic growth of Kenya. Moreover, comparative studies targeting firms listed in other developing counties could be conducted in order to come up with best practices for benchmarking. Sector-specific studies should also be conducted.

Third, future researchers should include all firms listed at the NSE using a longer longitudinal study in order to assess the long-run effect of board composition on value-added financial performance. The studies should consider using designs that are different from panel such as pure time series or pure cross-sectional surveys.

Fourth, future researchers should explore the use of alternative tests of significance by using bootstrapping and Structural Equation Model (SEM) that have been shown to have even higher predictive powers.

Lastly, since firm performance is a function of many factors and not only board composition and financial leverage, studies in the future should include other performance drivers such as liquidity risk, industry type and other macro-economic factors to assess their role on firm value-added financial performance.

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APPENDICES

APPENDIX I: AUTHORITY TO CONDUCT RESEARCH



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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Ref: No.

Date:

NACOSTI/P/17/43451/10510

8th November, 2017

Patrick Nyatete Kenyanya
Maseno University
Private Bag
MASENO

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "**Mediating Role of Financial Leverage on the Relationship between Board composition and Value-added Performance of Firms Listed in Nairobi Securities Exchange, Kenya**," I am pleased to inform you that you have been authorised to undertake research in Nairobi Securities Exchange and Capital Markets Authority for the period ending 9th December, 2017.

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

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County

The County Director of Education
Nairobi County



National Commission for Science, Technology and Innovation is ISO 9001:2008 Certified

APPENDIX II: LISTED COMPANIES IN THE NSE AS AT DECEMBER, 2014

| SECTOR/FIRM CODE | LISTED JAN 2003 | BY | INCLUDED IN SAMPLE | CODE |
|---------------------------------------|----------------------------|-----------|-------------------------------|-------------|
| AGRICULTURAL | | | | |
| 1. Eaagads Ltd. | ✓ | | ✓ | 1 |
| 2. Kakuzi Ltd | ✓ | | ✓ | 2 |
| 3. Kapchorua Tea Co. Ltd. | ✓ | | ✓ | 3 |
| 4. The Limuru Tea Co. Ltd | ✓ | | ✓ | 4 |
| 5. Rea Vipingo Plantations | ✓ | | ✓ | 5 |
| 6. Sasini Ltd. | ✓ | | ✓ | 6 |
| 7. Williamson Tea Kenya Ltd. | ✓ | | ✓ | 7 |
| AUTOMOBILES & ACCESORIES | | | | |
| 8. Car and General (K) Ltd | ✓ | | ✓ | 8 |
| 9. Marshalls (E.A) Ltd | ✓ | | ✓ | 9 |
| 10. Sameer Africa Ltd | ✓ | | ✓ | 10 |
| 11. CMC Holdings | × | | × | N/A |
| BANKING | | | | |
| 12. Barclays Bank of Kenya Ltd | ✓ | | ✓ | 11 |
| 13. CFC Stanbic of Kenya Holdings Ltd | ✓ | | ✓ | 12 |
| 14. Diamond Trust Bank Kenya Ltd. | ✓ | | ✓ | 13 |
| 15. Equity Bank Ltd | × | | × | N/A |
| 16. Housing Finance Group Ltd | ✓ | | ✓ | 14 |
| 17. I & M Holdings Ltd | × | | × | N/A |
| 18. NIC Bank Ltd. | ✓ | | ✓ | 15 |
| 19. Standard Chartered Bank of Kenya | ✓ | | ✓ | 16 |
| 20. The Co-operative Bank of Kenya | ✓ | | ✓ | 17 |
| 21. Kenya Commercial Bank | ✓ | | ✓ | 18 |
| 22. National Bank of Kenya | ✓ | | ✓ | 19 |
| COMMERCIAL AND SERVICES | | | | |
| 23. Express Kenya Ltd. Ord | ✓ | | ✓ | 20 |

| | | | |
|--|---|---|-----|
| 24. Hutchings Biemer Ltd | × | × | N/A |
| 25. Nation Media Group Ltd | ✓ | ✓ | 21 |
| 26. Standard Group Ltd | ✓ | ✓ | 22 |
| 27. TPS Eastern Africa Ltd | ✓ | ✓ | 23 |
| 28. Uchumi Supermarket Ltd | ✓ | ✓ | 24 |
| 29. Kenya Airways Ltd | × | × | NA |
| 30. Longhorn Kenya Ltd | × | × | N/A |
| 31. Scangroup Ltd | × | × | N/A |
| CONSTRUCTION & ALLIED | | | |
| 32. ARM Cement Ltd. | ✓ | ✓ | 25 |
| 33. Bamburi Cement Ltd. | ✓ | ✓ | 26 |
| 34. Crown Paints | × | × | N/A |
| 35. E.A. Cables Ltd | ✓ | ✓ | 27 |
| 36. E.A. Portland Cement Co. Ltd | ✓ | ✓ | 28 |
| ENERGY AND PETROLEUM | | | |
| 37. KenGen Co. Ltd | × | × | N/A |
| 38. KenolKobil Ltd. | ✓ | ✓ | 29 |
| 39. Kenya Power & Lighting Co. Ltd | ✓ | ✓ | 30 |
| 40. Umeme Ltd | × | × | NA |
| 41. Total Kenya | ✓ | ✓ | 31 |
| INSURANCE | | | |
| 42. British-American Investments Co | ✓ | ✓ | 32 |
| 43. CIC Insurance Group Ltd | × | × | N/A |
| 44. Jubilee Holdings Ltd. | ✓ | ✓ | 33 |
| 45. Liberty Kenya Holdings Ltd | × | × | N/A |
| 46. Pan Africa Insurance Holdings Ltd | ✓ | ✓ | 34 |
| 47. Kenya Re-Insurance Corporation Ltd | × | × | N/A |
| | | | |
| INVESTMENT | | | |
| 48. Centum Investment Co. Ltd. | ✓ | ✓ | 35 |

| | | | |
|--|---|---|-----|
| 49. Olympia Capital Holdings Ltd | ✓ | ✓ | 36 |
| 50. Trans-Century Ltd | × | × | N/A |
| MANUFACTURING & ALLIED | | | |
| 51. A. Baumann & Co. Ltd | × | × | N/A |
| 52. B.O.C Kenya Ltd. | ✓ | ✓ | 37 |
| 53. British American Tobacco Ltd | ✓ | ✓ | 38 |
| 54. Carbacid Investments Ltd | ✓ | ✓ | 39 |
| 55. East African Breweries Ltd | ✓ | ✓ | 40 |
| 56. Kenya Orchards Ltd | × | × | N/A |
| 57. Mumias Sugar Co. Ltd | ✓ | ✓ | 41 |
| 58. Unga Group Ltd. | ✓ | ✓ | 42 |
| 59. Eveready E.A. Ltd | × | × | N/A |
| TELECOMMUNICATIONS AND TECHNOLOGY | | | |
| 60. Safaricom | × | × | N/A |
| GROWTH ENTERPRISE MARKETS SEGMENT | | | |
| 61. Home Africa | × | × | N/A |
| 62. Flame Tree Group Holding Ltd. | × | × | N/A |
| 63. Atlas Development and Support Ltd. | × | × | N/A |
| 64. Kurwitu Ventures | × | × | N/A |

Source: NSE, 2014

APPENDIX III: DATA COLLECTION SHEET

NAME OF FIRM:

| Year | 200 | 2004 | 2005 | 2006 | 200 | 200 | 200 | 201 | 2011 | 201 | 2013 | 2014 |
|--------------------------------------|------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|------------|-------------|-------------|
| Board Size | | | | | | | | | | | | |
| Independent Directors | | | | | | | | | | | | |
| Women in the Board | | | | | | | | | | | | |
| Total Liabilities | | | | | | | | | | | | |
| Sales/Income | | | | | | | | | | | | |
| Total Assets | | | | | | | | | | | | |
| Depreciation | | | | | | | | | | | | |
| Salaries and Wages | | | | | | | | | | | | |
| Finance Cost | | | | | | | | | | | | |
| Profits attributable to Shareholders | | | | | | | | | | | | |
| Taxation Expense | | | | | | | | | | | | |
| Non-current assets | | | | | | | | | | | | |

APPENDIX IV: DATA ON SELECTED VARIABLES

| CODE | YEAR | BSIZ | BIND | BGDIV | FLG | FAGE | TANG | FSIZ | CEE | HCE | SCE | |
|-------------|-------------|-------------|-------------|--------------|------------|-------------|-------------|-------------|------------|------------|------------|-------|
| VAIC | | | | | | | | | | | | |
| 1 | 2003 | 4 | 0.500 | 0.000 | 0.183 | 57 | 0.822 | 0.331 | 0.840 | 1.312 | 0.238 | 2.390 |
| 1 | 2004 | 4 | 0.500 | 0.000 | 0.213 | 58 | 0.681 | 0.373 | 0.732 | 1.301 | 0.232 | 2.265 |
| 1 | 2005 | 5 | 0.600 | 0.000 | 0.250 | 59 | 0.615 | 0.461 | 0.872 | 1.245 | 0.197 | 2.313 |
| 1 | 2006 | 5 | 0.600 | 0.000 | 0.233 | 60 | 0.712 | 0.433 | 0.932 | 1.248 | 0.199 | 2.380 |
| 1 | 2007 | 5 | 0.600 | 0.000 | 0.202 | 61 | 0.669 | 0.452 | 0.752 | 1.124 | 0.111 | 1.987 |
| 1 | 2008 | 5 | 0.600 | 0.000 | 0.257 | 62 | 0.679 | 0.542 | 0.830 | 1.193 | 0.162 | 2.184 |
| 1 | 2009 | 5 | 0.600 | 0.000 | 0.232 | 63 | 0.620 | 0.439 | 0.646 | 1.041 | 0.039 | 1.726 |
| 1 | 2010 | 5 | 0.600 | 0.000 | 0.252 | 64 | 0.604 | 0.495 | 0.683 | 1.080 | 0.074 | 1.837 |
| 1 | 2011 | 5 | 0.600 | 0.000 | 0.250 | 65 | 0.755 | 0.520 | 0.682 | 1.139 | 0.122 | 1.943 |
| 1 | 2012 | 5 | 0.600 | 0.000 | 0.159 | 66 | 0.852 | 0.274 | 0.461 | 1.143 | 0.125 | 1.728 |
| 1 | 2013 | 5 | 0.600 | 0.000 | 0.195 | 67 | 0.905 | 0.136 | 0.558 | 1.342 | 0.255 | 2.154 |
| 1 | 2014 | 5 | 0.600 | 0.000 | 0.192 | 68 | 0.926 | 0.215 | 0.424 | 0.878 | -0.139 | 1.164 |
| 2 | 2003 | 6 | 0.833 | 0.000 | 0.391 | 97 | 0.819 | 0.510 | 0.293 | 2.561 | 0.610 | 3.464 |
| 2 | 2004 | 6 | 0.833 | 0.000 | 0.620 | 98 | 0.911 | 0.700 | 0.353 | 2.813 | 0.644 | 3.810 |
| 2 | 2005 | 7 | 0.857 | 0.000 | 0.449 | 99 | 0.989 | 0.870 | 0.370 | 2.440 | 0.590 | 3.400 |
| 2 | 2006 | 7 | 0.857 | 0.000 | 0.330 | 100 | 0.930 | 0.685 | 0.341 | 2.442 | 0.591 | 3.374 |
| 2 | 2007 | 7 | 0.857 | 0.000 | 0.388 | 101 | 0.865 | 0.617 | 0.300 | 2.374 | 0.579 | 3.253 |
| 2 | 2008 | 7 | 0.857 | 0.000 | 0.411 | 102 | 0.835 | 0.606 | 0.303 | 2.529 | 0.605 | 3.437 |
| 2 | 2009 | 7 | 0.857 | 0.000 | 0.316 | 103 | 0.785 | 0.699 | 0.333 | 2.881 | 0.653 | 3.866 |
| 2 | 2010 | 6 | 0.833 | 0.000 | 0.313 | 104 | 0.753 | 0.657 | 0.318 | 2.428 | 0.588 | 3.335 |
| 2 | 2011 | 6 | 0.833 | 0.000 | 0.278 | 105 | 0.692 | 0.623 | 0.366 | 3.321 | 0.699 | 4.386 |
| 2 | 2012 | 7 | 0.857 | 0.000 | 0.216 | 106 | 0.654 | 0.438 | 0.278 | 2.432 | 0.589 | 3.298 |
| 2 | 2013 | 8 | 0.875 | 0.000 | 0.219 | 107 | 0.685 | 0.372 | 0.176 | 1.807 | 0.447 | 2.430 |
| 2 | 2014 | 8 | 0.875 | 0.000 | 0.226 | 108 | 0.694 | 0.438 | 0.178 | 1.712 | 0.416 | 2.306 |
| 3 | 2003 | 5 | 0.800 | 0.000 | 0.520 | 53 | 0.752 | 1.001 | 0.119 | 1.139 | 0.122 | 1.380 |
| 3 | 2004 | 5 | 0.800 | 0.000 | 0.657 | 54 | 0.761 | 0.865 | 0.158 | 1.333 | 0.250 | 1.740 |

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|---|------|---|-------|-------|-------|----|-------|-------|-------|-------|--------|-------|
| 3 | 2005 | 5 | 0.800 | 0.000 | 0.553 | 55 | 0.838 | 0.789 | 0.199 | 1.670 | 0.401 | 2.271 |
| 3 | 2006 | 5 | 0.800 | 0.000 | 0.566 | 56 | 0.767 | 0.928 | 0.195 | 1.583 | 0.368 | 2.147 |
| 3 | 2007 | 5 | 0.800 | 0.000 | 0.481 | 57 | 0.705 | 0.620 | 0.174 | 1.620 | 0.383 | 2.177 |
| 3 | 2008 | 6 | 0.833 | 0.000 | 0.543 | 58 | 0.943 | 0.749 | 0.184 | 1.590 | 0.371 | 2.146 |
| 3 | 2009 | 9 | 0.556 | 0.000 | 0.454 | 59 | 0.547 | 0.754 | 0.270 | 2.309 | 0.567 | 3.145 |
| 3 | 2010 | 6 | 0.833 | 0.000 | 0.378 | 60 | 0.633 | 0.794 | 0.316 | 2.533 | 0.605 | 3.454 |
| 3 | 2011 | 5 | 0.800 | 0.000 | 0.422 | 61 | 0.617 | 0.717 | 0.178 | 1.707 | 0.414 | 2.300 |
| 3 | 2012 | 5 | 0.800 | 0.000 | 0.382 | 62 | 0.594 | 0.651 | 0.237 | 2.393 | 0.582 | 3.212 |
| 3 | 2013 | 8 | 0.875 | 0.000 | 0.284 | 63 | 0.678 | 0.618 | 0.238 | 1.829 | 0.453 | 2.520 |
| 3 | 2014 | 8 | 0.875 | 0.000 | 0.280 | 64 | 0.675 | 0.542 | 0.114 | 0.982 | -0.018 | 1.078 |
| 4 | 2003 | 5 | 0.800 | 0.000 | 0.391 | 79 | 0.812 | 1.001 | 0.840 | 1.312 | 0.238 | 2.390 |
| 4 | 2004 | 5 | 0.875 | 0.000 | 0.620 | 80 | 0.795 | 0.865 | 0.732 | 1.301 | 0.232 | 2.265 |
| 4 | 2005 | 5 | 0.800 | 0.120 | 0.449 | 81 | 0.811 | 0.789 | 0.872 | 1.245 | 0.197 | 2.313 |
| 4 | 2006 | 5 | 0.800 | 0.120 | 0.330 | 82 | 0.848 | 0.928 | 0.490 | 1.680 | 0.400 | 2.580 |
| 4 | 2007 | 6 | 0.800 | 0.150 | 0.388 | 83 | 0.862 | 0.620 | 0.380 | 1.370 | 0.270 | 2.020 |
| 4 | 2008 | 6 | 0.833 | 0.150 | 0.411 | 84 | 1.024 | 0.215 | 0.530 | 2.050 | 0.510 | 3.100 |
| 4 | 2009 | 6 | 0.556 | 0.200 | 0.316 | 85 | 0.728 | 0.273 | 0.640 | 2.170 | 0.540 | 3.340 |
| 4 | 2010 | 6 | 0.833 | 0.200 | 0.313 | 86 | 0.864 | 0.254 | 0.174 | 1.620 | 0.383 | 2.177 |
| 4 | 2011 | 6 | 0.800 | 0.200 | 0.278 | 87 | 0.869 | 0.282 | 0.184 | 1.590 | 0.371 | 2.146 |
| 4 | 2012 | 6 | 0.800 | 0.200 | 0.216 | 88 | 0.813 | 0.316 | 0.270 | 2.309 | 0.567 | 3.145 |
| 4 | 2013 | 8 | 0.875 | 0.200 | 0.219 | 89 | 0.857 | 0.311 | 0.316 | 2.533 | 0.605 | 3.454 |
| 4 | 2014 | 8 | 0.875 | 0.200 | 0.226 | 90 | 0.917 | 0.185 | 0.178 | 1.707 | 0.414 | 2.300 |
| 5 | 2003 | 4 | 0.750 | 0.000 | 0.400 | 64 | 0.612 | 1.090 | 0.500 | 1.670 | 0.400 | 2.570 |
| 5 | 2004 | 5 | 0.800 | 0.000 | 0.400 | 65 | 0.596 | 1.130 | 0.510 | 1.750 | 0.000 | 2.250 |
| 5 | 2005 | 5 | 0.800 | 0.000 | 0.410 | 66 | 0.597 | 1.000 | 0.530 | 1.800 | 0.440 | 2.770 |
| 5 | 2006 | 5 | 0.800 | 0.000 | 0.390 | 67 | 0.644 | 1.070 | 0.550 | 1.690 | 0.410 | 2.640 |
| 5 | 2007 | 5 | 0.800 | 0.000 | 0.390 | 68 | 0.595 | 1.020 | 0.530 | 1.660 | 0.400 | 2.590 |
| 5 | 2008 | 5 | 0.800 | 0.000 | 0.460 | 69 | 0.515 | 0.800 | 0.450 | 1.720 | 0.420 | 2.590 |

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|---|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 5 | 2009 | 5 | 0.800 | 0.000 | 0.310 | 70 | 0.645 | 1.030 | 0.490 | 1.680 | 0.400 | 2.580 |
| 5 | 2010 | 5 | 0.800 | 0.000 | 0.420 | 71 | 0.656 | 0.850 | 0.380 | 1.370 | 0.270 | 2.020 |
| 5 | 2011 | 5 | 0.800 | 0.000 | 0.360 | 72 | 0.609 | 0.990 | 0.530 | 2.050 | 0.510 | 3.100 |
| 5 | 2012 | 5 | 0.800 | 0.000 | 0.280 | 73 | 0.636 | 1.120 | 0.640 | 2.170 | 0.540 | 3.340 |
| 5 | 2013 | 5 | 0.800 | 0.000 | 0.220 | 74 | 0.560 | 0.870 | 0.450 | 1.890 | 0.470 | 2.810 |
| 5 | 2014 | 5 | 0.800 | 0.000 | 0.250 | 75 | 0.676 | 0.980 | 0.670 | 2.180 | 0.540 | 3.390 |
| 6 | 2003 | 8 | 0.625 | 0.125 | 0.226 | 51 | 0.812 | 0.366 | 0.105 | 3.032 | 0.670 | 3.807 |
| 6 | 2004 | 8 | 0.750 | 0.125 | 0.213 | 52 | 0.795 | 0.310 | 0.198 | 2.915 | 0.657 | 3.770 |
| 6 | 2005 | 8 | 0.750 | 0.125 | 0.229 | 53 | 0.811 | 0.337 | 0.126 | 1.555 | 0.357 | 2.038 |
| 6 | 2006 | 8 | 0.750 | 0.125 | 0.233 | 54 | 0.848 | 0.331 | 0.218 | 1.966 | 0.491 | 2.675 |
| 6 | 2007 | 8 | 0.800 | 0.125 | 0.250 | 55 | 0.862 | 0.346 | 0.194 | 1.884 | 0.469 | 2.547 |
| 6 | 2008 | 11 | 0.727 | 0.182 | 0.306 | 56 | 1.024 | 0.215 | 0.257 | 3.406 | 0.706 | 4.370 |
| 6 | 2009 | 10 | 0.800 | 0.200 | 0.292 | 57 | 0.728 | 0.273 | 0.219 | 2.856 | 0.650 | 3.724 |
| 6 | 2010 | 10 | 0.900 | 0.100 | 0.284 | 58 | 0.864 | 0.254 | 0.269 | 3.105 | 0.678 | 4.051 |
| 6 | 2011 | 10 | 0.800 | 0.100 | 0.285 | 59 | 0.869 | 0.282 | 0.181 | 1.956 | 0.489 | 2.625 |
| 6 | 2012 | 9 | 0.889 | 0.111 | 0.280 | 60 | 0.813 | 0.316 | 0.140 | 1.459 | 0.315 | 1.914 |
| 6 | 2013 | 9 | 0.778 | 0.111 | 0.295 | 61 | 0.857 | 0.311 | 0.112 | 1.322 | 0.244 | 1.678 |
| 6 | 2014 | 8 | 0.800 | 0.125 | 0.170 | 62 | 0.917 | 0.185 | 0.031 | 2.276 | 0.561 | 2.868 |
| 7 | 2003 | 4 | 0.750 | 0.000 | 0.566 | 89 | 0.862 | 0.542 | 0.218 | 1.966 | 0.491 | 2.675 |
| 7 | 2004 | 4 | 0.750 | 0.000 | 0.481 | 90 | 1.024 | 0.439 | 0.194 | 1.884 | 0.469 | 2.547 |
| 7 | 2005 | 4 | 0.750 | 0.000 | 0.543 | 91 | 0.728 | 0.495 | 0.257 | 3.406 | 0.706 | 4.370 |
| 7 | 2006 | 4 | 0.750 | 0.000 | 0.454 | 92 | 0.609 | 0.520 | 0.219 | 2.856 | 0.650 | 3.724 |
| 7 | 2007 | 5 | 0.800 | 0.000 | 0.378 | 93 | 0.636 | 0.789 | 0.640 | 2.170 | 0.540 | 3.340 |
| 7 | 2008 | 5 | 0.800 | 0.000 | 0.422 | 94 | 0.560 | 0.928 | 0.450 | 1.890 | 0.470 | 2.810 |
| 7 | 2009 | 5 | 0.800 | 0.000 | 0.388 | 95 | 0.811 | 0.620 | 0.670 | 2.180 | 0.540 | 3.390 |
| 7 | 2010 | 5 | 0.800 | 0.000 | 0.411 | 96 | 0.848 | 0.215 | 0.105 | 3.032 | 0.670 | 3.807 |
| 7 | 2011 | 5 | 0.800 | 0.000 | 0.316 | 97 | 0.862 | 0.273 | 0.198 | 2.915 | 0.657 | 3.770 |
| 7 | 2012 | 5 | 0.800 | 0.000 | 0.313 | 98 | 1.024 | 0.870 | 0.140 | 1.459 | 0.315 | 1.914 |

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|----|------|----|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 7 | 2013 | 5 | 0.800 | 0.000 | 0.278 | 99 | 0.848 | 0.904 | 0.112 | 1.322 | 0.244 | 1.678 |
| 7 | 2014 | 5 | 0.800 | 0.000 | 0.216 | 100 | 0.862 | 0.915 | 0.031 | 2.276 | 0.561 | 2.868 |
| 8 | 2003 | 6 | 0.830 | 0.000 | 0.439 | 64 | 0.206 | 1.175 | 0.218 | 1.966 | 0.491 | 2.675 |
| 8 | 2004 | 6 | 0.833 | 0.000 | 0.502 | 65 | 0.220 | 0.941 | 0.334 | 4.222 | 0.763 | 5.320 |
| 8 | 2005 | 7 | 0.714 | 0.000 | 0.480 | 66 | 0.232 | 0.915 | 0.335 | 4.512 | 0.778 | 5.625 |
| 8 | 2006 | 7 | 0.714 | 0.000 | 0.488 | 67 | 0.199 | 0.870 | 0.223 | 2.600 | 0.615 | 3.438 |
| 8 | 2007 | 7 | 0.714 | 0.000 | 0.566 | 68 | 0.377 | 0.904 | 0.223 | 3.146 | 0.682 | 4.051 |
| 8 | 2008 | 9 | 0.778 | 0.000 | 0.590 | 69 | 0.335 | 1.090 | 0.221 | 3.010 | 0.668 | 3.898 |
| 8 | 2009 | 8 | 0.750 | 0.000 | 0.593 | 70 | 0.318 | 1.353 | 0.223 | 2.811 | 0.644 | 3.678 |
| 8 | 2010 | 8 | 0.750 | 0.000 | 0.598 | 71 | 0.308 | 1.235 | 0.206 | 2.635 | 0.620 | 3.461 |
| 8 | 2011 | 7 | 0.714 | 0.000 | 0.655 | 72 | 0.373 | 1.094 | 0.202 | 2.957 | 0.662 | 3.821 |
| 8 | 2012 | 7 | 0.714 | 0.000 | 0.624 | 73 | 0.405 | 1.001 | 0.186 | 2.657 | 0.624 | 3.466 |
| 8 | 2013 | 7 | 0.714 | 0.000 | 0.637 | 74 | 0.393 | 1.022 | 0.180 | 2.712 | 0.631 | 3.524 |
| 8 | 2014 | 7 | 0.714 | 0.000 | 0.653 | 75 | 0.384 | 1.018 | 0.177 | 2.334 | 0.571 | 3.082 |
| 9 | 2003 | 9 | 0.890 | 0.330 | 0.881 | 56 | 0.037 | 0.070 | 0.140 | 3.510 | 0.720 | 4.370 |
| 9 | 2004 | 9 | 0.890 | 0.330 | 0.882 | 57 | 0.033 | 0.080 | 0.120 | 2.500 | 0.600 | 3.220 |
| 9 | 2005 | 9 | 0.890 | 0.330 | 0.871 | 58 | 0.030 | 0.070 | 0.120 | 2.600 | 0.610 | 3.330 |
| 9 | 2006 | 9 | 0.890 | 0.220 | 0.850 | 59 | 0.033 | 0.060 | 0.100 | 3.740 | 0.730 | 4.570 |
| 9 | 2007 | 9 | 0.890 | 0.220 | 0.861 | 60 | 0.621 | 0.879 | 0.233 | 3.911 | 0.744 | 4.887 |
| 9 | 2008 | 10 | 0.900 | 0.100 | 0.744 | 61 | 0.001 | 0.120 | 0.150 | 1.990 | 0.510 | 2.650 |
| 9 | 2009 | 8 | 0.875 | 0.000 | 0.852 | 62 | 0.001 | 0.110 | 0.150 | 2.150 | 0.530 | 2.830 |
| 9 | 2010 | 8 | 0.875 | 0.000 | 0.875 | 63 | 0.001 | 0.050 | 0.160 | 1.720 | 0.420 | 2.290 |
| 9 | 2011 | 8 | 0.875 | 0.000 | 0.896 | 64 | 0.000 | 0.060 | 0.180 | 2.260 | 0.560 | 2.990 |
| 9 | 2012 | 9 | 0.889 | 0.111 | 0.926 | 65 | 0.035 | 0.099 | 0.055 | 1.424 | 0.298 | 1.777 |
| 9 | 2013 | 8 | 0.880 | 0.130 | 0.850 | 66 | 0.024 | 0.092 | 0.049 | 1.684 | 0.406 | 2.139 |
| 9 | 2014 | 8 | 0.880 | 0.130 | 0.800 | 67 | 0.030 | 0.094 | 0.044 | 2.098 | 0.523 | 2.666 |
| 10 | 2003 | 5 | 0.800 | 0.000 | 0.415 | 34 | 0.294 | 0.944 | 0.157 | 1.301 | 0.231 | 1.688 |
| 10 | 2004 | 5 | 0.800 | 0.000 | 0.425 | 35 | 0.276 | 0.988 | 0.175 | 1.520 | 0.342 | 2.038 |

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|----|------|----|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 10 | 2005 | 5 | 0.800 | 0.000 | 0.439 | 36 | 0.243 | 0.968 | 0.167 | 1.541 | 0.351 | 2.059 |
| 10 | 2006 | 5 | 0.800 | 0.000 | 0.501 | 37 | 0.256 | 1.090 | 0.174 | 1.447 | 0.309 | 1.930 |
| 10 | 2007 | 6 | 0.833 | 0.000 | 0.386 | 38 | 0.224 | 1.115 | 0.222 | 1.727 | 0.421 | 2.370 |
| 10 | 2008 | 6 | 0.833 | 0.000 | 0.373 | 39 | 0.197 | 1.170 | 0.234 | 1.649 | 0.394 | 2.277 |
| 10 | 2009 | 6 | 0.833 | 0.000 | 0.339 | 40 | 0.191 | 1.121 | 0.241 | 1.581 | 0.367 | 2.189 |
| 10 | 2010 | 6 | 0.833 | 0.000 | 0.402 | 41 | 0.188 | 1.603 | 0.315 | 1.687 | 0.407 | 2.409 |
| 10 | 2011 | 7 | 0.857 | 0.000 | 0.308 | 42 | 0.145 | 1.304 | 0.288 | 1.679 | 0.405 | 2.372 |
| 10 | 2012 | 7 | 0.857 | 0.000 | 0.280 | 43 | 0.136 | 1.307 | 0.310 | 1.873 | 0.466 | 2.649 |
| 10 | 2013 | 6 | 0.833 | 0.000 | 0.270 | 44 | 0.119 | 1.099 | 0.329 | 2.001 | 0.500 | 2.831 |
| 10 | 2014 | 6 | 0.833 | 0.000 | 0.342 | 45 | 0.137 | 0.979 | 0.362 | 1.972 | 0.493 | 2.827 |
| 11 | 2003 | 9 | 0.778 | 0.111 | 0.740 | 89 | 0.014 | 0.091 | 0.089 | 2.121 | 0.529 | 2.739 |
| 11 | 2004 | 9 | 0.778 | 0.111 | 0.709 | 90 | 0.014 | 0.093 | 0.087 | 2.023 | 0.506 | 2.616 |
| 11 | 2005 | 9 | 0.778 | 0.111 | 0.693 | 91 | 0.017 | 0.104 | 0.089 | 2.170 | 0.539 | 2.798 |
| 11 | 2006 | 8 | 0.750 | 0.250 | 0.867 | 92 | 0.017 | 0.125 | 0.092 | 2.538 | 0.606 | 3.235 |
| 11 | 2007 | 10 | 0.800 | 0.300 | 0.889 | 93 | 0.018 | 0.120 | 0.101 | 2.770 | 0.639 | 3.510 |
| 11 | 2008 | 10 | 0.800 | 0.300 | 0.878 | 94 | 0.024 | 0.140 | 0.104 | 2.712 | 0.631 | 3.447 |
| 11 | 2009 | 11 | 0.636 | 0.273 | 0.853 | 95 | 0.036 | 0.142 | 0.116 | 2.669 | 0.625 | 3.410 |
| 11 | 2010 | 11 | 0.636 | 0.273 | 0.818 | 96 | 0.019 | 0.099 | 0.141 | 3.401 | 0.706 | 4.248 |
| 11 | 2011 | 10 | 0.700 | 0.300 | 0.832 | 97 | 0.018 | 0.106 | 0.134 | 3.005 | 0.667 | 3.806 |
| 11 | 2012 | 11 | 0.727 | 0.273 | 0.840 | 98 | 0.014 | 0.114 | 0.137 | 3.189 | 0.686 | 4.013 |
| 11 | 2013 | 11 | 0.727 | 0.364 | 0.843 | 99 | 0.013 | 0.103 | 0.112 | 2.814 | 0.645 | 3.571 |
| 11 | 2014 | 11 | 0.727 | 0.455 | 0.831 | 100 | 0.013 | 0.102 | 0.111 | 3.062 | 0.673 | 3.846 |
| 12 | 2003 | 9 | 0.778 | 0.125 | 0.736 | 14 | 0.035 | 0.109 | 0.089 | 2.170 | 0.539 | 2.798 |
| 12 | 2004 | 9 | 0.778 | 0.125 | 0.855 | 15 | 0.024 | 0.124 | 0.092 | 2.538 | 0.606 | 3.235 |
| 12 | 2005 | 9 | 0.778 | 0.125 | 0.852 | 16 | 0.030 | 0.144 | 0.101 | 2.770 | 0.639 | 3.510 |
| 12 | 2006 | 10 | 0.800 | 0.125 | 0.875 | 17 | 0.021 | 0.159 | 0.310 | 1.873 | 0.466 | 2.649 |
| 12 | 2007 | 10 | 0.800 | 0.125 | 0.896 | 18 | 0.019 | 0.167 | 0.329 | 2.001 | 0.500 | 2.831 |
| 12 | 2008 | 9 | 0.778 | 0.182 | 0.869 | 19 | 0.016 | 0.186 | 0.362 | 1.972 | 0.493 | 2.827 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 12 | 2009 | 10 | 0.800 | 0.200 | 0.857 | 20 | 0.016 | 0.167 | 0.089 | 2.121 | 0.529 | 2.739 |
| 12 | 2010 | 10 | 0.700 | 0.100 | 0.858 | 21 | 0.017 | 0.162 | 0.087 | 2.023 | 0.506 | 2.616 |
| 12 | 2011 | 12 | 0.750 | 0.100 | 0.867 | 22 | 0.017 | 0.128 | 0.039 | 2.642 | 0.621 | 3.302 |
| 12 | 2012 | 13 | 0.769 | 0.111 | 0.857 | 23 | 0.017 | 0.094 | 0.040 | 1.943 | 0.485 | 2.468 |
| 12 | 2013 | 12 | 0.750 | 0.111 | 0.855 | 24 | 0.018 | 0.093 | 0.049 | 2.721 | 0.632 | 3.402 |
| 12 | 2014 | 12 | 0.750 | 0.125 | 0.844 | 25 | 0.018 | 0.144 | 0.046 | 2.389 | 0.581 | 3.016 |
| 12 | 2003 | 8 | 0.625 | 0.125 | 0.881 | 24 | 0.024 | 0.070 | 0.872 | 1.245 | 0.197 | 2.313 |
| 13 | 2004 | 8 | 0.750 | 0.125 | 0.882 | 25 | 0.030 | 0.080 | 0.932 | 1.248 | 0.199 | 2.380 |
| 13 | 2005 | 8 | 0.750 | 0.125 | 0.871 | 26 | 0.021 | 0.070 | 0.752 | 1.124 | 0.111 | 1.987 |
| 13 | 2006 | 8 | 0.750 | 0.125 | 0.850 | 27 | 0.017 | 0.060 | 0.830 | 1.193 | 0.162 | 2.184 |
| 13 | 2007 | 8 | 0.750 | 0.125 | 0.861 | 28 | 0.017 | 0.879 | 0.646 | 1.041 | 0.039 | 1.726 |
| 13 | 2008 | 11 | 0.727 | 0.182 | 0.744 | 29 | 0.017 | 0.120 | 0.683 | 1.080 | 0.074 | 1.837 |
| 13 | 2009 | 10 | 0.800 | 0.200 | 0.736 | 30 | 0.017 | 0.110 | 0.682 | 1.139 | 0.122 | 1.943 |
| 13 | 2010 | 10 | 0.900 | 0.100 | 0.855 | 31 | 0.021 | 0.050 | 0.461 | 1.143 | 0.125 | 1.728 |
| 13 | 2011 | 10 | 0.800 | 0.100 | 0.852 | 32 | 0.019 | 0.060 | 0.558 | 1.342 | 0.255 | 2.154 |
| 13 | 2012 | 9 | 0.889 | 0.111 | 0.875 | 33 | 0.016 | 0.099 | 0.087 | 2.023 | 0.506 | 2.616 |
| 13 | 2013 | 9 | 0.778 | 0.111 | 0.896 | 34 | 0.037 | 0.092 | 0.039 | 2.642 | 0.621 | 3.302 |
| 13 | 2014 | 8 | 0.727 | 0.125 | 0.926 | 35 | 0.035 | 0.094 | 0.040 | 1.943 | 0.485 | 2.468 |
| 13 | 2003 | 7 | 0.857 | 0.286 | 0.881 | 38 | 0.037 | 0.130 | 0.055 | 1.316 | 0.240 | 1.611 |
| 14 | 2004 | 7 | 0.857 | 0.143 | 0.882 | 39 | 0.036 | 0.122 | 0.056 | 1.358 | 0.263 | 1.677 |
| 14 | 2005 | 7 | 0.857 | 0.286 | 0.871 | 40 | 0.031 | 0.103 | 0.054 | 1.398 | 0.285 | 1.737 |
| 14 | 2006 | 7 | 0.857 | 0.286 | 0.850 | 41 | 0.037 | 0.107 | 0.061 | 1.592 | 0.372 | 2.025 |
| 14 | 2007 | 9 | 0.889 | 0.333 | 0.861 | 42 | 0.035 | 0.099 | 0.055 | 1.424 | 0.298 | 1.777 |
| 14 | 2008 | 9 | 0.889 | 0.222 | 0.744 | 43 | 0.024 | 0.092 | 0.049 | 1.684 | 0.406 | 2.139 |
| 14 | 2009 | 9 | 0.889 | 0.111 | 0.736 | 44 | 0.030 | 0.094 | 0.044 | 2.098 | 0.523 | 2.666 |
| 14 | 2010 | 10 | 0.900 | 0.100 | 0.855 | 45 | 0.021 | 0.085 | 0.039 | 2.642 | 0.621 | 3.302 |
| 14 | 2011 | 8 | 0.875 | 0.000 | 0.852 | 46 | 0.022 | 0.109 | 0.040 | 1.943 | 0.485 | 2.468 |
| 14 | 2012 | 8 | 0.875 | 0.000 | 0.875 | 47 | 0.017 | 0.124 | 0.049 | 2.721 | 0.632 | 3.402 |

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|----|------|----|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 14 | 2013 | 8 | 0.875 | 0.000 | 0.896 | 48 | 0.017 | 0.144 | 0.046 | 2.389 | 0.581 | 3.016 |
| 14 | 2014 | 9 | 0.889 | 0.111 | 0.926 | 49 | 0.017 | 0.159 | 0.047 | 2.452 | 0.592 | 3.091 |
| 14 | 2003 | 10 | 0.700 | 0.100 | 0.521 | 44 | 0.026 | 0.167 | 0.199 | 3.705 | 0.730 | 4.635 |
| 15 | 2004 | 10 | 0.700 | 0.100 | 0.715 | 45 | 0.024 | 0.186 | 0.183 | 3.540 | 0.718 | 4.440 |
| 15 | 2005 | 10 | 0.700 | 0.100 | 0.867 | 46 | 0.021 | 0.167 | 0.139 | 3.204 | 0.688 | 4.030 |
| 15 | 2006 | 9 | 0.667 | 0.222 | 0.884 | 47 | 0.019 | 0.162 | 0.129 | 3.284 | 0.695 | 4.108 |
| 15 | 2007 | 11 | 0.727 | 0.091 | 0.849 | 48 | 0.016 | 0.128 | 0.130 | 3.616 | 0.723 | 4.470 |
| 15 | 2008 | 11 | 0.727 | 0.091 | 0.869 | 49 | 0.016 | 0.094 | 0.124 | 3.241 | 0.691 | 4.057 |
| 15 | 2009 | 11 | 0.727 | 0.091 | 0.857 | 50 | 0.017 | 0.093 | 0.115 | 3.114 | 0.679 | 3.908 |
| 15 | 2010 | 11 | 0.727 | 0.091 | 0.858 | 51 | 0.013 | 0.084 | 0.106 | 3.309 | 0.698 | 4.112 |
| 15 | 2011 | 12 | 0.750 | 0.083 | 0.867 | 52 | 0.012 | 0.086 | 0.103 | 3.711 | 0.731 | 4.544 |
| 15 | 2012 | 13 | 0.769 | 0.077 | 0.857 | 53 | 0.009 | 0.106 | 0.104 | 4.522 | 0.779 | 5.404 |
| 15 | 2013 | 13 | 0.769 | 0.154 | 0.855 | 54 | 0.009 | 0.096 | 0.089 | 4.495 | 0.778 | 5.361 |
| 15 | 2014 | 13 | 0.769 | 0.154 | 0.844 | 55 | 0.011 | 0.094 | 0.084 | 4.728 | 0.788 | 5.600 |
| 16 | 2003 | 9 | 0.556 | 0.222 | 0.845 | 92 | 0.006 | 0.100 | 0.064 | 3.998 | 0.750 | 4.812 |
| 16 | 2004 | 10 | 0.500 | 0.200 | 0.841 | 93 | 0.006 | 0.092 | 0.057 | 3.950 | 0.747 | 4.753 |
| 16 | 2005 | 11 | 0.545 | 0.182 | 0.868 | 94 | 0.007 | 0.103 | 0.088 | 3.713 | 0.731 | 4.531 |
| 16 | 2006 | 10 | 0.600 | 0.200 | 0.875 | 95 | 0.006 | 0.098 | 0.093 | 3.258 | 0.693 | 4.044 |
| 16 | 2007 | 10 | 0.600 | 0.200 | 0.880 | 96 | 0.006 | 0.105 | 0.101 | 3.510 | 0.715 | 4.326 |
| 16 | 2008 | 10 | 0.500 | 2.300 | 0.884 | 97 | 0.005 | 0.102 | 0.096 | 3.172 | 0.685 | 3.953 |
| 16 | 2009 | 10 | 0.500 | 0.300 | 0.888 | 98 | 0.004 | 0.099 | 0.096 | 4.181 | 0.761 | 5.038 |
| 16 | 2010 | 10 | 0.500 | 0.300 | 0.858 | 99 | 0.007 | 0.097 | 0.099 | 4.684 | 0.787 | 5.570 |
| 16 | 2011 | 10 | 0.500 | 0.300 | 0.874 | 100 | 0.015 | 0.097 | 0.101 | 3.835 | 0.739 | 4.675 |
| 16 | 2012 | 9 | 0.556 | 0.333 | 0.843 | 101 | 0.015 | 0.106 | 0.119 | 4.660 | 0.785 | 5.565 |
| 16 | 2013 | 9 | 0.556 | 0.333 | 0.836 | 102 | 0.016 | 0.106 | 0.121 | 4.358 | 0.771 | 5.249 |
| 16 | 2014 | 9 | 0.556 | 0.333 | 0.817 | 103 | 0.014 | 0.115 | 0.115 | 4.430 | 0.774 | 5.319 |
| 17 | 2003 | 12 | 0.750 | 0.091 | 0.850 | 39 | 0.017 | 0.186 | 0.103 | 3.711 | 0.731 | 4.544 |
| 17 | 2004 | 12 | 0.750 | 0.091 | 0.861 | 40 | 0.017 | 0.167 | 0.104 | 4.522 | 0.779 | 5.404 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 17 | 2005 | 13 | 0.750 | 0.091 | 0.744 | 41 | 0.021 | 0.162 | 0.103 | 3.711 | 0.731 | 4.544 |
| 17 | 2006 | 14 | 0.727 | 0.091 | 0.736 | 42 | 0.019 | 0.128 | 0.104 | 4.522 | 0.779 | 5.404 |
| 17 | 2007 | 14 | 0.800 | 0.083 | 0.855 | 43 | 0.016 | 0.105 | 0.100 | 2.540 | 0.610 | 3.250 |
| 17 | 2008 | 14 | 0.900 | 0.077 | 0.852 | 44 | 0.040 | 0.102 | 0.130 | 2.690 | 0.630 | 3.440 |
| 17 | 2009 | 13 | 0.800 | 0.154 | 0.875 | 45 | 0.042 | 0.099 | 0.090 | 2.220 | 0.550 | 2.860 |
| 17 | 2010 | 13 | 0.889 | 0.154 | 0.896 | 46 | 0.037 | 0.097 | 0.110 | 2.750 | 0.640 | 3.490 |
| 17 | 2011 | 13 | 0.714 | 0.222 | 0.926 | 47 | 0.030 | 0.097 | 0.100 | 2.540 | 0.610 | 3.250 |
| 17 | 2012 | 14 | 0.714 | 0.200 | 0.521 | 48 | 0.033 | 0.128 | 0.130 | 2.690 | 0.630 | 3.440 |
| 17 | 2013 | 14 | 0.778 | 0.182 | 0.715 | 49 | 0.016 | 0.105 | 0.090 | 2.220 | 0.550 | 2.860 |
| 17 | 2014 | 14 | 0.750 | 0.200 | 0.867 | 50 | 0.040 | 0.102 | 0.104 | 4.522 | 0.779 | 5.404 |
| 18 | 2003 | 13 | 0.830 | 0.167 | 0.857 | 80 | 0.019 | 0.183 | 0.099 | 4.684 | 0.787 | 5.570 |
| 18 | 2004 | 13 | 0.833 | 0.167 | 0.855 | 81 | 0.016 | 0.139 | 0.101 | 3.835 | 0.739 | 4.675 |
| 18 | 2005 | 10 | 0.714 | 0.167 | 0.844 | 82 | 0.016 | 1.115 | 0.119 | 4.660 | 0.785 | 5.565 |
| 18 | 2006 | 11 | 0.714 | 0.167 | 0.845 | 83 | 0.017 | 1.170 | 0.106 | 3.309 | 0.698 | 4.112 |
| 18 | 2007 | 11 | 0.714 | 0.167 | 0.841 | 84 | 0.040 | 1.121 | 0.103 | 3.711 | 0.731 | 4.544 |
| 18 | 2008 | 11 | 0.778 | 0.214 | 0.868 | 85 | 0.040 | 1.603 | 0.104 | 4.522 | 0.779 | 5.404 |
| 18 | 2009 | 11 | 0.750 | 0.200 | 0.875 | 86 | 0.040 | 0.950 | 0.089 | 4.495 | 0.778 | 5.361 |
| 18 | 2010 | 11 | 0.750 | 0.200 | 0.880 | 87 | 0.042 | 0.829 | 0.138 | 3.615 | 0.723 | 4.476 |
| 18 | 2011 | 11 | 0.714 | 0.286 | 0.884 | 88 | 0.037 | 0.921 | 0.135 | 4.082 | 0.755 | 4.971 |
| 18 | 2012 | 14 | 0.714 | 0.286 | 0.888 | 89 | 0.030 | 0.886 | 0.125 | 4.963 | 0.798 | 5.886 |
| 18 | 2013 | 14 | 0.714 | 0.385 | 0.858 | 90 | 0.033 | 1.254 | 0.126 | 4.191 | 0.761 | 5.078 |
| 18 | 2014 | 14 | 0.714 | 0.385 | 0.874 | 91 | 0.036 | 1.351 | 0.115 | 3.687 | 0.729 | 4.531 |
| 19 | 2003 | 8 | 0.880 | 0.130 | 0.850 | 39 | 0.037 | 0.070 | 0.140 | 3.510 | 0.720 | 4.370 |
| 19 | 2004 | 8 | 0.880 | 0.130 | 0.800 | 40 | 0.033 | 0.080 | 0.120 | 2.500 | 0.600 | 3.220 |
| 19 | 2005 | 9 | 0.780 | 0.110 | 0.860 | 41 | 0.030 | 0.070 | 0.120 | 2.600 | 0.610 | 3.330 |
| 19 | 2006 | 9 | 0.780 | 0.110 | 0.910 | 42 | 0.033 | 0.060 | 0.100 | 3.740 | 0.730 | 4.570 |
| 19 | 2007 | 9 | 0.780 | 0.110 | 0.850 | 43 | 0.036 | 0.060 | 0.120 | 2.370 | 0.580 | 3.060 |
| 19 | 2008 | 12 | 0.670 | 0.080 | 0.850 | 44 | 0.037 | 0.060 | 0.110 | 2.380 | 0.580 | 3.080 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 19 | 2009 | 12 | 0.580 | 0.080 | 0.850 | 45 | 0.040 | 0.050 | 0.100 | 3.030 | 0.670 | 3.810 |
| 19 | 2010 | 12 | 0.580 | 0.080 | 0.830 | 46 | 0.040 | 0.040 | 0.110 | 2.750 | 0.640 | 3.490 |
| 19 | 2011 | 12 | 0.670 | 0.080 | 0.850 | 47 | 0.040 | 0.040 | 0.100 | 2.540 | 0.610 | 3.250 |
| 19 | 2012 | 13 | 0.690 | 0.150 | 0.840 | 48 | 0.040 | 0.020 | 0.130 | 2.690 | 0.630 | 3.440 |
| 19 | 2013 | 12 | 0.670 | 0.170 | 0.870 | 49 | 0.042 | 0.020 | 0.090 | 2.220 | 0.550 | 2.860 |
| 19 | 2014 | 10 | 0.700 | 0.200 | 0.900 | 50 | 0.037 | 0.020 | 0.070 | 2.410 | 0.590 | 3.070 |
| 20 | 2003 | 8 | 0.875 | 0.000 | 0.852 | 39 | 0.685 | 0.787 | 0.234 | 2.619 | 0.618 | 3.472 |
| 20 | 2004 | 8 | 0.875 | 0.000 | 0.875 | 40 | 0.663 | 0.809 | 0.210 | 2.429 | 0.588 | 3.228 |
| 20 | 2005 | 8 | 0.875 | 0.000 | 0.896 | 41 | 0.674 | 0.682 | 0.196 | 2.830 | 0.647 | 3.673 |
| 20 | 2006 | 9 | 0.889 | 0.111 | 0.926 | 42 | 0.694 | 0.944 | 0.157 | 1.301 | 0.231 | 1.688 |
| 20 | 2007 | 10 | 0.700 | 0.100 | 0.521 | 43 | 0.576 | 0.988 | 0.175 | 1.520 | 0.342 | 2.038 |
| 20 | 2008 | 10 | 0.700 | 0.100 | 0.715 | 44 | 0.543 | 0.968 | 0.167 | 1.541 | 0.351 | 2.059 |
| 20 | 2009 | 10 | 0.700 | 0.100 | 0.867 | 45 | 0.656 | 1.090 | 0.174 | 1.447 | 0.309 | 1.930 |
| 20 | 2010 | 9 | 0.667 | 0.222 | 0.884 | 46 | 0.624 | 1.115 | 0.222 | 1.727 | 0.421 | 2.370 |
| 20 | 2011 | 11 | 0.727 | 0.091 | 0.849 | 47 | 0.597 | 1.170 | 0.234 | 1.649 | 0.394 | 2.277 |
| 20 | 2012 | 11 | 0.727 | 0.091 | 0.869 | 48 | 0.744 | 0.360 | 0.138 | 3.615 | 0.723 | 4.476 |
| 20 | 2013 | 9 | 0.780 | 0.110 | 0.910 | 49 | 0.817 | 0.398 | 0.135 | 4.082 | 0.755 | 4.971 |
| 20 | 2014 | 9 | 0.780 | 0.110 | 0.850 | 50 | 0.656 | 1.100 | 0.174 | 1.447 | 0.309 | 1.930 |
| 21 | 2003 | 13 | 0.750 | 0.214 | 0.855 | 44 | 0.585 | 0.850 | 0.333 | 2.881 | 0.653 | 3.866 |
| 21 | 2004 | 12 | 0.750 | 0.200 | 0.844 | 45 | 0.563 | 0.829 | 0.318 | 2.428 | 0.588 | 3.335 |
| 21 | 2005 | 13 | 0.750 | 0.200 | 0.845 | 46 | 0.574 | 0.931 | 0.366 | 3.321 | 0.699 | 4.386 |
| 21 | 2006 | 15 | 0.727 | 0.286 | 0.841 | 47 | 0.594 | 0.896 | 0.278 | 2.432 | 0.589 | 3.298 |
| 21 | 2007 | 14 | 0.800 | 0.286 | 0.868 | 48 | 0.576 | 1.214 | 0.176 | 1.807 | 0.447 | 2.430 |
| 21 | 2008 | 14 | 0.900 | 0.385 | 0.875 | 49 | 0.643 | 1.151 | 0.178 | 1.712 | 0.416 | 2.306 |
| 21 | 2009 | 13 | 0.800 | 0.385 | 0.880 | 50 | 0.656 | 1.034 | 0.119 | 1.139 | 0.122 | 1.380 |
| 21 | 2010 | 13 | 0.889 | 0.125 | 0.884 | 51 | 0.674 | 0.943 | 0.158 | 1.333 | 0.250 | 1.740 |
| 21 | 2011 | 13 | 0.714 | 0.125 | 0.888 | 52 | 0.697 | 1.071 | 0.199 | 1.670 | 0.401 | 2.271 |
| 21 | 2012 | 14 | 0.714 | 0.111 | 0.858 | 53 | 0.754 | 0.871 | 0.195 | 1.583 | 0.368 | 2.147 |

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|----|------|----|-------|-------|-------|-----|-------|-------|-------|-------|--------|-------|
| 21 | 2013 | 14 | 0.778 | 0.125 | 0.874 | 54 | 0.797 | 0.889 | 0.174 | 1.620 | 0.383 | 2.177 |
| 21 | 2014 | 14 | 0.750 | 0.222 | 0.850 | 55 | 0.856 | 0.879 | 0.184 | 1.590 | 0.371 | 2.146 |
| 22 | 2003 | 11 | 0.878 | 0.130 | 0.727 | 102 | 0.763 | 0.921 | 0.270 | 2.309 | 0.567 | 3.145 |
| 22 | 2004 | 12 | 0.780 | 0.130 | 0.800 | 103 | 0.774 | 0.886 | 0.830 | 1.193 | 0.162 | 2.184 |
| 22 | 2005 | 11 | 0.780 | 0.110 | 0.900 | 104 | 0.794 | 1.254 | 0.646 | 1.041 | 0.039 | 1.726 |
| 22 | 2006 | 11 | 0.780 | 0.110 | 0.800 | 105 | 0.676 | 1.351 | 0.683 | 1.080 | 0.074 | 1.837 |
| 22 | 2007 | 11 | 0.780 | 0.110 | 0.889 | 106 | 0.643 | 0.934 | 0.682 | 1.139 | 0.122 | 1.943 |
| 22 | 2008 | 12 | 0.670 | 0.080 | 0.714 | 107 | 0.656 | 0.843 | 0.461 | 1.143 | 0.125 | 1.728 |
| 22 | 2009 | 12 | 0.580 | 0.080 | 0.714 | 108 | 0.624 | 1.071 | 0.558 | 1.342 | 0.255 | 2.154 |
| 22 | 2010 | 12 | 0.580 | 0.080 | 0.778 | 109 | 0.697 | 0.871 | 0.424 | 0.878 | -0.139 | 1.164 |
| 22 | 2011 | 12 | 0.670 | 0.080 | 0.750 | 110 | 0.754 | 0.789 | 0.293 | 2.561 | 0.610 | 3.464 |
| 22 | 2012 | 13 | 0.690 | 0.150 | 0.830 | 111 | 0.717 | 0.879 | 0.353 | 2.813 | 0.644 | 3.810 |
| 22 | 2013 | 12 | 0.670 | 0.170 | 0.833 | 112 | 0.756 | 0.165 | 0.370 | 2.440 | 0.590 | 3.400 |
| 22 | 2014 | 10 | 0.700 | 0.200 | 0.876 | 113 | 0.760 | 0.177 | 0.341 | 2.442 | 0.591 | 3.374 |
| 23 | 2003 | 8 | 0.750 | 0.125 | 0.326 | 33 | 0.494 | 0.175 | 0.640 | 2.170 | 0.540 | 3.340 |
| 23 | 2004 | 8 | 0.750 | 0.125 | 0.360 | 34 | 0.476 | 0.187 | 0.450 | 1.890 | 0.470 | 2.810 |
| 23 | 2005 | 9 | 0.778 | 0.111 | 0.465 | 35 | 0.543 | 0.217 | 0.670 | 2.180 | 0.540 | 3.390 |
| 23 | 2006 | 8 | 0.750 | 0.125 | 0.428 | 36 | 0.556 | 0.140 | 0.105 | 3.032 | 0.670 | 3.807 |
| 23 | 2007 | 9 | 0.778 | 0.222 | 0.434 | 37 | 0.524 | 0.230 | 0.198 | 2.915 | 0.657 | 3.770 |
| 23 | 2008 | 9 | 0.778 | 0.111 | 0.410 | 38 | 0.597 | 0.252 | 0.140 | 1.459 | 0.315 | 1.914 |
| 23 | 2009 | 9 | 0.778 | 0.111 | 0.434 | 39 | 0.491 | 0.189 | 0.112 | 1.322 | 0.244 | 1.678 |
| 23 | 2010 | 9 | 0.778 | 0.111 | 0.387 | 40 | 0.488 | 0.169 | 0.031 | 2.276 | 0.561 | 2.868 |
| 23 | 2011 | 7 | 0.714 | 0.286 | 0.343 | 41 | 0.545 | 0.213 | 0.218 | 1.966 | 0.491 | 2.675 |
| 23 | 2012 | 9 | 0.778 | 0.333 | 0.347 | 42 | 0.536 | 0.223 | 0.334 | 4.222 | 0.763 | 5.320 |
| 23 | 2013 | 9 | 0.778 | 0.333 | 0.351 | 43 | 0.519 | 0.199 | 0.335 | 4.512 | 0.778 | 5.625 |
| 23 | 2014 | 9 | 0.778 | 0.333 | 0.434 | 44 | 0.537 | 0.219 | 0.223 | 2.600 | 0.615 | 3.438 |
| 25 | 2003 | 9 | 0.778 | 0.000 | 0.388 | 29 | 0.685 | 0.787 | 0.234 | 2.619 | 0.618 | 3.472 |
| 25 | 2004 | 9 | 0.778 | 0.000 | 0.487 | 30 | 0.663 | 0.809 | 0.210 | 2.429 | 0.588 | 3.228 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 25 | 2005 | 9 | 0.778 | 0.000 | 0.626 | 31 | 0.674 | 0.682 | 0.196 | 2.830 | 0.647 | 3.673 |
| 25 | 2006 | 10 | 0.800 | 0.000 | 0.677 | 32 | 0.752 | 0.612 | 0.191 | 2.834 | 0.647 | 3.673 |
| 25 | 2007 | 10 | 0.800 | 0.000 | 0.607 | 33 | 0.737 | 0.862 | 0.316 | 3.335 | 0.700 | 4.351 |
| 25 | 2008 | 9 | 0.778 | 0.000 | 0.665 | 34 | 0.703 | 0.727 | 0.258 | 3.498 | 0.714 | 4.470 |
| 25 | 2009 | 10 | 0.800 | 0.000 | 0.660 | 35 | 0.723 | 0.424 | 0.150 | 3.162 | 0.684 | 3.996 |
| 25 | 2010 | 10 | 0.700 | 0.000 | 0.720 | 36 | 0.744 | 0.360 | 0.138 | 3.615 | 0.723 | 4.476 |
| 25 | 2011 | 12 | 0.750 | 0.000 | 0.703 | 37 | 0.817 | 0.398 | 0.135 | 4.082 | 0.755 | 4.971 |
| 25 | 2012 | 13 | 0.769 | 0.077 | 0.736 | 38 | 0.706 | 0.423 | 0.125 | 3.963 | 0.798 | 4.886 |
| 25 | 2013 | 12 | 0.750 | 0.000 | 0.723 | 39 | 0.971 | 0.477 | 0.126 | 3.191 | 0.761 | 4.078 |
| 25 | 2014 | 12 | 0.750 | 0.000 | 0.745 | 40 | 0.778 | 0.372 | 0.115 | 3.687 | 0.729 | 4.531 |
| 26 | 2003 | 10 | 0.700 | 0.200 | 0.307 | 76 | 0.755 | 0.950 | 0.193 | 2.120 | 0.528 | 2.841 |
| 26 | 2004 | 11 | 0.727 | 0.182 | 0.292 | 77 | 0.759 | 0.829 | 0.316 | 3.344 | 0.701 | 4.361 |
| 26 | 2005 | 11 | 0.727 | 0.182 | 0.248 | 78 | 0.706 | 0.921 | 0.337 | 3.751 | 0.733 | 4.821 |
| 26 | 2006 | 11 | 0.727 | 0.182 | 0.263 | 79 | 0.695 | 0.886 | 0.342 | 3.741 | 0.733 | 4.815 |
| 26 | 2007 | 12 | 0.750 | 0.167 | 0.267 | 80 | 0.659 | 1.254 | 0.453 | 3.366 | 0.771 | 4.590 |
| 26 | 2008 | 12 | 0.750 | 0.167 | 0.329 | 81 | 0.618 | 1.351 | 0.390 | 3.595 | 0.722 | 4.707 |
| 26 | 2009 | 14 | 0.714 | 0.143 | 0.154 | 82 | 0.602 | 0.934 | 0.390 | 4.586 | 0.821 | 4.796 |
| 26 | 2010 | 14 | 0.714 | 0.143 | 0.224 | 83 | 0.614 | 0.843 | 0.324 | 4.061 | 0.802 | 5.187 |
| 26 | 2011 | 10 | 0.600 | 0.200 | 0.152 | 84 | 0.601 | 1.071 | 0.370 | 5.425 | 0.816 | 6.610 |
| 26 | 2012 | 12 | 0.667 | 0.250 | 0.163 | 85 | 0.618 | 0.871 | 0.246 | 4.488 | 0.777 | 5.511 |
| 26 | 2013 | 13 | 0.692 | 0.231 | 0.139 | 86 | 0.627 | 0.789 | 0.245 | 4.481 | 0.777 | 5.502 |
| 26 | 2014 | 14 | 0.643 | 0.214 | 0.165 | 87 | 0.621 | 0.879 | 0.233 | 3.911 | 0.744 | 4.887 |
| 27 | 2003 | 6 | 0.833 | 0.166 | 0.434 | 28 | 0.848 | 0.461 | 0.056 | 1.358 | 0.263 | 1.677 |
| 27 | 2004 | 6 | 0.833 | 0.166 | 0.410 | 29 | 0.862 | 0.433 | 0.054 | 1.398 | 0.285 | 1.737 |
| 27 | 2005 | 7 | 0.857 | 0.142 | 0.434 | 30 | 1.024 | 0.452 | 0.061 | 1.592 | 0.372 | 2.025 |
| 27 | 2006 | 7 | 0.857 | 0.142 | 0.387 | 31 | 0.728 | 0.542 | 0.055 | 1.424 | 0.298 | 1.777 |
| 27 | 2007 | 7 | 0.857 | 0.142 | 0.343 | 32 | 0.864 | 0.439 | 0.049 | 1.684 | 0.406 | 2.139 |
| 27 | 2008 | 7 | 0.857 | 0.142 | 0.347 | 33 | 0.869 | 0.495 | 0.683 | 1.080 | 0.074 | 1.837 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 27 | 2009 | 7 | 0.857 | 0.142 | 0.351 | 34 | 0.813 | 0.520 | 0.682 | 1.139 | 0.122 | 1.943 |
| 27 | 2010 | 6 | 0.833 | 0.166 | 0.300 | 35 | 0.857 | 0.542 | 0.461 | 1.143 | 0.125 | 1.728 |
| 27 | 2011 | 6 | 0.833 | 0.166 | 0.361 | 36 | 0.917 | 0.439 | 0.558 | 1.342 | 0.255 | 2.154 |
| 27 | 2012 | 7 | 0.857 | 0.000 | 0.426 | 37 | 0.862 | 0.495 | 0.872 | 1.245 | 0.197 | 2.313 |
| 27 | 2013 | 8 | 0.875 | 0.125 | 0.448 | 38 | 1.024 | 0.520 | 0.932 | 1.248 | 0.199 | 2.380 |
| 27 | 2014 | 8 | 0.875 | 0.125 | 0.426 | 39 | 0.728 | 0.789 | 0.752 | 1.124 | 0.111 | 1.987 |
| 28 | 2003 | 8 | 0.880 | 0.130 | 0.736 | 78 | 0.747 | 0.120 | 0.040 | 1.943 | 0.485 | 2.468 |
| 28 | 2004 | 8 | 0.880 | 0.130 | 0.855 | 79 | 0.713 | 0.110 | 0.049 | 2.721 | 0.632 | 3.402 |
| 28 | 2005 | 9 | 0.780 | 0.110 | 0.852 | 80 | 0.753 | 0.050 | 0.046 | 2.389 | 0.581 | 3.016 |
| 28 | 2006 | 9 | 0.780 | 0.110 | 0.875 | 81 | 0.744 | 0.060 | 0.872 | 1.245 | 0.197 | 2.313 |
| 28 | 2007 | 9 | 0.780 | 0.110 | 0.896 | 82 | 0.817 | 0.100 | 0.932 | 1.248 | 0.199 | 2.380 |
| 28 | 2008 | 12 | 0.670 | 0.080 | 0.869 | 83 | 0.706 | 0.060 | 0.683 | 1.080 | 0.074 | 1.837 |
| 28 | 2009 | 12 | 0.580 | 0.080 | 0.857 | 84 | 0.971 | 0.130 | 0.682 | 1.139 | 0.122 | 1.943 |
| 28 | 2010 | 12 | 0.580 | 0.080 | 0.858 | 85 | 0.778 | 0.180 | 0.461 | 1.143 | 0.125 | 1.728 |
| 28 | 2011 | 12 | 0.670 | 0.080 | 0.867 | 86 | 0.755 | 0.110 | 0.119 | 1.139 | 0.122 | 1.380 |
| 28 | 2012 | 13 | 0.690 | 0.150 | 0.857 | 87 | 0.759 | 0.210 | 0.158 | 1.333 | 0.250 | 1.740 |
| 28 | 2013 | 12 | 0.670 | 0.170 | 0.855 | 88 | 0.706 | 0.160 | 0.160 | 1.470 | 0.320 | 1.940 |
| 28 | 2014 | 10 | 0.700 | 0.200 | 0.844 | 89 | 0.695 | 0.290 | 0.056 | 1.358 | 0.263 | 1.677 |
| 29 | 2003 | 6 | 0.833 | 0.000 | 0.388 | 44 | 0.574 | 0.097 | 0.150 | 1.990 | 0.510 | 2.650 |
| 29 | 2004 | 6 | 0.833 | 0.000 | 0.411 | 45 | 0.594 | 0.106 | 0.150 | 2.150 | 0.530 | 2.830 |
| 29 | 2005 | 7 | 0.857 | 0.000 | 0.316 | 46 | 0.576 | 0.106 | 0.160 | 1.720 | 0.420 | 2.290 |
| 29 | 2006 | 8 | 0.875 | 0.000 | 0.313 | 47 | 0.643 | 0.115 | 0.180 | 2.260 | 0.560 | 2.990 |
| 29 | 2007 | 8 | 0.875 | 0.000 | 0.278 | 48 | 0.656 | 0.186 | 0.200 | 2.000 | 0.670 | 2.860 |
| 29 | 2008 | 8 | 0.880 | 0.000 | 0.216 | 49 | 0.674 | 0.167 | 0.683 | 1.080 | 0.074 | 1.837 |
| 29 | 2009 | 8 | 0.880 | 0.000 | 0.439 | 50 | 0.614 | 0.162 | 0.682 | 1.139 | 0.122 | 1.943 |
| 29 | 2010 | 9 | 0.780 | 0.000 | 0.502 | 51 | 0.601 | 0.130 | 0.461 | 1.143 | 0.125 | 1.728 |
| 29 | 2011 | 9 | 0.780 | 0.000 | 0.480 | 52 | 0.618 | 0.180 | 0.119 | 1.139 | 0.122 | 1.380 |
| 29 | 2012 | 9 | 0.780 | 0.000 | 0.488 | 53 | 0.627 | 0.110 | 0.056 | 1.358 | 0.263 | 1.677 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 29 | 2013 | 6 | 0.833 | 0.000 | 0.566 | 54 | 0.621 | 0.210 | 0.054 | 1.398 | 0.285 | 1.737 |
| 29 | 2014 | 6 | 0.833 | 0.000 | 0.590 | 55 | 0.848 | 0.162 | 0.061 | 1.592 | 0.372 | 2.025 |
| 31 | 2003 | 4 | 0.750 | 0.200 | 0.521 | 11 | 0.656 | 0.418 | 0.341 | 2.442 | 0.591 | 3.374 |
| 31 | 2004 | 5 | 0.800 | 0.200 | 0.715 | 12 | 0.609 | 0.425 | 0.640 | 2.170 | 0.540 | 3.340 |
| 31 | 2005 | 5 | 0.800 | 0.200 | 0.867 | 13 | 0.636 | 0.243 | 0.450 | 1.890 | 0.470 | 2.810 |
| 31 | 2006 | 5 | 0.800 | 0.200 | 0.884 | 14 | 0.560 | 0.173 | 0.670 | 2.180 | 0.540 | 3.390 |
| 31 | 2007 | 5 | 0.800 | 0.200 | 0.849 | 15 | 0.676 | 0.234 | 0.174 | 1.620 | 0.383 | 2.177 |
| 31 | 2008 | 5 | 0.800 | 0.200 | 0.824 | 16 | 0.728 | 0.186 | 0.184 | 1.590 | 0.371 | 2.146 |
| 31 | 2009 | 5 | 0.800 | 0.200 | 0.824 | 17 | 0.747 | 0.167 | 0.270 | 2.309 | 0.567 | 3.145 |
| 31 | 2010 | 5 | 0.800 | 0.400 | 0.817 | 18 | 0.713 | 0.162 | 0.830 | 1.193 | 0.162 | 2.184 |
| 31 | 2011 | 5 | 0.800 | 0.400 | 0.782 | 19 | 0.753 | 0.130 | 0.646 | 1.041 | 0.039 | 1.726 |
| 31 | 2012 | 5 | 0.800 | 0.400 | 0.736 | 20 | 0.744 | 0.180 | 0.683 | 1.080 | 0.074 | 1.837 |
| 31 | 2013 | 5 | 0.800 | 0.400 | 0.855 | 21 | 0.813 | 0.140 | 0.056 | 1.358 | 0.263 | 1.677 |
| 31 | 2014 | 5 | 0.800 | 0.400 | 0.852 | 22 | 0.857 | 0.230 | 0.054 | 1.398 | 0.285 | 1.737 |
| 32 | 2003 | 9 | 0.778 | 0.000 | 0.896 | 76 | 0.004 | 1.254 | 0.932 | 1.248 | 0.199 | 2.380 |
| 32 | 2004 | 9 | 0.778 | 0.111 | 0.926 | 77 | 0.007 | 1.351 | 0.752 | 1.124 | 0.111 | 1.987 |
| 32 | 2005 | 10 | 0.800 | 0.100 | 0.521 | 78 | 0.015 | 0.934 | 0.830 | 1.193 | 0.162 | 2.184 |
| 32 | 2006 | 9 | 0.778 | 0.000 | 0.715 | 79 | 0.015 | 0.843 | 0.646 | 1.041 | 0.039 | 1.726 |
| 32 | 2007 | 9 | 0.778 | 0.111 | 0.867 | 80 | 0.016 | 1.071 | 0.683 | 1.080 | 0.074 | 1.837 |
| 32 | 2008 | 10 | 0.800 | 0.000 | 0.884 | 81 | 0.014 | 0.871 | 0.682 | 1.139 | 0.122 | 1.943 |
| 32 | 2009 | 10 | 0.800 | 0.100 | 0.849 | 82 | 0.017 | 0.789 | 0.461 | 1.143 | 0.125 | 1.728 |
| 32 | 2010 | 12 | 0.833 | 0.167 | 0.869 | 83 | 0.017 | 0.879 | 0.530 | 1.660 | 0.400 | 2.590 |
| 32 | 2011 | 12 | 0.833 | 0.167 | 0.910 | 84 | 0.021 | 0.461 | 0.450 | 1.720 | 0.420 | 2.590 |
| 32 | 2012 | 12 | 0.833 | 0.167 | 0.850 | 85 | 0.019 | 0.433 | 0.490 | 1.680 | 0.400 | 2.580 |
| 32 | 2013 | 12 | 0.833 | 0.167 | 0.855 | 86 | 0.016 | 0.452 | 0.380 | 1.370 | 0.270 | 2.020 |
| 32 | 2014 | 12 | 0.833 | 0.167 | 0.844 | 87 | 0.040 | 0.542 | 0.530 | 2.050 | 0.510 | 3.100 |
| 33 | 2003 | 11 | 0.818 | 0.091 | 0.733 | 66 | 0.005 | 0.165 | 0.077 | 2.106 | 0.525 | 2.708 |
| 33 | 2004 | 11 | 0.818 | 0.091 | 0.759 | 67 | 0.007 | 0.177 | 0.075 | 2.147 | 0.534 | 2.756 |

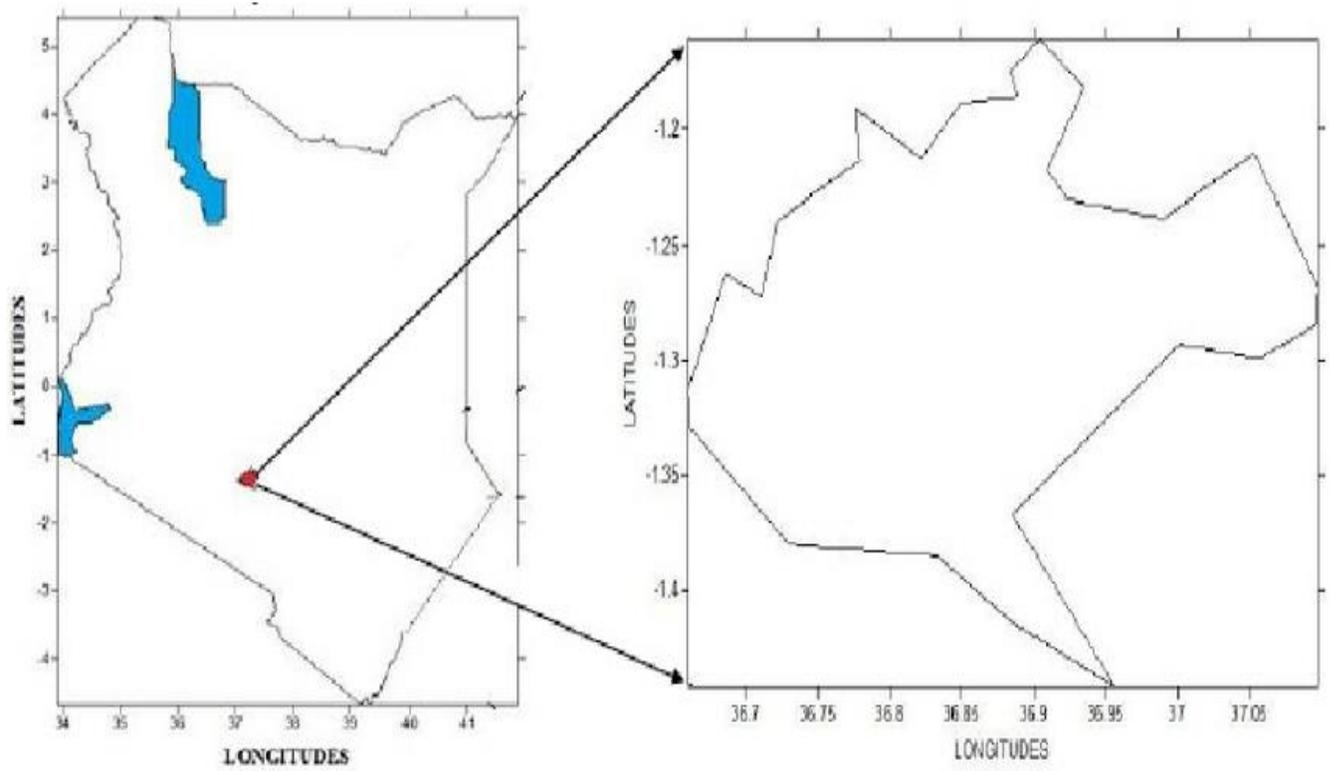
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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 33 | 2005 | 10 | 0.800 | 0.100 | 0.773 | 68 | 0.006 | 0.217 | 0.078 | 2.245 | 0.555 | 2.878 |
| 33 | 2006 | 12 | 0.833 | 0.083 | 0.765 | 69 | 0.005 | 0.140 | 0.072 | 2.690 | 0.628 | 3.391 |
| 33 | 2007 | 9 | 0.778 | 0.111 | 0.785 | 70 | 0.003 | 0.230 | 0.075 | 2.966 | 0.663 | 3.704 |
| 33 | 2008 | 9 | 0.778 | 0.111 | 0.841 | 71 | 0.002 | 0.152 | 0.075 | 2.831 | 0.647 | 3.552 |
| 33 | 2009 | 9 | 0.778 | 0.111 | 0.847 | 72 | 0.002 | 0.199 | 0.072 | 2.976 | 0.664 | 3.712 |
| 33 | 2010 | 9 | 0.778 | 0.111 | 0.824 | 73 | 0.002 | 0.169 | 0.090 | 4.014 | 0.751 | 4.855 |
| 33 | 2011 | 9 | 0.778 | 0.111 | 0.824 | 74 | 0.002 | 0.193 | 0.092 | 3.836 | 0.739 | 4.668 |
| 33 | 2012 | 9 | 0.778 | 0.111 | 0.817 | 75 | 0.003 | 0.198 | 0.083 | 2.567 | 0.720 | 3.370 |
| 33 | 2013 | 8 | 0.875 | 0.000 | 0.782 | 76 | 0.003 | 0.176 | 0.079 | 3.115 | 0.679 | 3.873 |
| 33 | 2014 | 11 | 0.818 | 0.091 | 0.779 | 77 | 0.002 | 0.219 | 0.072 | 3.169 | 0.760 | 4.001 |
| 34 | 2003 | 8 | 0.625 | 0.125 | 0.861 | 57 | 0.040 | 0.186 | 0.646 | 1.041 | 0.039 | 1.726 |
| 34 | 2004 | 8 | 0.750 | 0.125 | 0.744 | 58 | 0.040 | 0.167 | 0.683 | 1.080 | 0.074 | 1.837 |
| 34 | 2005 | 8 | 0.750 | 0.125 | 0.736 | 59 | 0.040 | 0.162 | 0.682 | 1.139 | 0.122 | 1.943 |
| 34 | 2006 | 8 | 0.750 | 0.125 | 0.855 | 60 | 0.042 | 0.130 | 0.461 | 1.143 | 0.125 | 1.728 |
| 34 | 2007 | 8 | 0.800 | 0.125 | 0.852 | 61 | 0.037 | 0.180 | 0.558 | 1.342 | 0.255 | 2.154 |
| 34 | 2008 | 11 | 0.727 | 0.182 | 0.875 | 62 | 0.030 | 0.162 | 0.061 | 1.592 | 0.372 | 2.025 |
| 34 | 2009 | 10 | 0.800 | 0.200 | 0.896 | 63 | 0.033 | 0.418 | 0.341 | 2.442 | 0.591 | 3.374 |
| 34 | 2010 | 10 | 0.900 | 0.100 | 0.926 | 64 | 0.036 | 0.425 | 0.640 | 2.170 | 0.540 | 3.340 |
| 34 | 2011 | 10 | 0.800 | 0.100 | 0.881 | 65 | 0.037 | 0.243 | 0.450 | 1.890 | 0.470 | 2.810 |
| 34 | 2012 | 9 | 0.889 | 0.111 | 0.882 | 66 | 0.033 | 0.173 | 0.670 | 2.180 | 0.540 | 3.390 |
| 34 | 2013 | 9 | 0.778 | 0.111 | 0.871 | 67 | 0.030 | 0.234 | 0.174 | 1.620 | 0.383 | 2.177 |
| 34 | 2014 | 8 | 0.800 | 0.125 | 0.850 | 68 | 0.033 | 0.130 | 0.300 | 1.880 | 0.470 | 2.650 |
| 35 | 2003 | 9 | 0.890 | 0.330 | 0.080 | 36 | 0.001 | 0.120 | 0.150 | 1.990 | 0.510 | 2.650 |
| 35 | 2004 | 9 | 0.890 | 0.330 | 0.080 | 37 | 0.001 | 0.110 | 0.150 | 2.150 | 0.530 | 2.830 |
| 35 | 2005 | 9 | 0.890 | 0.330 | 0.070 | 38 | 0.001 | 0.050 | 0.160 | 1.720 | 0.420 | 2.290 |
| 35 | 2006 | 9 | 0.890 | 0.220 | 0.040 | 39 | 0.000 | 0.060 | 0.180 | 2.260 | 0.560 | 2.990 |
| 35 | 2007 | 9 | 0.890 | 0.220 | 0.010 | 40 | 0.000 | 0.100 | 0.200 | 2.000 | 0.670 | 2.860 |
| 35 | 2008 | 10 | 0.900 | 0.200 | 0.040 | 41 | 0.001 | 0.060 | 0.160 | 1.470 | 0.320 | 1.940 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 35 | 2009 | 9 | 0.890 | 0.220 | 0.050 | 42 | 0.001 | 0.130 | 0.300 | 1.880 | 0.470 | 2.650 |
| 35 | 2010 | 9 | 0.890 | 0.110 | 0.220 | 43 | 0.002 | 0.180 | 0.260 | 1.730 | 0.420 | 2.410 |
| 35 | 2011 | 9 | 0.890 | 0.110 | 0.130 | 44 | 0.002 | 0.110 | 0.340 | 3.290 | 0.700 | 4.320 |
| 35 | 2012 | 9 | 0.890 | 0.220 | 0.280 | 45 | 0.002 | 0.210 | 0.390 | 2.180 | 0.540 | 3.120 |
| 35 | 2013 | 9 | 0.890 | 0.220 | 0.320 | 46 | 0.002 | 0.160 | 0.340 | 3.780 | 0.740 | 4.850 |
| 35 | 2014 | 9 | 0.890 | 0.220 | 0.230 | 47 | 0.002 | 0.290 | 0.610 | 1.560 | 0.360 | 2.520 |
| 36 | 2003 | 8 | 0.750 | 0.125 | 0.519 | 34 | 0.209 | 0.418 | 0.069 | 2.232 | 0.552 | 2.853 |
| 36 | 2004 | 8 | 0.750 | 0.000 | 0.259 | 35 | 0.176 | 0.425 | 0.061 | 2.211 | 0.548 | 2.819 |
| 36 | 2005 | 8 | 0.750 | 0.000 | 0.327 | 36 | 0.228 | 0.243 | 0.063 | 2.060 | 0.515 | 2.638 |
| 36 | 2006 | 9 | 0.778 | 0.111 | 0.344 | 37 | 0.214 | 0.173 | 0.060 | 2.160 | 0.537 | 2.756 |
| 36 | 2007 | 9 | 0.778 | 0.111 | 0.382 | 38 | 0.212 | 0.234 | 0.086 | 3.069 | 0.674 | 3.829 |
| 36 | 2008 | 9 | 0.778 | 0.000 | 0.326 | 39 | 0.287 | 0.300 | 0.084 | 2.541 | 0.606 | 3.232 |
| 36 | 2009 | 9 | 0.778 | 0.111 | 0.360 | 40 | 0.330 | 0.323 | 0.081 | 2.361 | 0.577 | 3.019 |
| 36 | 2010 | 10 | 0.800 | 0.100 | 0.465 | 41 | 0.307 | 0.380 | 0.103 | 2.502 | 0.600 | 3.205 |
| 36 | 2011 | 9 | 0.778 | 0.000 | 0.428 | 42 | 0.320 | 0.415 | 0.104 | 2.124 | 0.529 | 2.758 |
| 36 | 2012 | 9 | 0.778 | 0.111 | 0.434 | 43 | 0.305 | 0.435 | 0.112 | 1.912 | 0.477 | 2.500 |
| 36 | 2013 | 10 | 0.800 | 0.000 | 0.410 | 44 | 0.339 | 0.464 | 0.843 | 1.095 | 0.087 | 2.025 |
| 36 | 2014 | 10 | 0.800 | 0.100 | 0.434 | 45 | 0.266 | 0.396 | 0.138 | 2.315 | 0.568 | 3.020 |
| 38 | 2003 | 8 | 0.625 | 0.125 | 0.226 | 38 | 1.024 | 0.452 | 0.049 | 2.721 | 0.632 | 3.402 |
| 38 | 2004 | 8 | 0.750 | 0.125 | 0.213 | 39 | 0.728 | 0.542 | 0.046 | 2.389 | 0.581 | 3.016 |
| 38 | 2005 | 8 | 0.750 | 0.125 | 0.229 | 40 | 0.864 | 0.439 | 0.047 | 2.452 | 0.592 | 3.091 |
| 38 | 2006 | 8 | 0.750 | 0.125 | 0.233 | 41 | 0.869 | 0.495 | 0.199 | 3.705 | 0.730 | 4.635 |
| 38 | 2007 | 8 | 0.800 | 0.125 | 0.250 | 42 | 0.813 | 0.520 | 0.183 | 3.540 | 0.718 | 4.440 |
| 38 | 2008 | 11 | 0.727 | 0.182 | 0.306 | 43 | 0.857 | 0.542 | 0.139 | 3.204 | 0.688 | 4.030 |
| 38 | 2009 | 10 | 0.800 | 0.200 | 0.292 | 44 | 0.917 | 0.439 | 0.129 | 3.284 | 0.695 | 4.108 |
| 38 | 2010 | 10 | 0.900 | 0.100 | 0.284 | 45 | 0.862 | 0.495 | 0.130 | 3.616 | 0.723 | 4.470 |
| 38 | 2011 | 10 | 0.800 | 0.100 | 0.285 | 46 | 1.024 | 0.520 | 0.124 | 3.241 | 0.691 | 4.057 |
| 38 | 2012 | 9 | 0.889 | 0.111 | 0.280 | 47 | 0.747 | 0.120 | 0.115 | 3.114 | 0.679 | 3.908 |

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|----|------|----|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 38 | 2013 | 9 | 0.778 | 0.111 | 0.295 | 48 | 0.713 | 0.110 | 0.106 | 3.309 | 0.698 | 4.112 |
| 38 | 2014 | 8 | 0.800 | 0.125 | 0.170 | 49 | 0.753 | 0.050 | 0.103 | 3.711 | 0.731 | 4.544 |
| 40 | 2003 | 13 | 0.830 | 0.167 | 0.926 | 81 | 0.334 | 0.080 | 0.120 | 2.500 | 0.600 | 3.220 |
| 40 | 2004 | 13 | 0.833 | 0.167 | 0.881 | 82 | 0.416 | 0.070 | 0.120 | 2.600 | 0.610 | 3.330 |
| 40 | 2005 | 10 | 0.714 | 0.167 | 0.882 | 83 | 0.311 | 0.060 | 0.100 | 3.740 | 0.730 | 4.570 |
| 40 | 2006 | 11 | 0.714 | 0.167 | 0.871 | 84 | 0.325 | 0.879 | 0.233 | 3.911 | 0.744 | 4.887 |
| 40 | 2007 | 11 | 0.714 | 0.167 | 0.850 | 85 | 0.284 | 0.120 | 0.150 | 1.990 | 0.510 | 2.650 |
| 40 | 2008 | 11 | 0.778 | 0.214 | 0.867 | 86 | 0.275 | 0.110 | 0.150 | 2.150 | 0.530 | 2.830 |
| 40 | 2009 | 11 | 0.750 | 0.200 | 0.884 | 87 | 0.273 | 0.050 | 0.160 | 1.720 | 0.420 | 2.290 |
| 40 | 2010 | 11 | 0.750 | 0.200 | 0.849 | 88 | 0.363 | 0.060 | 0.180 | 2.260 | 0.560 | 2.990 |
| 40 | 2011 | 11 | 0.714 | 0.286 | 0.869 | 89 | 0.368 | 0.099 | 0.055 | 1.424 | 0.298 | 1.777 |
| 40 | 2012 | 14 | 0.714 | 0.286 | 0.910 | 90 | 0.308 | 0.092 | 0.049 | 1.684 | 0.406 | 2.139 |
| 40 | 2013 | 14 | 0.714 | 0.385 | 0.850 | 91 | 0.334 | 0.094 | 0.044 | 2.098 | 0.523 | 2.666 |
| 40 | 2014 | 14 | 0.714 | 0.385 | 0.855 | 92 | 0.416 | 0.944 | 0.157 | 1.301 | 0.231 | 1.688 |
| 41 | 2003 | 12 | 0.833 | 0.167 | 0.387 | 32 | 0.420 | 0.988 | 0.175 | 1.520 | 0.342 | 2.038 |
| 41 | 2004 | 12 | 0.833 | 0.167 | 0.343 | 33 | 0.409 | 0.842 | 0.296 | 2.169 | 0.539 | 3.004 |
| 41 | 2005 | 12 | 0.833 | 0.167 | 0.347 | 34 | 0.363 | 0.860 | 0.265 | 2.392 | 0.582 | 3.239 |
| 41 | 2006 | 12 | 0.833 | 0.167 | 0.351 | 35 | 0.368 | 0.982 | 0.313 | 2.533 | 0.605 | 3.451 |
| 41 | 2007 | 12 | 0.833 | 0.167 | 0.300 | 36 | 0.308 | 0.871 | 0.310 | 2.539 | 0.606 | 3.455 |
| 41 | 2008 | 14 | 0.857 | 0.214 | 0.361 | 37 | 0.676 | 0.833 | 0.228 | 2.249 | 0.555 | 3.033 |
| 41 | 2009 | 15 | 0.867 | 0.200 | 0.426 | 38 | 0.707 | 0.894 | 0.174 | 1.950 | 0.487 | 2.611 |
| 41 | 2010 | 15 | 0.867 | 0.200 | 0.448 | 39 | 0.654 | 0.681 | 0.200 | 2.400 | 0.583 | 3.183 |
| 41 | 2011 | 14 | 0.857 | 0.286 | 0.426 | 40 | 0.736 | 0.567 | 0.146 | 1.982 | 0.496 | 2.624 |
| 41 | 2012 | 14 | 0.857 | 0.286 | 0.511 | 41 | 0.740 | 0.440 | 0.150 | 1.884 | 0.469 | 2.503 |
| 41 | 2013 | 13 | 0.846 | 0.385 | 0.528 | 42 | 0.707 | 0.434 | 0.124 | 1.747 | 0.428 | 2.299 |
| 41 | 2014 | 13 | 0.846 | 0.385 | 0.606 | 43 | 0.825 | 0.503 | 0.157 | 1.578 | 0.366 | 2.101 |
| 42 | 2003 | 8 | 0.750 | 0.125 | 0.282 | 76 | 0.282 | 1.933 | 0.146 | 2.117 | 0.528 | 2.791 |
| 42 | 2004 | 8 | 0.750 | 0.125 | 0.416 | 77 | 0.312 | 1.955 | 0.178 | 1.773 | 0.436 | 2.386 |

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|----|------|---|-------|-------|-------|----|-------|-------|-------|-------|-------|-------|
| 42 | 2005 | 9 | 0.778 | 0.111 | 0.351 | 78 | 0.471 | 1.965 | 0.195 | 1.957 | 0.489 | 2.641 |
| 42 | 2006 | 8 | 0.750 | 0.125 | 0.281 | 79 | 0.334 | 1.600 | 0.141 | 1.779 | 0.438 | 2.358 |
| 42 | 2007 | 9 | 0.778 | 0.222 | 0.349 | 80 | 0.416 | 2.148 | 0.207 | 2.333 | 0.571 | 3.112 |
| 42 | 2008 | 9 | 0.778 | 0.111 | 0.375 | 81 | 0.311 | 2.092 | 0.146 | 2.065 | 0.516 | 2.726 |
| 42 | 2009 | 9 | 0.778 | 0.111 | 0.265 | 82 | 0.325 | 2.276 | 0.182 | 1.995 | 0.499 | 2.675 |
| 42 | 2010 | 9 | 0.778 | 0.111 | 0.344 | 83 | 0.284 | 2.315 | 0.195 | 2.401 | 0.584 | 3.180 |
| 42 | 2011 | 7 | 0.714 | 0.286 | 0.378 | 84 | 0.275 | 2.488 | 0.196 | 2.427 | 0.588 | 3.211 |
| 42 | 2012 | 9 | 0.778 | 0.333 | 0.458 | 85 | 0.273 | 1.895 | 0.162 | 2.421 | 0.587 | 3.169 |
| 42 | 2013 | 9 | 0.778 | 0.333 | 0.416 | 86 | 0.317 | 2.214 | 0.201 | 2.179 | 0.541 | 2.921 |
| 42 | 2014 | 9 | 0.778 | 0.333 | 0.382 | 87 | 0.371 | 2.159 | 0.232 | 2.609 | 0.617 | 3.458 |

APPENDIX V: MAP OF STUDY AREA (NAIROBI)



Source: Google Maps, 2016