

**EFFECTS OF BOARD STRUCTURE AND MARKET SEGMENT
ON CAPITAL STRUCTURE OF FIRMS LISTED IN THE
NAIROBI SECURITIES EXCHANGE**

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DECLARATION

I declare that this is my original work and has not been presented for examination or for an award in any University or institution of learning.

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DEDICATION

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ABSTRACT

This study's objective was to determine the effect of board structure and market segment on the capital structure of firms listed in the Nairobi Securities Exchange. Capital structure is the mix of debt to equity firms use to finance their operations, while board structure refers to the board's internal organisation and influences strategies used by firms. One of the strategies firms consider in maximising shareholder wealth is the firm's optimal capital structure. In Kenya, the NSE has classified firms listed on the exchange into four equity market segments; Main Investment Market Segment (MIMS), Alternative Investment Market Segment (AIMS), Growth and Enterprise Market Segment (GEMS) and Real Estate Investment Trusts (REITs). The study showed that board structure and market segment affect firms' capital structure of the listed firms at the NSE in the MIMS and AIMS market segments. The GEMS and REITs market segments were dropped as they did not meet the necessary number of observations threshold. Using secondary data, a multiple linear regression model was used to determine the relationship for the listed firms from 2015 to 2019. The results showed that board structure and market segments could explain a 76.78% variance in capital structure. An F-test was carried out for the regression model, and the null hypothesis was not rejected as the test statistic did not exceed the critical F-value set at the 5% level. Further, the study showed that an increase in the board size and women and independent directors' representation was shown to reduce leverage. A reduction in leverage reduces the perceived risk in the firm and improves capital structure in both the MIMS and AIMS market segments. The study results showed that firms in the AIMS market segment lag behind those in the MIMS market segment regarding the number of board members, women and independent directors representation. As the results showed, these factors would reduce the firms' leverage. Firms in the AIMS market segment need to relook at their board structures to enhance their capital structure. However, firms trying to determine their optimal capital structures need to consider other factors such as profitability, firm size, growth, non-debt tax shields, earnings volatility and tangibility. The study has shown that, in conjunction with board structure, they affect the capital structure for firms in both the MIMS and AIMS market segments and should not be ignored.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIMS	Alternative Investment Market Segment
CEO	Chief Executive Officer
CGQ	Corporate Governance Quotient
CMA	Capital Markets Authority
EBITDA	Earnings Before Interest Tax and Depreciation or Amortisation
GEMS	Growth and Enterprise Market Segment
IFRS	International Financial Reporting Standards
MIMS	Main Investment Market Segment
NSE	Nairobi Securities Exchange
OECD	The Organization for Economic Cooperation and Development
REITs	Real Estate Investment Trusts
SOX	Sarbanes-Oxley Act of 2002
U.K.	The United Kingdom
U.S.	The United States of America

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Corporate governance provides the structure through which a company's objectives and means of attaining them are set and their attainment monitored (OECD, 2015). The Cadbury Committee defined corporate governance as how companies are directed and controlled (Cadbury, 1992). In 1992, corporate governance gained much traction in the wake of the failures of the Wallpaper group Coloroll and Polly Peck Consortium despite publishing healthy audited financial accounts in 1990. There are many indices used to measure corporate governance. Therefore, not having a universal index creates a challenge when comparing corporate governance components across companies and countries. The various indices are the ant director index, governance index (G-index), Governance Metrics International, Corporate Governance Quotient (CGQ), ratings relative to other companies, the corporate library, standard & poor's (S&P) corporate governance score, deminor rating and the report on business (ROB), (Aguilera & Desender, 2012). The various corporate governance rating indices incorporate various aspects. The board structure and composition is one of the corporate governance components used by Kenyan scholars in their studies (Tarus & Ayabei, 2016). Board structure, according to OECD (2015), varies within and among countries. Through the Capital Markets Act, (2000), the Capital Markets Authority regulates publicly listed companies' board structure and composition in Kenya.

Capital structure is the ratio of total debt to net worth (Schwartz, 1959). Further, capital structure is the debt-to-equity mix firms use to finance their operations (Myers, 2001). To date, there is no universally agreed theory for capital structure choice. There are,

however, several theories that try to explain the rationale taken by firms in determining their optimal capital structure mix. The trade-off theory argues that firms add additional debt to the capital structure, which provides an advantage as the interest on the debt is subtracted from earnings before being taxed. However, as the company takes increased debt, it faces the risk of financial distress and may be unable to find more lenders, or it will face the risk of not being able to settle the obligations when they fall due. Therefore, firms must balance the tax advantage of debt against the risk of possible financial distress.

When internal cash flow is insufficient to fund capital expenditures, the pecking order theory states that firms prefer debt to issue equity. For mature firms prone to overinvest, the free cash flow theory states that high debt levels in the capital structure increase value. Even though there is an elevated risk of financial distress, its value increases when its operating cash flow significantly exceeds its profitable investment opportunities.

Finally, as shown by Modigliani & Miller (1958), a firm's capital structure may not matter. Their study showed no material effect when a firm chooses between equity and debt. By increasing debt for tax advantages, the firm's financial innovation would be extinguished to equilibrium in a perfect and frictionless capital market.

Firms in the same industry have the same capital structure compared to firms in different industries (Harris & Raviv, 1991). In their study, Harris & Raviv (1991) showed a summary of various industries, such as drugs and cosmetics having low leverage, while industries such as petroleum exploration and chemicals have high leverage. Leverage is the ratio of debt to equity. In looking at the determinants of firms' capital structure in various market segments at the NSE, Muema (2013) stated that

profitability and liquidity were the critical determinants in the agricultural sector, while in the firm's commercial and services sector, the size of the firm was the critical determinant.

In exploring the relationship between corporate governance and firm capital structure, Yusuf & Sulung (2019) deduced that corporate governance delivers procedures to overcome the challenges among interested parties to maximise company value. While reviewing companies listed on the Nairobi Securities Exchange, Nyakundi (2016) established that board size is negatively related to capital structure and that boards with more independent directors take on less debt on favourable terms. Nyamweya (2015), on the other hand, established a positive relationship between gender and capital structure and a positive relationship between the number of professionals and capital structure. The study on firms listed in the East African Community securities exchange by Okiro (2015) found a significant positive relationship between corporate governance and firm performance.

1.1.1 Board Structure

Boards should be composed of decision experts in various fields to support specialised decision problems, and the most influential members should naturally be internal (Fama & Jensen, 1983). According to Zahra & Pearce (1989), board structure refers to the board's internal organisation as judged by the division of activities among committees. Further, they state that an efficient board structure is thought to facilitate directors' involvement in shaping the mission and strategies followed by the firm.

The OECD (2015) notes that board structures vary within and among countries. In Kenya, the Capital Markets Act (2000) empowers the Capital Markets Authority (CMA) to promote, regulate, and enhance the facilitation and development of a fair, orderly and efficient capital market. Under the principles of good corporate governance practices, the Capital Markets Act (2000) directs that companies establish relevant committees; and delegate specific mandates to such committees as necessary. Further, to enhance board balance, the board should: comprise a balance of executive directors and non-executive directors (including at least one-third of independent and non-executive directors) with diverse skills and expertise to ensure no individual or minor group can control the board's decision-making process.

Gilson, (1990) identified board structure characteristics to include: the ratio of independent non-executive directors to executive directors, the age of directors, the directors' professional affiliations, and the balance of non-shareholder directors to shareholder directors. According to (Black, Jang, & Kim, 2006), the characteristics of board structure include the following: a board size 6 – 9, the presence of a board has an audit committee, the separation of chairman and CEO, the firm has more than 50% outside directors, the representation of minority shareholders and a remuneration committee. With regards to board diversity, Carter, Simkins, & Simpson, (2003) describe board structure to include: the duality of CEO and board chair, number of annual general meetings, age of directors, number of directors, number of inside directors, number of women directors and the number of minority directors.

1.1.2 Market Segments

According to Bekaert & Lundblad (2011), grouping firms with the same characteristics and opportunities facilitates portfolios that appeal to researchers and investment purposes. In determining the relationship between capital structure and market segments, Harris & Raviv (1991) reviewed various studies that established that firms in the same industry have the same capital structure. For example, the food industry had low leverage consistently across studies, while the cement industry had high leverage.

In Kenya, the Nairobi Securities Exchange NSE (2017) has classified entities listed on the exchange into four equity market segments; Main Investment Market Segment (MIMS), Alternative Investment Market Segment (AIMS), Growth and Enterprise Market Segment (GEMS) and Real Estate Investment Trusts (REITs). The capital markets authority guides the listing requirements through the listing and regulations disclosures CMA, (2002) revised in 2016.

1.1.2.1 The Main Investment Market Segment (MIMS)

The MIMS segment is the premium board for Kenyan companies and the region. It hosts well-established companies in a range of sectors of the economy. The MIMS market segment is for companies that have met the following standards. The issuer is a company limited by shares and registered under the companies act. The company needs to have a minimum authorised, issued, and paid-up ordinary share capital of fifty million shillings. Immediately before the public offering or listing of shares, the company's net assets should not be less than one hundred million shillings. The shares to be listed shall be freely transferable and not subject to any restrictions on

marketability or pre-emptive rights. The directors and management of the company must be ethical, not bankrupt, and not have any criminal proceedings. They must have suitable senior management with relevant experience for at least one year prior to the listing.

Further, the directors and management must not be in breach of any loan covenant, particularly on debt capacity. The company should have audited financial statements complying with International Financial Reporting Standards (IFRS). It is required of companies in this segment to have a clear future dividend policy. In terms of working capital, the companies need to ensure it is adequate and that it should not be insolvent. Finally, at least twenty-five per cent of the shares should be held by not less than one thousand shareholders, excluding company employees.

1.1.2.2 The Alternative Investment Market Segment (AIMS)

The AIMS segment is aimed at mid-cap companies in Kenya and the region. The segment's objective is to assist these companies in accessing capital and offer a public platform to accelerate their growth and development. The companies must have met the following requirements to be listed in this segment.

The companies must be registered under the companies act and limited by shares. They must have a minimum authorised, issued and fully paid-up ordinary share capital of twenty million shillings. Further, it needs to have been in the same line of business for a minimum of two years with demonstrated potential for good growth. Immediately before the public offering or listing of shares, the net assets should not be less than twenty million. The shares to be listed should be freely transferable and not subject to any restrictions on marketability or pre-emptive rights.

The companies should have audited financial records. In addition, the directors and management must be ethical, not bankrupt, and not have any criminal proceedings. The senior management must be suitable and with relevant experience. Both the directors and management must not be in breach of any loan covenant, particularly on debt capacity. The company must have adequate working capital and must not be insolvent.

Finally, at least twenty per cent of the shares must be held by not less than one hundred shareholders, excluding employees of the issuer or family members of the controlling shareholders.

1.1.2.3 Growth and Enterprise Market Segment (GEMS)

The GEMS segment is for small and medium-sized companies. It enables firms to raise substantial capital and accelerate growth within a regulated environment. Therefore, the segment offers flexible listing requirements in recognition of their needs. Companies must meet the following requirements to be listed in this segment.

The company must be registered under the companies act and limited by shares. The issued and fully paid-up ordinary share capital should be a minimum of ten million, and it must have not less than one hundred thousand shares in issue. The shares to be listed must be freely transferable and not subject to any restrictions on marketability or preemptive rights.

Further, the company must have a minimum of five directors. At least a third of the board should be non-executive directors. The company must have adequate working capital and must not be insolvent. The company must ensure that at least fifteen per cent of the issued shares are available to trade by the public. Finally, all issued shares

must be deposited at a central depository established under the (Central Depositories Act, 2000).

1.1.2.4 Real Estate Investment Trusts (REITs)

REITs are financial instruments that facilitate investors acquiring rights of interest in a trust divided into units to earn profits from real estate as beneficiaries of the trust or income. The capital market authority guides the requirements and features of REITS through the (*CMA Collective Investment Schemes Regulations, 2001*).

In Kenya, REITs are categorised into three main types:

- a) Development Real Estate Investment Trusts (D-REITs) – pools investors to acquire real estate to undertake development and construction projects and associated activities.
- b) Income Real Estate Investment Trusts (I-REITs) – pools investors to acquire long-term income-generating real estate.
- c) Islamic Real Estate Investment Trusts – pools investors in undertaking shari'ah-compliant real estate activities.

1.1.3 Capital Structure

In the firm's capital structure theory, Schwartz (1959) defines capital structure as the ratio of total debt to net worth. Capital structure is the mix of debt to equity firms use to finance their operations. Myers (2001) states that the studies on capital structure make an attempt to explain the mix of securities and finance sources used to finance real investments.

According to Modigliani & Miller, (1958), for a firm operating in perfectly efficient markets with information asymmetry, the choice of debt or equity had no effect. In that proposition, a firm does not need an optimal capital structure. In 1963, Modigliani and Miller altered their opinion after including taxes. They determined that the optimal capital structure increased with the debt increase (Modigliani & Miller, 1963).

A firm's optimal capital structure involves the trade-off between the effects of corporate and personal taxes, bankruptcy costs and agency costs (Jensen & Meckling, 1976). Separation of ownership and control results in managers choosing inputs or outputs that do not maximise firm value. Jensen & Meckling (1976) argued that managers' self-interest could be redirected by share ownership, compensation schemes, or other devices; however, the objectives of shareholders and managers are necessarily imperfect.

1.1.4 Board Structure, Market Segment and Capital Structure

A well-structured board is expected to lead to an optimal capital structure that maximises shareholder value. Studies such as that of Nyamweya (2015) have shown a positive relationship between gender, the number of professionals, and firms' capital structure at the NSE. Board size has also been found to positively affect the firm's performance (Zahra & Pearce, 1989). The size of the board leads to optimal capital structures for NSE firms as firms take on debt on favourable terms (Nyakundi, 2016).

For firms in various market segments, their capital structure is expected to have different characteristics and opportunities (Bekaert & Lundblad, 2011). Different firms will have different leverage to optimise their capital structure to maximise shareholder

value. Different industries carry different systematic risks specific to those industries (Harris & Raviv, 1991).

1.1.5 Nairobi Securities Exchange

The Nairobi Securities Exchange was founded in 1954 and self-listed in 2014 in Kenya (NSE, 2021). The NSE is vital in encouraging savings and investments in the Kenya economy. The Capital Markets Authority of Kenya regulates it. The NSE allows companies and investors to access local and international capital, benchmark with global affiliates, and access real-time share price information.

The NSE has equities listed in four market segments NSE (2017), the Main Investment Market Segment (MIMS), the Alternative Investment Market Segments (AIMS), the Growth and Enterprise Market Segment (GEMS), and the Real Estate Investment Trusts (REITs). Within the market segments, there are twelve market sectors. The twelve market sectors are agricultural, investment, automobiles & accessories, banking, investment services, commercial & services, construction & allied, energy & petroleum, insurance, manufacturing & allied, real estate investment trusts and communications. As of October 2022, there are sixty-four quoted equities, with sixty-three listed as companies and one REIT.

The MIMS market segment covers eleven of the twelve sectors at the NSE, with a total of fifty-two companies in the segment. The AIMS segment is in four of the twelve sectors with a total of nine companies, while the GEMS segment is in one of the twelve sectors with two companies.

1.2 Research Problem

Well-structured boards are expected to adopt optimal capital structures that maximise shareholder wealth. Nevertheless, firms in various market segments are expected to have capital structures that exhibit different characteristics and provide different opportunities (Bekaert & Lundblad, 2011). Different firms will have different leverage to optimise their capital structure to maximise shareholder value because of systematic risks specific to those industries (Harris & Raviv, 1991).

Studies by Modigliani & Miller (1958) suggest that the choice of debt and equity has no material effect on the firm's value in a perfect market. The trade-off theory seeks to explain the debt levels that balance the tax advantages of additional debt against financial distress costs. In comparison, the pecking order theory ranks debt as preferable to equity. In contrast, the free cash flow theory suggests that high debt increases firms' value despite the elevated risk of financial distress. Mwambuli (2018) found a statistically significant negative effect of board structure on capital structure decisions for listed firms in East African markets and concluded that firms with better board structure characteristics tend to employ lower debt levels in their capital structures than boards with poor board structure characteristics.

The area of corporate governance gained much attention in the wake of global corporate scandals. Companies of repute failing, such as Tyco, Enron, WorldCom, and others, prompted new ways of looking at corporate governance. An example of such development was the Sarbanes-Oxley Act (2002), which mandated that all listed firms' audit committee members be independent. Sanjai & Brian (2013), in their study of director ownership, governance and performance, found a positive and significant relationship between SOX's board independence and company performance. Yusuf &

Sulung (2019) established that experienced boards direct the optimal mix of capital structures that maximises the benefits of the tax shield from interest on debt and are more inclined to debt in the capital structure. Prior studies have focused on the various aspects independently. Tarus & Ayabei, (2016) studied board composition and capital structure in Kenya. Omuronji, (2018) focused on the effect of heuristic biases on the capital structure of firms listed at the NSE. Mwambuli, (2018) studied how board structure characteristics affect capital structure in East Africa. Okiro, (2015) studied the effect of corporate governance and capital structure on the performance of listed firms listed at the East African communities' exchanges, among others. This study seeks to fill the knowledge gap in the introduction of market segments by looking at the effects of board structure on the capital structure while at the same time looking at the market segments in Kenya to address their effect.

1.3 Research Objective

To determine the effects of board structure and market segment on the capital structure of firms listed on the Nairobi Securities Exchange.

1.4 Value of the Study

The study will provide valuable insight to listed firms at the NSE on the relationship and effects of board structure in their respective market segments to the firms' capital structure. Therefore, key stakeholders such as shareholders who influence the board

structure of the companies shall use the information to assist them in making optimal decisions on their board structure.

Policymakers tasked with enhancing the Kenyan capital markets shall also gain valuable insights on the subject matter. The study shall provide a new perspective on corporate governance regarding the uniqueness of the various segments that could affect regulation.

This study on the relationship between board structure, market segments and capital structure expands the body of knowledge on corporate governance and market structure's impact on capital structure for further research to be undertaken by academicians.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical literature on the relationship between board structure, market segments, and firms' capital structure. The chapter begins with a theoretical review of the different relationships. Next, the chapter proceeds with a review of the determinants of capital structure and empirical studies. Finally, the chapter presents the conceptual framework and the literature review summary.

2.2 Theoretical Review

To gain an understanding of the relationship between board structure, market segment and capital structure, this section reviews various theories relevant to this study. The agency theory by Jensen & Meckling, (1976) posits that agents might not work in the best interest of principals. The stakeholder theory by Freeman, (1999) proposes that management must maintain the relationships of key stakeholders to maximise shareholder value. Harris & Raviv, (1991) posited that systematic risk was industry specific. Schwartz, (1959) proposed that firms have an optimum or range-bound capital structure.

2.2.1 Agency Theory

Agency relationship is defined as a contractual relationship where one or more principal(s) engages an agent and delegate some decision-making authority to the agent to perform defined roles on their behalf (Jensen & Meckling, 1976). The agency theory posits that both parties are utility maximisers. Therefore, this leads to a position where the agent might not act in the principal's best interest. To minimise the problems that

arise from the separation of ownership and control, the principal can take measures to incentivise the agent. These measures taken are the agency costs.

The first cost identified by Jensen & Meckling (1976) is the monitoring of expenditures of the agent by the principal. It includes efforts by the principal to control the agents' behaviour through policies, budgets, and other standard operating procedures. The second cost is the bonding cost. The bonding costs protect the principal should an agent take actions that harm the principal. The final cost is the residual loss, the principal's cost due to the opportunity cost of using funds to monitor the agent.

In this study, the board of directors of the listed firms are the agents for the shareholders. The capital markets authority regulates listed firms at the NSE. Further, as the market has guidelines and regulations, the study expects that boards make decisions that lead to a firm's optimal capital structure based on their market segment.

2.2.2 Stakeholder Theory

In the environment in which an entity operates, several groups, such as governments, employees, suppliers, customers, competitors, shareholders, and the board of directors, among others, play a vital role in the entity's success. Each of these groups has a stake in the entity and, therefore, the term stakeholders (Freeman, 1984). Stakeholders are also described as persons with legitimate interests in an entity (T. Donaldson & Preston, 1995).

In comparison, while the agency theory is concerned with the relationship between two groups (the principal and the agent), the stakeholder theory is concerned with managing the legitimate interests of various groups in decision-making (T. Donaldson & Preston, 1995). In building up a divergent stakeholder theory, management should maintain

relationships with key stakeholders to maximise shareholder value (Freeman, 1999). Stakeholder theory, therefore, implicitly advocates for good essential corporate governance that will facilitate the accommodation of various stakeholders' interests. The board of directors, an essential organ in achieving good corporate governance, is expected to take decisions on the capital structure that align with other stakeholders' expectations, including the market segment.

2.2.3 Stewardship Theory

Stewardship theory, having its roots in psychology and sociology, reviewed how stewards of entities are motivated to act in the principal's best interest (Donaldson & Davis, 1991). The theory postulates that the steward will perceive a higher value in pursuing the firm's objectives above their objective even when the steward and principal's objectives conflict. According to the theory, the stewards' utility function maximises shareholders' wealth. The theory assumes a strong relationship between the principals' satisfaction and the entity's success as measured through increased profits, dividends and share prices (Davis, 1997).

This theory conflicts with the agency theory, which states that agents maximise their utility, and there is agency conflict. However, the theory states that the steward is motivated to act beyond their interest due to intrinsic factors such as affiliation, self-actualisation, achievement and growth, identified in other motivation theories such as Maslow's hierarchy (Maslow, 1981). Therefore, the study expected that in the Kenyan context, directors and management make selfless decisions that will lead to the optimal capital structure of firms in their respective market segments.

2.2.4 Trade-Off Theory

The trade-off theory justifies moderate debt ratios where a firm balances the marginal value of tax shields and financial distress costs. The theory proposes that a firm will take up debt to where the marginal value of the tax shield is offset by the increase in the present value of financial distress cost (Myers, 2001). The financial distress costs include agency costs related to the firms' creditworthiness, reorganisation costs and bankruptcy costs.

The theory, therefore, proposes that firms should never pass interest tax shields even when the probability of financial distress is low. The average firm can lever up and double its interest payments doubling the interest tax shield until marginal benefits decline (Graham, 2000). However, across various jurisdictions, studies on capital structure have found that the most profitable companies tend to borrow the least (Wald, 1999). This inverse relationship is not accounted for in the trade-off theory. Therefore, the trade-off theory proposes that NSE-listed firms with a low probability of financial distress are expected to assume more debt. Therefore, for profitable NSE-listed firms, the directors are expected to take on more debt for interest tax shield benefits affecting the capital structure.

2.2.5 Pecking Order Theory

The pecking order theory assumes that the firm has assets in place and growth opportunities. Further, it assumes there are perfect financial markets; however, investors do not know the assets' intrinsic value or the new opportunities' true value. The theory further postulates that management knows more about the firm value than

potential investors and acts in the best interest of existing shareholders (Myers & Majluf, 1984).

According to the pecking order theory, internal financing is the first source of capital. The theory assumes that information asymmetries are only relevant to external sources of finance. The second source of capital is dividends. External sources of capital are ranked lowest by the theory as the final source of capital. The pecking order theory further orders external sources, with debt preferred to equity. The theory proposes that debt is safer for firms compared to equity.

Therefore, the capital structure for each firm reflects its' external financing requirement needs. The pecking order theory explains why the average firm has a higher debt-to-equity ratio and more profitable firms borrow less as profitable firms have more internal sources of funds available (Myers, 2001). According to this theory, the firms listed in the NSE would structure their capital structure based on available growth opportunities and associated costs. As the market segments are unique and opportunities different, directors are expected to make capital structure decisions that lead to the optimal capital structure.

2.2.6 Free Cashflow Theory

There have been studies on dividend pay-out and whether they align with the interest of managers and their shareholders (Easterbrook, 1984; Rozeff, 1982). The dividends paid to shareholders reduce the resources under managers' control, thus reducing their influence and power. Free cash flow is the excess cash flow required to fund all positive net present value projects that have been discounted at their relevant cost of capital (Jensen, 1986).

The free cash flow theory postulates that debt can be used to motivate managers and can be an adequate substitute for dividends as managers are bonded to their promise of future cash flows in a way that cannot be done through dividends. Therefore, increased leverage in the capital structure reduces the agency cost of free cash flow, although it increases bankruptcy costs. The theory proposes that the optimal debt-equity ratio is achieved at the point marginal cost of debt just offsets the marginal benefit, and the firm's value is maximised. Therefore, the control function of debt is more important to firms with low growth prospects but generates significant cash flows and is more critical for firms that should downsize. For the NSE-listed firms in their various market segments, agency conflict is expected to be managed through debt, and that directors ensure the optimal capital structure for their segment.

2.3 Determinants of Capital Structure

The various theories on capital structure have attributed a range of factors that may affect the debt-equity choice. These include corporate governance (board structure), market segments, tax shields, profitability, size, growth, uniqueness, and earnings volatility. These attributes and their relationship with an optimal capital structure are discussed in this section.

2.3.1 Board Structure

Board structure influences strategies used by firms (Zahra & Pearce, 1989). One of the strategies firms consider is the firm's optimal capital structure to maximise shareholder value. Board structure varies across various countries, and within a country, the structure also varies (OECD, 2015). Various studies have looked at the different constituent components of board structure (Black et al., 2006; Carter et al., 2003;

Gilson, 1990). Board structure components identified include the ratio of non-executive directors to executive directors, the age of directors, professional affiliations, the balance of shareholder directors to non-shareholder directors, the board size, establishment of an audit committee, attendance of board meetings, separation of the role of CEO and chairperson, minority representation and the number of women directors.

The firms will be scored on the board size, availability of information on the independent directors, board meeting attendance, outside directors' attendance of meetings, the presence of directors representing minority shareholders, the presence of women directors, professional affiliations and the disclosure of any board structure changes. In line with the stewardship theory, the board structure is expected to lead to optimal firm structure depending on its unique characteristics. A positive relationship is expected between firms with strong board structures and optimal capital structures.

2.3.2 Market Segments

The capital structure should depend on the uniqueness of its products (Titman, 1984). Unique products and services make it hard for consumers to find alternatives in the case of liquidation, thereby increasing bankruptcy costs (Drobotz & Fix, 2003).

The capital structure would be similar for firms in the same market segment (Bekaert & Lundblad, 2011). The various market segments have been shown to have similar debt-to-equity ratio characteristics (Harris & Raviv, 1991). In the NSE, there are four market segments defined. These are the MIMS, AIMS, GEMS and REITs market segments. The study will use dummy variables to represent the various market

segments. This study expects firms in the same market segments to exhibit similar characteristics and that the firms in different market segments will have different capital structures.

2.3.3 Profitability

Due to the costs of issuing new debt, firms have a pecking order of sources of finance, first from retained earnings to debt to equity (Myers, 2001). These costs have arisen due to the asymmetric nature of information or transaction costs (Myers & Majluf, 1984). Therefore, the pecking order theory asserts a negative relationship between leverage and firms' profitability.

The trade-off theory proposes that firms should not pass interest tax shields even when the probability of financial distress is low. The interest tax shields affect the profitability of firms. The average firm can lever up and double its interest payments doubling the interest tax shield until marginal benefits decline (Graham, 2000). Further, those profitable companies tend to borrow the least (Wald, 1999).

Profitability is the earnings ratio before interest, tax and depreciation (EBITDA) to the firm's book value (Bevan & Danbolt, 2000). A negative relationship between profitability and the firms' capital structure is expected in this study across all market segments.

2.3.4 Firm Size

Scholars have submitted that debt-to-equity ratios may be related to firm size (Ang, Chua, & McConnell, 1982; Jerold, 1977). They propose that direct bankruptcy costs constitute a more considerable proportion of the firm's value as it decreases. They further propose that more prominent firms are less prone to bankruptcy as they are diversified. Smaller firms may be attracted to short-term loans from financial institutions than more prominent firms as they will have lower fixed costs of the loans, and it is more expensive for the smaller firms to issue equity (Clifford, 1977). The trade-off theory further proposes that larger firms would be more levered due to their stable cash flows and diversification than smaller firms (Myers & Majluf, 1984). These studies, therefore, propose that large firms would be more geared compared to smaller firms.

The measure of size will be the natural logarithms of sales (Rajan & Zingales, 1995). It is expected that this study shall show a positive relationship between the size of firms across the various segments and firms' capital structure.

2.3.5 Growth

The firms' growth rate would be affected by the available funds. From the pecking order theory, funds would first be sourced from internally generated funds to debt and finally equity (Myers, 2001). The pecking order theory supports a positive relationship between growth rate and a firm's leverage. However, this view might not hold for firms with more considerable growth opportunities that want to avoid the opportunity costs of forgoing investments or financing future investments with equity. Firms with more growth opportunities have higher agency costs (Drobetz & Fix, 2003).

In the trade-off theory, a firm with more investment opportunities will have less leverage as there are strong incentives to minimise agency costs. This relationship is supported further by the free cash flow theory (Jensen & Meckling, 1976). The study measures growth as the book-to-market equity (Drobetz & Fix, 2003). The study expects a positive relationship between a firm's growth and capital structure in all market segments.

2.3.6 Non-debt Tax Shields

Interest is deducted before firms pay taxes, which firms use to their advantage. The trade-off theory postulates a negative relationship between a non-debt tax shield and leverage. The negative relationship is due to "tax exhaustion", where a firm has issued excessive debt, which crowds out other potential tax shields such as depreciation deductions (Ross, 1985).

Therefore, the non-debt tax shields are substitutes for the benefits of debt financing, and firms with larger non-debt tax shields will use less debt. The non-debt tax shield is measured as the ratio of depreciation to total assets (DeAngelo & Masulis, 1980). A negative relationship is expected for the market segments in this study between the non-debt tax shield and the capital structure.

2.3.7 Earnings volatility

For firms with variable earnings, investors will have challenges forecasting future earnings based on publicly available information, which drives up the cost of debt (DeAngelo & Masulis, 1980). Therefore, firms with volatile earnings must use lower leverage to minimise the default risk of issuing debt for new projects. This assertion is

further supported by the pecking order theory, which predicts a negative relationship between volatile cash flows and leverage.

Volatility is measured as the standard deviation of the first difference in annual EBITDA over a period divided by the average value of total assets over the same time (Bradley, Jarrell, & Kim, 1984). The trade-off theory predicts a negative relationship between a firm's earnings volatility and leverage as more volatile cash flows increase the probability of default. Therefore, this study expects a negative relationship between volatility and capital structure across all segments.

2.3.8 Tangibility

Tangibility is the ratio of fixed assets to total assets, which shows the collateral value of assets on the firms' gearing level (Fama & French, 2002). Shareholders of firms with high leverage are prone to overinvest, leading to the agency problem (Jensen, 1986). The solution proposed to minimise the agency conflict is to restrict the borrower from using the funds raised by debt for specific projects and the debt secured against assets. Therefore, the debts should increase with the tangible firms' assets on the balance sheet.

Tangibility is measured as the fixed-assets ratio to total assets (Rajan & Zingales, 1995). It predicts a positive relationship between the proportion of tangible assets and leverage. Therefore, for all the market segments, the relationship expected in this study is a positive relationship between tangibility and the firms' capital structure.

2.4 Empirical Studies

The literature reviewed covers global and local studies on the relationship between board structure, market segments, and firms' capital structure.

2.4.1 Global Studies

Several studies try to explain the capital structure variation among firms based on the benefits and costs of equity and debt sources of finance. In the U.K., Bevan & Danbolt, (2000) conducted a decomposition analysis of 822 firms on capital structure and their determinants. The study's objective was focused on the difficulties of measuring gearing and testing the sensitivity of size, tangibility, and growth opportunities for firms with the relationship in variations to gearing. The period covered in the study was from 1988 to 1991, and the technique used was regression analysis. The study showed that gearing varied significantly depending on the nature of the debt, whether long-term or short-term. The study proposes that smaller firms may have difficulty raising long-term debt, and firms with high growth opportunities would have higher debt.

In looking at the determinants of capital structure across G-7 countries, Rajan & Zingales (1995) found that the factors identified by prior studies in the United States also applied to the other G-7 countries. The study's main objective was to establish if the factors affecting capital structure for U.S. firms were the same for the other G-7 countries. The study period was from 1987 to 1991, focusing on non-financial firms as financial firms such as banks and insurance companies were considered to have strong implicit and explicit leverage influence from regulations. The sample used a cross-sectional comparative study and covered between 30 to 70 per cent of listed firms in the countries and represented more than 50 per cent of market capitalisation. The

conclusion from the study was that at an aggregate level, firm leverage is similar across countries. The study has implications for this study of firms listed on the NSE as the expectation is that the theory applies equally across and does not apply in specific geographical locations.

In the study looking at the capital structure determinants, Titman & Wessels (1988) studied the following attributes: earnings volatility, growth, industry classification, size, uniqueness, profitability, asset structure, size and non-debt tax shields. The study's objectives were to analyse capital structure theories that had not been analysed empirically and analyse the various debt measures as they had different empirical implications. Titman & Wessels (1988) looked at the data from 1974 through to 1982 for 469 US firms using a facto-analytic technique for approximating the effect of unobservable features on the choice of firm debt ratios. The study showed that uniqueness was negatively related to debt levels and that transaction costs are an essential determinant of capital structure. Firm size was negatively related to short-term debt, and the debt levels are negatively related to profitability. The study found no effect on the debt ratios from volatility, non-debt tax shields, future growth, and collateral value. This study laid a foundation for empirical studies consistent with capital structure theories.

2.4.2 Local Studies

Omuronji (2018) studied 44 NSE-listed firms to determine the effects of heuristic biases on capital structure from 2015 to 2018. The study used variance analysis and regression model analysis to establish the relationship. The study established that heuristic biases had a negative effect on firm leverage and that firm size and tangibility had a statistically significant effect on capital structure. It is expected that the size and

tangibility of firms for the various market segments would have statistically significant relationships with firms.

Wangui (2016) studied the relationship between capital structure and corporate taxes for NSE-listed firms from 2001 to 2012. The sample size was 46 NSE-listed firms which excluded financial firms. The study used regression analysis and established a negative and significant relationship between capital structure and taxes profit ratio. In looking at the relationship between board structure and market segments on capital structure, this study will use a non-debt tax shield as one of the variables. The relationship established in Wangui (2016) is expected to match this study's outcome.

The study on the effects of capital structure on the cost of capital for NSE-listed firms by Boyani (2015) for the period between 2010 and 2014 looked at 53 listed firms. Out of which, due to limitations, thirty firms were studied. Regression analysis was used to determine the effect of capital structure on debt and equity costs for listed firms on the NSE. The study established a positive relationship between firm size, capital structure and cost of capital, with firm size being found as a cost of capital determinant. In line with this study, market segments are expected to display similar relationships with firm size.

The study to determine the relationship between board composition and the financial performance of NSE-listed firms by Albert (2013) looked at a sample of 52 out of a population of 62 listed firms. The study period was between 2008 and 2012, and utilised a regression model to study the relationship. Albert (2013) established a positive relationship between board independence, board size and financial performance, while gender diversity and the proportion of executive directors had a negative relationship.

This result is counterintuitive to the notion of diversity. This study expects to show that board size affects capital structure depending on the firm's market segment.

2.5 Conceptual Framework

The study uses board structure components and capital structure determinants as the independent variables. The board structure components include board size, board representation of minority shareholders, board meeting attendance, board representation of women and the ratio of non-executive directors to executive directors. Determinants of capital structure, which include profitability, size, growth, non-debt tax shield, earnings volatility, and tangibility, have been used as control variables. The intervening variables are the market segments, while the dependent variable is capital structure measured as total debt to equity.

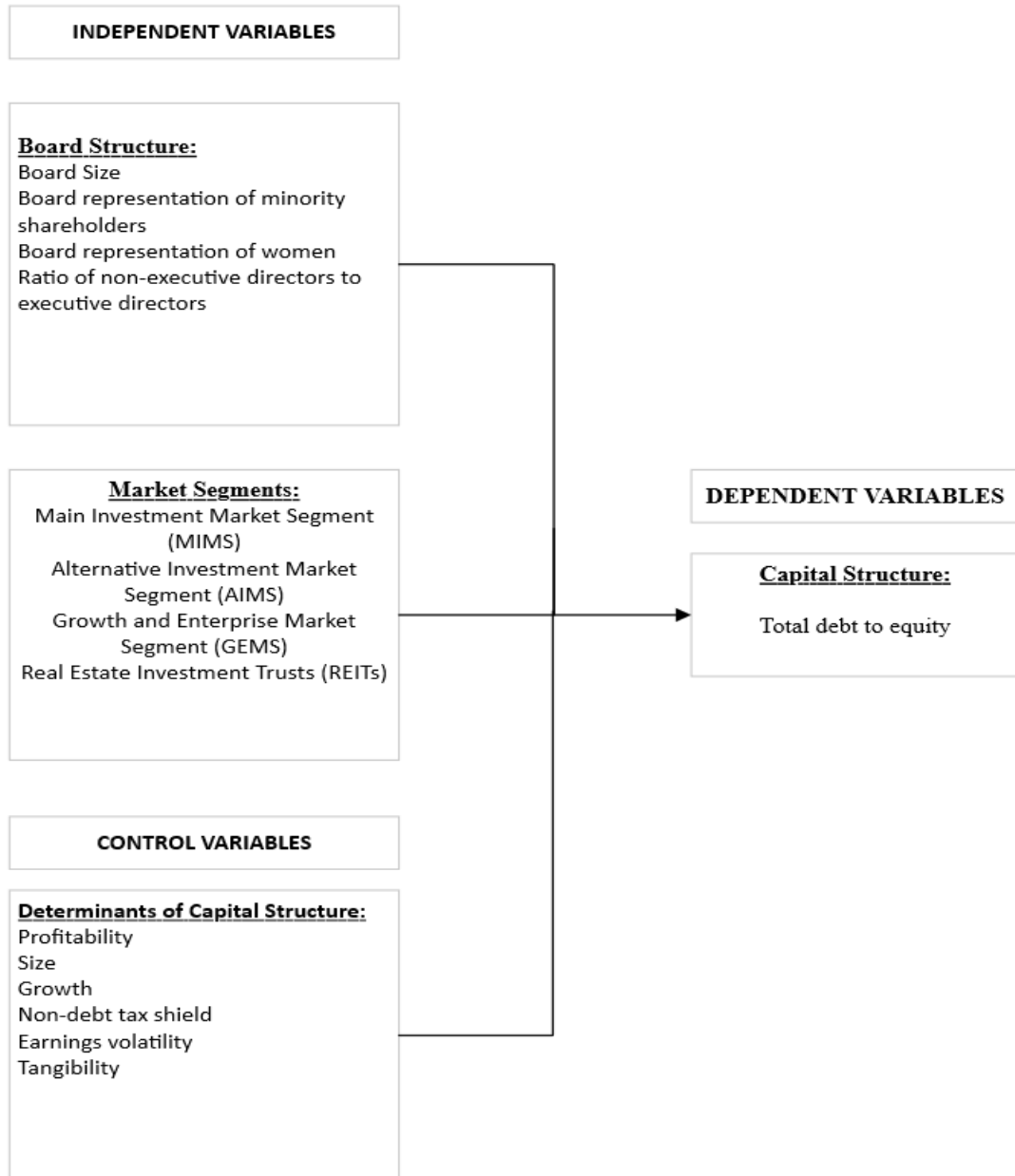


Figure 1: Conceptual Framework

2.6 Summary of Literature Review

From the literature, there are research gaps that the scholars have highlighted. One such gap is that the choice of the indicator to describe the underlying attribute might not accurately reflect the nature of the attribute as described by theory (Titman & Wessels,

1988). There are also gaps in models that relate capital structure to firm variables, such as strategic variables, cost parameters and demand (Harris & Raviv, 1991). There needs to be a further investigation of the proxies used by scholars as the proxies for theory to strengthen the relationship between empirical specifications and theoretical models and a deeper understanding of firms' uniqueness (Rajan & Zingales, 1995). Another gap identified by a Kenyan scholar is the need to look at market segments regarding capital structure (Boyani, 2015). Albert (2013) identified the need to look at other board structure components such as age, tenure, and background of directors for NSE-listed firms.

The gaps identified in the studies on capital structure and the effects of board structure have been varied and numerous, as outlined above. This study seeks to fill the research gaps identified by various scholars by looking at the effects of board structure and market segments on capital structure.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research design, the population of the study, the sample design employed, and the data collection methods are discussed in this chapter. Further, the chapter delves into the validity and reliability of the data collection instrument used for the study and concludes with the data analysis.

3.2 Research Design

This study adopted a descriptive research design. Descriptive research aims to understand persons, situations, or events accurately. The design allows the phenomenon to be pictured before collecting data (Saunders, Lewis, & Thornhill, 2015). The study sought to explain the influence of board structure and market segments on capital structure; therefore, a descriptive design was used to assess the hypothesised relationship among the variables.

3.3 Population

The research population comprised sixty-four listed equities, sixty-three firms, and one REIT. Due to the strong influence of regulators on the capital structure of financial firms, they were excluded from the research (Rajan & Zingales, 1995). The financial firms included eleven from the banking sector, six from the insurance sector, four from the investment sector and one from the investment services sector. The study period was from 2015 to 2019, excluding the financial year 2020 due to the Covid-19 pandemic that affected the whole world, which could have distorted firms' capital

structure. There is a need for sufficient observations post-2020 for the effects of the pandemic to be empirically determined.

3.4 Sample Design

The target population was covered fully except for the financial firms; therefore, there was no sampling. Survivorship bias distorts performance studies (Brown, Goetzmann, Ibbotson, & Ross, 1992). Therefore the study included all the firms in the period to avoid survivorship bias.

For the period under review, the MIMS market segment had one hundred and forty observations, the AIMS market segment had forty observations, GEMS had five observations, and REITs had five observations. A guideline for quantitative variables is to have thirty observations (Agresti & Min, 2002). Therefore, the GEMS and REITs market segments were dropped as they did not meet the threshold.

3.5 Data Collection

Secondary data from audited financial statements for the fiscal years 2015 to 2019 were used in the research. The data were summarised for the periods under review, and various ratios were computed to represent the variables under review.

3.6 Data Analysis

The study used descriptive statistics to describe the variables, while regression analysis determined the relationship between board structure and market segments on capital

structure. Graphs were used to interpret the data and gain further insights. The data were analysed using the STATA data analysis software.

3.6.1 Analytical Model

The study used a multiple linear regression model to determine the relationship between board structure and market segments on capital structure. The form of the model used is shown below.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon \quad (1)$$

Where:

The dependent variable was:

Y = Capital structure; measured by total debt to equity

The independent variables were:

X_1 = Board size; no. of board members

X_2 = Representation of minority shareholders in the board; Ratio of board members representing minority shareholders

X_3 = Ratio of women representation on the board

X_4 = Ratio of independent directors to executive directors.

X_5 = Profitability; measured by EBITDA to book value

X_6 = Size; measured by the natural log of sales

X_7 = Growth; measured by book value to market value

X_8 = Non-debt tax shield; measured by depreciation to total assets

X_9 = Earnings volatility; measured by the standard deviation of the first difference in annual EBITDA over a period divided by the average value of total assets over the same time

X_{10} = Tangibility; measured by fixed assets to total assets

The Constant term was α , while the regression coefficients were β_{1-10}

The error term was ε , which is the unobservable error or disturbance term.

3.6.2 Tests of Significance

The F-test tested the joint significance of all the coefficients simultaneously. The null hypothesis was that board structure and market segment do not affect firms' capital structure on the Nairobi Securities Exchange. The null will have been rejected if the test statistic exceeds the critical F-value set at the 5% level.

To measure how well the entire regression model fitted the data, R^2 was used. It showed how well the sample regression fitted the data and how close the fitted line was to all the data points. R^2 is bound between zero and one with a higher R^2 implying ceteris paribus, the model fitted the data better.

3.7 Validity and Reliability

Validity refers to the appropriateness of the measures used, the accuracy of analysis of the results and the generalisability of findings, and reliability refers to the replication and consistency of the research (Saunders et al., 2015). For the research to be valid and reliable, the following assumptions were tested to ensure the reproducibility of the research.

3.7.1 Normality

To make valid inferences about the population parameters (α and β) from the sample parameters ($\hat{\alpha}$ and $\hat{\beta}$) using finite data, the error term distribution should be normal for the classical linear regression model. Where normal distribution takes the form:

$$\mu_t \sim N(0, \sigma^2) \quad (2)$$

When normality is violated, it is challenging to determine if the model coefficients are significantly different from zero and the forecast confidence intervals. The Jarque-Bera test was used for normality (Jarque & Bera, 1987). The test used the mean and variance for the first two moments of a random variable. The third-moment skewness measures how the variable is not symmetric about its mean, and the fourth-moment kurtosis measures the fatness of the tails. Therefore, a normal distribution is symmetric, not skewed and has a kurtosis of three.

3.7.2 Zero conditional Mean

Zero conditional mean refers to the average value of the errors expected to be zero for the classical linear regression model. It is expressed as:

$$E(\mu_t) = 0 \quad (3)$$

The assumption will never be violated if a constant term exists in the regression equation.

3.7.3 Linearity

The relationship between the dependent and independent variables was expected to be a straight-line function of each independent variable holding the others fixed. The slope of the regression line was not dependent on other variables, and the effects of the independent variables on the dependent variable were expected to be additive. Linearity was diagnosed by plotting residuals versus predicted values.

3.7.4 Statistical Independence

It was expected for the disturbance term of the classical linear regression model that there were no correlations between consecutive errors over time or cross-sectionally and that the errors were linearly independent. The relationship is described as follows:

$$cov(\mu_i, \mu_j) = 0 \text{ for } i \neq j \quad (4)$$

A plot of residual time series plot and a table or plot of residual autocorrelations was used to test for statistical independence. A formal statistical test was used, the Durbin-Watson (DW) test, which tests the relationship between an error and its immediate previous value (Durbin & Watson, 1951).

3.7.5 Homoscedasticity

For the classical linear regression model, the assumption was that the variance of the errors is constant and finite over all the values of x_t . This relationship is expressed as:

$$\text{var}(\mu_t) = \sigma^2 < \infty \quad (5)$$

Violations of this relationship make it challenging to gauge the true standard deviation of the forecast errors resulting in confidence intervals that are too narrow or too wide. To test this assumption, a plot of residuals versus predicted values or residuals versus time showed if residuals grow as a function of time or predicted values. The formal white's general test for heteroskedasticity was used to test for heteroskedasticity.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis and interpretation of the findings from the data obtained from the listed companies at the NSE. The statistical program STATA was used to analyse and summarise the data. The research sought to establish the effect of board structure and market segment on the capital structure of firms listed in the Nairobi Securities Exchange. The chapter begins with a review of the sample, data validity, and descriptive statistics. The chapter concludes with a discussion of the research findings.

4.2 Sample Analysis

The study looked at the listed firms at the NSE in the MIMS and AIMS market segments. The study period was from 2015 to 2019, with twenty-nine firms in the market segments. The sample yielded one hundred and forty-five data points, far exceeding the thirty observations as guided in (Agresti & Min, 2002).

4.3 Data Validity

For the research to be valid and reliable, the following assumptions were tested to ensure the reproducibility of the research.

4.3.1 Normality

The Jarque-Bera test was used for normality using the mean and variance for the first two moments of the residuals. The third-moment skewness measures how the residual is symmetric about its mean, and the fourth-moment kurtosis measures the fatness of the tails. The following table results are output from running the Jarque-Bera test on the residuals of the regression.

Skewness/Kurtosis tests for Normality					
Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
resid	145	0.8703	0.0000	25.20	0.0000

Table 1: Normality test - Jarque-Bera

The test's null hypothesis was that the data follows a normal distribution. The probability of skewness was 0.8703, which implies that it was asymptotically normally distributed. However, the probability of kurtosis was 0.0000, which meant that it was not asymptotically distributed. With a chi value of 0.0000, which is less than 0.05, the null hypothesis was rejected. Therefore the residuals do not follow a normal distribution.

The Jarque-Bera test was further confirmed by looking at Figure 2: Distribution of residuals histogram, which showed the distribution of the residuals was leptokurtic.

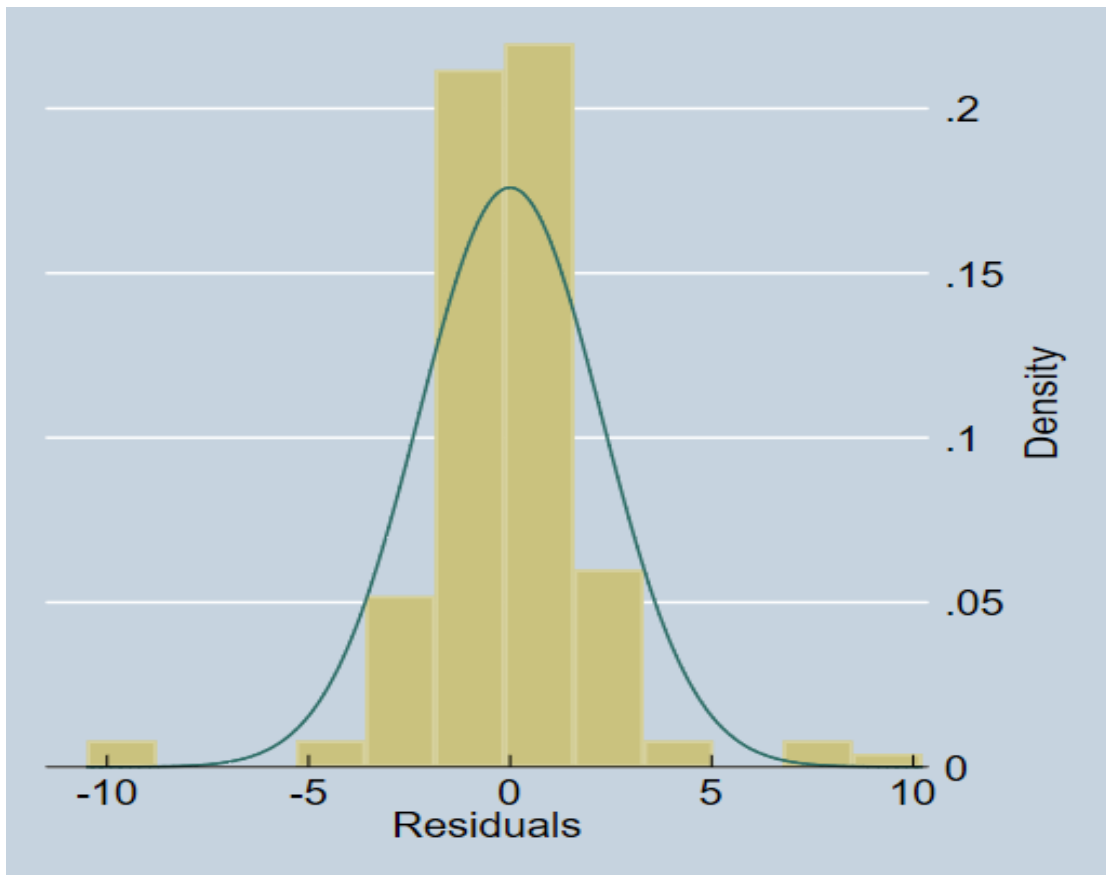


Figure 2: Distribution of residuals histogram

4.3.2 Zero Conditional Mean

Zero conditional mean refers to the average value of the errors expected to be zero for the classical linear regression model. The distribution of errors across the mean was tested using a graphical method. From Figure 3: Residuals Vs Fitted Values shown below, the mean of the residuals was clustered around zero. However, there were a few outliers, meaning the regression model might not be perfect.

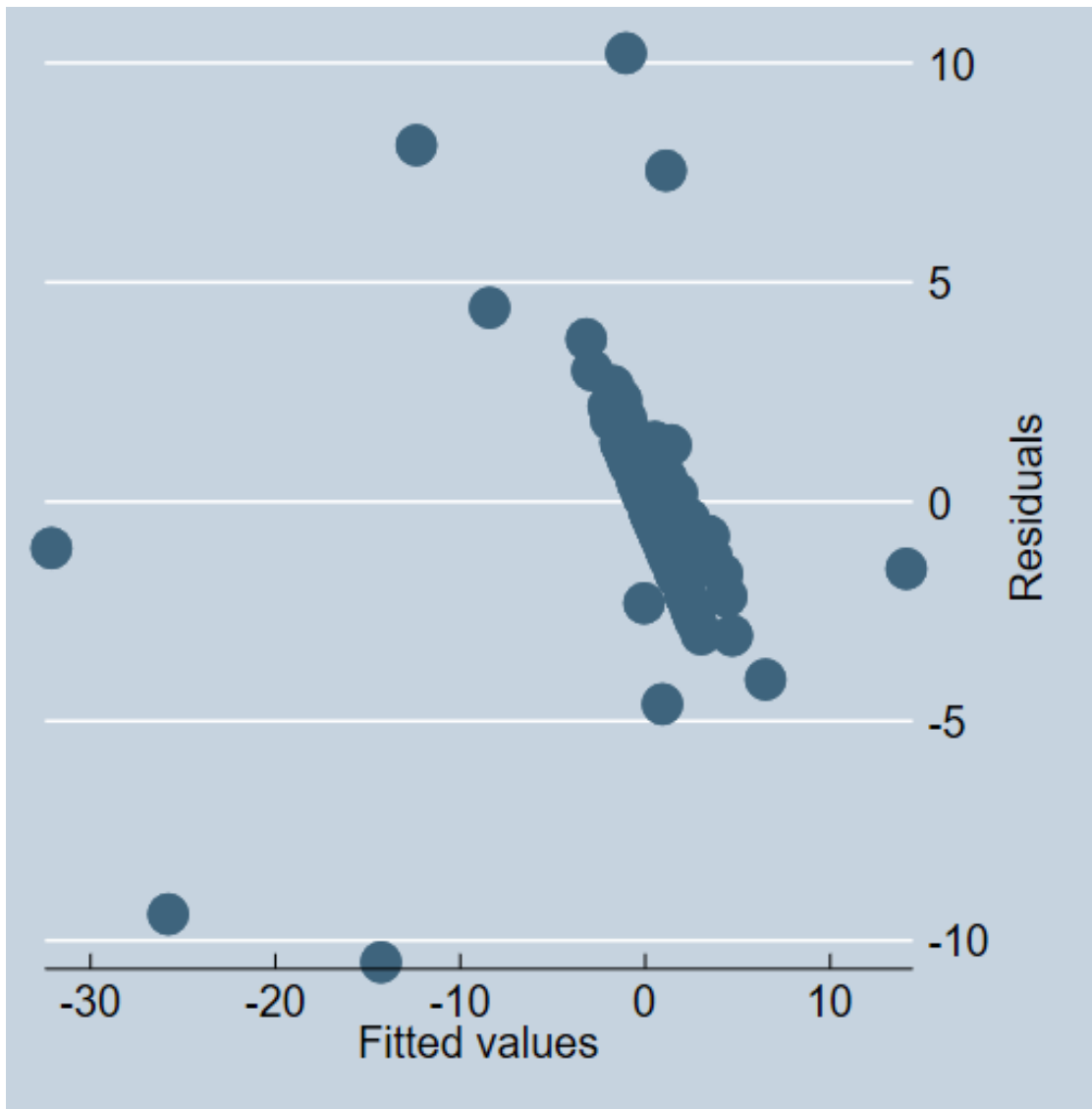


Figure 3: Residuals Vs Fitted Values

4.3.3 Linearity

The relationship between the dependent and independent variables was expected to be a straight-line function of each independent variable holding the others fixed. Figure 4: Linearity Test shows the linearity of the variables. The variable minority shareholders representation (X2) was omitted as it was zero for all firms in the study.

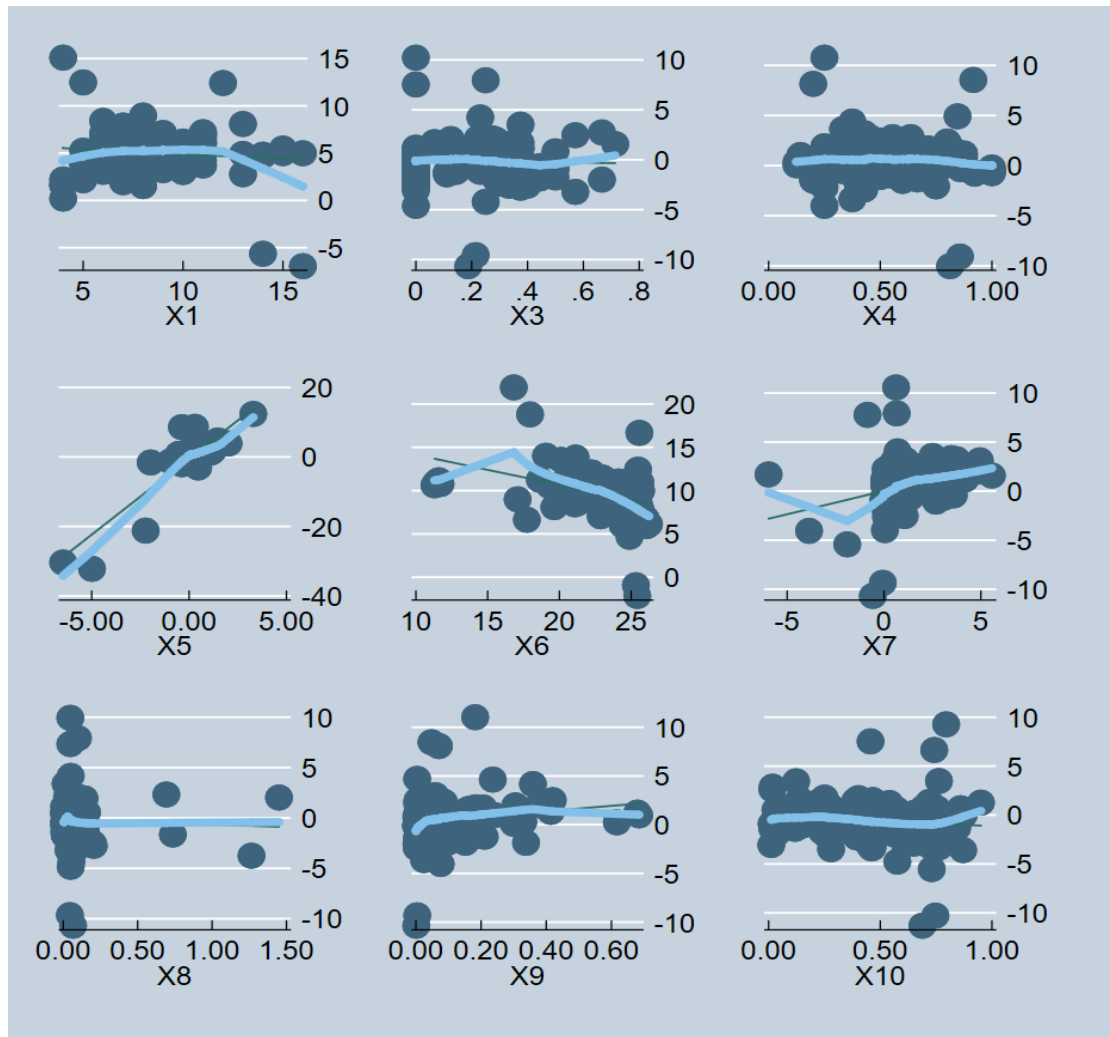


Figure 4: Linearity Test

All the variables save for board size (X1), firm size (X6), and growth (X7) showed linearity. Therefore the variables could be transformed to make them linear.

4.3.4 Statistical Independence

It was expected for the disturbance term of the classical linear regression model that there were no correlations between consecutive errors over time or cross-sectionally

and that the errors were linearly independent. Looking at the residuals over time, as shown in Figure 5: Residuals Stationarity, the residuals seem stationary around the mean of zero.

Figure 5: Residuals Stationarity

The Harris-Tsavalis unit root test further confirmed that the residuals were stationary, as shown by the results below.

```
Harris-Tzavalis unit-root test for Residuals
-----
Ho: Panels contain unit roots          Number of panels =    29
Ha: Panels are stationary              Number of periods =     5

AR parameter: Common                  Asymptotics: N -> Infinity
Panel means:   Included                T Fixed
Time trend:   Included
```


	Statistic	z	p-value
rho	-0.6011	-5.1779	0.0000

With a p-value of 0.000, the null hypothesis that the residuals have unit roots was rejected, and therefore the residuals were stationary.

4.3.5 Homoscedasticity

The classical linear regression model assumes that the variance of the errors is constant and finite over all the values of x_t . The plot of residuals vs fitted (predicted) values is shown in Figure 6: Heteroscedasticity below.

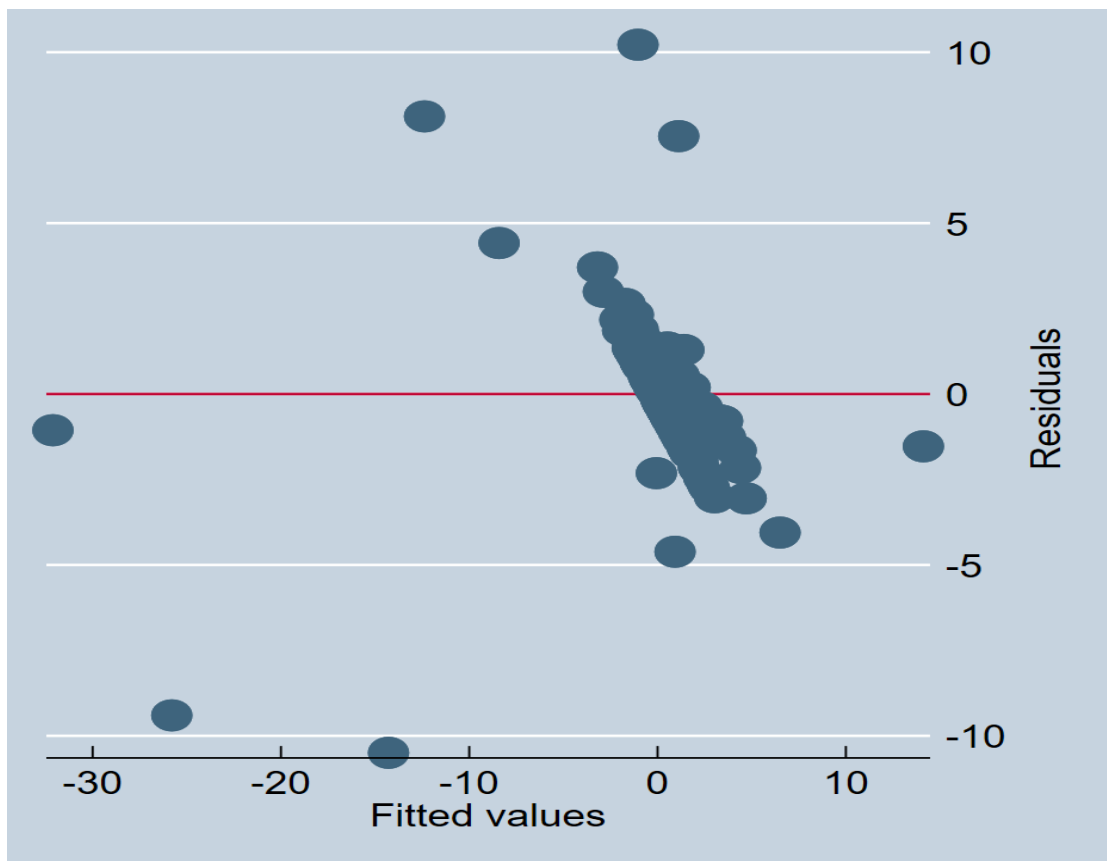


Figure 6: Heteroscedasticity

There is no clear pattern of heteroscedasticity. The results of White's test are shown below.

Cameron & Trivedi's decomposition of the IM-test

Source	chi2	df	p
Heteroskedasticity	133.86	64	0.0000
Skewness	27.29	10	0.0023
Kurtosis	4.97	1	0.0258
Total	166.12	75	0.0000

The null hypothesis was that the variance of the residuals was homogenous. With a p-value of 0.000, the null hypothesis was rejected. In combination with the graph above, it was concluded that there is heteroscedasticity in the residuals.

4.4 Descriptive Statistics

Table 2: Overall Descriptive Statistics below represent all the firms in the study. The table summarises all the variables combined for the MIMS and AIMS market segments.

Table 2: Overall Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Y	145	-4%	488%	-3520%	1259%
X1	145	8	2	4	16
X2	145	0	0	0	0
X3	145	19%	17%	0%	71%
X4	145	53%	21%	13%	100%
X5	145	20%	90%	-646%	330%
X6	145	22.39	2.83	11.29	26.25
X7	145	122%	156%	-596%	557%
X8	145	8%	18%	1%	145%
X9	145	9%	12%	0%	69%
X10	145	43%	25%	1%	95%

Table 3: Descriptive Statistics by Segment

	Market Segment	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
mean	AIMS	62%	6	0	12%	36%	14%	18.62	127%	5%	12%	41%
	MIMS	-18%	9	0	20%	56%	21%	23.18	121%	8%	9%	44%
std	AIMS	268%	2	0	20%	9%	23%	3.93	189%	2%	15%	22%
	MIMS	522%	2	0	17%	21%	99%	1.72	149%	19%	12%	25%
min	AIMS	-368%	4	0	0%	20%	-53%	11.29	-387%	2%	0%	8%
	MIMS	-3520%	5	0	0%	13%	-646%	19.07	-596%	1%	0%	1%
25%	AIMS	0%	5	0	0%	25%	7%	17.09	20%	3%	4%	26%
	MIMS	2%	7	0	5%	43%	6%	21.92	18%	3%	2%	26%
50%	AIMS	3%	7	0	0%	38%	15%	20.91	70%	5%	7%	42%
	MIMS	23%	8	0	22%	56%	18%	23.01	77%	4%	5%	41%
75%	AIMS	35%	7	0	22%	43%	25%	21.19	264%	6%	18%	46%
	MIMS	92%	9	0	31%	70%	57%	24.44	215%	6%	9%	69%
max	AIMS	918%	9	0	67%	50%	48%	22.11	557%	10%	69%	80%
	MIMS	1259%	16	0	71%	100%	330%	26.25	506%	145%	68%	95%

For this study, breaking down the descriptive statistics provided insight into the various market segments, as shown in Table 3: Descriptive Statistics by Segment.

For the capital structure (Y), firms in the AIMS market segment carried more debt to equity than firms in the MIMS segment. On average, the firms in the AIMS market segment had a lower standard deviation in the capital structure than firms in the MIMS segment.

Regarding board size (X1), firms in the AIMS market segment had less number of board members. The range of board members was from four, the lowest in the AIMS market segment, to a maximum of sixteen in the MIMS market segment.

For all the firms in the study, there were no board members representing minority shareholders (X2). This aspect of corporate governance seems not to be practised at the NSE.

On average, firms in the MIMS market segment had more women on the board than firms in the AIMS segment (X3). However, the representation in both segments goes to as low as zero per cent in some firms. There were firms, however, with very high representation of women on their boards, with the highest at seventy-one per cent in the MIMS market segment and sixty-seven per cent in the AIMS market segment.

On average, independent directors' representation (X4) was more than a third in both the AIMS and MIMS market segments. With the AIMS market segment at thirty-six per cent and the MIMS market segment at fifty-seven per cent.

Firms in the MIMS market segment were more profitable (X5) than firms in the AIMS market segment, with an average of seven per cent more profitable over the study

period. However, the firms in the MIMS market segment had a higher standard deviation on their profitability at ninety-nine per cent compared to twenty-three per cent for the AIMS segment. Although there was a higher standard deviation in the MIMS market segment, there were higher returns, with profitability in the MIMS segment going up to three hundred and thirty per cent compared to forty-eight per cent in the AIMS segment.

As expected, the firm size of firms (X6) in the MIMS market segment was, on average, more significant than in the AIMS segment. There was minimal variation in size in the MIMS market segment, with a standard deviation of 1.92 compared to firms in the AIMS market segment.

Firms in the AIMS market segment had, on average more growth opportunities (X7) than those in the MIMS market segment. The resulting difference in growth opportunities was expected. However, the difference in growth opportunities between the segments was only six per cent.

Firms in the AIMS market segment had, on average lower non-debt tax shields (X8) than firms in the MIMS market. However, some firms in the MIMS market had maximised the non-debt tax shields up to one hundred and forty-five per cent compared to the maximum of ten per cent in the AIMS market segment.

The earnings volatility (X9) of firms in the AIMS segment was much higher by 3% than those in the MIMS market segment. Further, firms in the AIMS segment had higher standard deviations on their earnings than those in the MIMS segment.

The tangibility of firms (X10) in the MIMS market segment was higher than those in the AIMS market segment by 3%. With a maximum of ninety-five per cent in the MIMS

market segment and a minimum of one per cent compared to a maximum of eighty per cent and a minimum of eight per cent in the AIMS market segment.

4.5 Correlation Analysis

Pearson correlation measures the direction and strength of the relationship between the study variables. The table below shows the relationship between the variables.

Table 4: Correlation Analysis

	Y	X1	X3	X4	X5	X6	X7	X8	X9	X10
Y	1									
X1	-0.3813	1								
X3	-0.016	0.2067	1							
X4	-0.2494	0.3389	-0.0587	1						
X5	0.8442	-0.2246	0.0159	-0.2005	1					
X6	-0.1545	0.541	0.0601	0.2684	0.0298	1				
X7	0.1728	-0.0557	-0.0204	-0.0737	0.0714	0.1493	1			
X8	0.0002	-0.0915	0.4025	-0.1481	-0.0602	-0.1174	-0.0421	1		
X9	0.1025	-0.1855	0.1771	-0.1833	0.0338	-0.0143	-0.097	0.307	1	
X10	-0.1509	0.2203	0.1012	0.0018	-0.0628	0.1832	0.1219	-0.2306	-0.2999	1

The Pearson correlation showed a strong positive relationship between capital structure (Y) and profitability (X5). The weakest relationship between variables was between women's representation on the board (X3) and the representation of independent directors (X4), and the relationship between the two variables was negative.

The regression model estimates cannot be uniquely computed when there is a perfect linear relationship among the independent variables. The variance inflation factor (VIF) was used to check on the concern for the degree of multicollinearity.

The results of the multicollinearity test from running VIF are shown below.

Table 5: VIF

Variable	VIF	1/VIF
X1	1.89	0.529595
X3	1.43	0.697199
X4	1.36	0.734233
X5	1.16	0.863371
X6	2.47	0.405239
X7	1.11	0.899967
X8	1.46	0.686776
X9	1.36	0.732802
X10	1.27	0.786024
Market Segment	1.98	0.505412
Mean VIF	1.55	

A value of one indicates no correlation between one to five moderate and above five severe correlations. The table shows a moderate correlation; overall, the correlation was very low. Therefore there was no concern for multicollinearity.

4.6 Regression Analysis

A multiple linear regression model was used to determine the relationship between board structure and market segments on capital structure for the firms listed at the NSE. The market segment was encoded as a categorical variable of interest for the study in

the regression model as X11. The results of the regression are shown below. Further, X2 was dropped from the regression as it was zero for all the firms in the study period.

Source	SS	df	MS	Number of obs	=	145
Model	2685.65544	10	268.565544	F(10, 134)	=	48.63
Residual	740.103435	134	5.52315996	Prob > F	=	0.0000
				R-squared	=	0.7840
				Adj R-squared	=	0.7678
Total	3425.75888	144	23.7899922	Root MSE	=	2.3501

Y	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
X1	-.1733307	.1131521	-1.53	0.128	-.3971259 .0504644
X3	-.4251838	1.348698	-0.32	0.753	-3.092673 2.242305
X4	-.3556054	1.083074	-0.33	0.743	-2.497737 1.786527
X5	4.377352	.2338153	18.72	0.000	3.914906 4.839798
X6	-.3268472	.1087578	-3.01	0.003	-.5419511 -.1117432
X7	.4713147	.1326004	3.55	0.001	.2090542 .7335751
X8	-.2432588	1.34749	-0.18	0.857	-2.908358 2.421841
X9	2.702865	1.885429	1.43	0.154	-1.026185 6.431915
X10	-.9765968	.8948521	-1.09	0.277	-2.746458 .7932648
X11					
MIMS	1.01662	.7267654	1.40	0.164	-.4207951 2.454035
_cons	6.864848	1.819639	3.77	0.000	3.26592 10.46378

Table 6: Regression Results

The F-test tests the joint significance of all the coefficients simultaneously. The null hypothesis was that board structure and market segment do not affect firms' capital structure on the Nairobi Securities Exchange. The null hypothesis was not rejected as the test statistic did not exceed the critical F-value set at the 5% level.

Further, the adjusted R-squared was at 0.7678, meaning 76.78% variance in capital structure could be explained by board structure and market segment. Therefore, the model specification is shown as follows:

$$Y = 6.86 - 0.17X_1 - 0.43X_3 - 0.36X_4 + 4.38X_5 - 0.33X_6 + 0.47X_7 - 0.24X_8 + 2.7X_9 - 0.98X_{10} + 1.02X_{11} + \varepsilon$$

4.7 Discussion of Research Findings

The study showed a negative relationship between board size (X1) and capital structure. Firms in the MIMS market segment had larger boards than those in the AIMS market segment. One possible reason for having a negative relationship is that as firms grow, they have more internally generated funds to cater to developmental and recurrent expenditures. Therefore there is a need for less external debt and thus reducing the capital structure. Another reason is that as firms mature, they become more risk-averse and prefer reduced debt to manage their risks.

There was a negative relationship between capital structure and women's board representation (X3). Further, women's representation was higher in the MIMS market segment than in the AIMS segment. The study showed that having more women on boards leads to a more risk-averse firm taking on less debt.

There was a negative relationship between capital structure and having independent director representation (X4). Further, more independent directors are in the MIMS market segment compared to the AIMS segment. The study results showed that having more independent directors leads to firms taking on less debt.

There is a positive relationship between capital structure and firm profitability (X5). Further, firms in the MIMS market segment were more profitable on average than those in the AIMS market segment. The results align with prior studies' expectations (Bevan & Danbolt, 2000). Profitable companies tend to borrow the least (Wald, 1999)

The study results showed a negative relationship between firm size (X6) and capital structure. Further, firms in the MIMS market segment were larger on average than in the AIMS market segment. The results depart from the expected trade-off theory, which

proposes that larger firms would be more levered due to their stable cash flows and diversification than smaller firms (Myers & Majluf, 1984). The departure could be due to the influence of best corporate governance practices with the inclusion of independent directors, women and other factors which have become emergent issues.

The study showed a positive relationship between growth (X7) and capital structure. Further, on average, firms in the AIMS market segment had more growth opportunities than those in the MIMS segment. The findings align with prior studies where firms with more considerable growth opportunities want to avoid the opportunity costs of forgoing investments or financing future investments with equity (Drobotz & Fix, 2003).

The non-debt tax shield (X8) negatively affected the capital structure. The firms in the AIMS market segment have lower non-debt tax shields than in the MIMS segment. The study findings align with the trade-off theory that postulates a negative relationship between a non-debt tax shield and leverage. The negative relationship was due to “tax exhaustion”, where a firm has issued excessive debt, which crowds out other potential tax shields such as depreciation deductions (Ross, 1985).

According to the research findings, earnings volatility (X9) positively affected capital structure. Further, the AIMS market segment earnings volatility was higher on average than in the MIMS segment. The trade-off theory predicts a negative relationship between a firm’s earnings volatility and capital structure as more volatile cash flows increase the probability of default. However, considering the effect of the AIMS market segment’s higher earnings volatility, this could have affected the results.

The research shows that tangibility (X10) negatively affected capital structure. Further, tangibility was higher for firms in the MIMS market segment than those in the AIMS

segment. Agency theory postulates a positive relationship between tangibility and capital structure as shareholders of firms with high leverage were prone to overinvest, leading to the agency problem (Jensen, 1986). However, developments in corporate governance structures, in particular board structure, may have affected the relationship in the inverse.

Finally, the study showed that the effect of market segment is approximately one for either firm in the MIMS market segment or AIMS market segment. However, this difference is not statistically significant as the null hypothesis that it is zero was not rejected as the beta has a p-value of 0.164.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings from the research study, the conclusion drawn, recommendations, limitations of the study and suggestions for further research.

5.2 Summary of Findings

The study objective was to determine the effect of board structure and market segment on the capital structure of firms listed in the Nairobi Securities Exchange. The research findings showed that board structure and market segment affect firms' capital structure on the NSE.

The study showed that board structure overall affects capital structure in both market segments. The characteristics of board structure considered in the study were board size, women representation and representation of independent directors. While looking at the board structure, an increase in the board size and women's and independent directors' representation was shown to reduce leverage. A reduction in leverage reduces the perceived risk in the firm and improves capital structure.

In order to carry out the study, control variables were needed. The control variables were profitability, size, growth, non-debt tax shield, earnings volatility and tangibility. Considering the control variables, capital structure and market segment, they can explain seventy-eight per cent variation in capital structure in both the MIMS and AIMS market segments. However, considering each market segment, MIMS and AIMS, there

is no statistical difference between capital structure and the control variables in the market segments.

5.3 Conclusion

The findings from the study have various implications for firms listed at the NSE. One key takeaway was that corporate governance plays a critical role in capital structure. The study implies that firms can reduce leverage by considering their boards' constitutions.

Firms with fewer board members than the average should consider relooking at the number of board members. The study showed a reduction in leverage due to increased board members. Therefore, more board members have been shown to improve the capital structure for firms in both market segments.

For firms in both the MIMS and AIMS market segments, their perceived risk in terms of leverage can be reduced by increasing the representation of women on boards. As the results have shown, having gender diversity on the firms' boards has led to reduced leverage.

Finally, regarding corporate governance and board structure, the study has shown that firms need to incorporate more independent directors onto their boards. The study showed a positive capital structure improvement, with boards with more independent directors having less leverage in the MIMS and AIMS market segments.

Further, the study implies that firms and stakeholders need to consider other factors such as profitability, size, growth, non-debt tax shield, earnings volatility and tangibility. These factors, combined with the board structure, affect the firm's capital

structure. Therefore, the control factors should not be ignored when making informed decisions on firms listed on the NSE in both MIMS and AIMS market segments.

5.4 Recommendations

From the study, it is recommended that firms should consider increasing their board size. Most firms in the AIMS market segment, in particular, should consider increasing their board size as they have fewer board members on average than firms in the MIMS market segment. The study showed that an increase in board size would lead to reduced leverage and thus improve their capital structure.

The study recommends that firms increase diversity in their boards regarding women. The research has shown that firms with more women on their boards have reduced leverage. Further, firms in the AIMS market segment should consider increasing the number of women on their boards as they lag behind the MIMS market segment on average.

The research has shown that firms should incorporate more independent directors into their boards. The increase in independent directors is shown to reduce firms' leverage levels. Further, for firms in the AIMS market segment, it is recommended that they should focus on increasing independent directors as they are fewer than in the MIMS market segment.

The study recommends that a firm's profitability be considered in capital structure decisions. The study has shown a positive relationship between capital structure and profitability. Therefore, decision-makers to consider a firm's profitability when structuring capital allocation targets.

The study recommends that large firms should consider increasing their levels of leverage. The study has shown a negative relationship between size and capital structure in both market segments. The study has shown that larger firms have been taking lesser debt. However, the trade-off theory proposes that larger firms should utilise their stable cash flows to minimise opportunity costs of forgoing investments.

For firms in the AIMS market segment, the study recommends taking advantage of their growth opportunities. Firms in the AIMS market segment have, on average more growth opportunities than those in the MIMS segment.

5.5 Limitations of the Study

The first limitation of the study was that no firm listed at the NSE reported having board members representing minority shareholders. Minority shareholder representation was one of the variables intended for study. However, firms have not adopted this practice in Kenya. Therefore, the variable had to be dropped from the final model.

Another limitation of the study was that although there were firms under liquidation, they were still listed on the NSE. The firms had entered into liquidation in prior years and were not publishing financial statements throughout the study period. Therefore, the firms had to be dropped from the study sample.

There was a limitation on the study period due to the covid pandemic. The study looked at firms listed at the NSE from 2015 to 2019. There is a need for sufficient observations post-2020 for the effects of the pandemic to be empirically determined.

The residuals from the regression model showed that they do not follow a normal curve. Therefore, there is a limitation on how well the model can fit the data and make predictions.

There is a limitation on how the variables are specified. In the linearity tests, a few variables did not show strong linearity. Therefore, the variables would need to be transformed to conform to the requirements of the regression model.

5.6 Suggestions for Further Research

Board structure is just one aspect of corporate governance. Other corporate governance factors include the remuneration of board members and composition of committees, among others. One suggestion for further research is, other than board structure, there is need to incorporate other aspects of corporate governance. Although the model explained a seventy-eight per cent variation in capital structure, other aspects of corporate governance could enhance the model's performance further.

Further research could be done using alternative econometric models, such as non-linear regression models. Other tools and models that could best fit leptokurtic curves could be used to fit the data and make predictions.

There could be further research on transformed variables using various statistical techniques such as differencing or taking natural logs of the variables to cure for non-linearity and see the effect of the transformations.

As financial institutions were excluded from the sample due to their high regulation of capital structure, further research can be conducted to establish whether the current capital structures are optimal for the firms.

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APPENDICES

Appendix 1: Sampled Firms And Research Data

Table 7: Sampled Firms And Research Data

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
WPP Scangroup Plc	1	2015	2%	7	0	0	43%	57%	23.54	61%	1%	3%	4%	MIMS
WPP Scangroup Plc	1	2016	2%	7	0	0	43%	54%	23.51	111%	1%	0%	3%	MIMS
WPP Scangroup Plc	1	2017	3%	9	0	11%	44%	46%	23.37	131%	1%	3%	2%	MIMS
WPP Scangroup Plc	1	2018	6%	9	0	11%	44%	52%	23.35	119%	1%	5%	3%	MIMS
WPP Scangroup Plc	1	2019	0%	9	0	11%	33%	39%	22.95	139%	2%	8%	2%	MIMS
TPS Eastern Africa	2	2015	27%	11	0	9%	64%	6%	22.55	158%	3%	2%	69%	MIMS
TPS Eastern Africa	2	2016	39%	11	0	9%	64%	10%	22.59	244%	3%	3%	66%	MIMS
TPS Eastern Africa	2	2017	49%	10	0	10%	60%	9%	22.58	231%	2%	3%	74%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
TPS Eastern Africa	2	2018	52%	10	0	10%	60%	9%	22.61	167%	2%	1%	75%	MIMS
TPS Eastern Africa	2	2019	46%	8	0	13%	63%	11%	22.64	243%	2%	1%	75%	MIMS
Standard Group Plc	3	2015	85%	8	0	13%	63%	0%	22.22	28%	9%	3%	47%	MIMS
Standard Group Plc	3	2016	72%	8	0	13%	63%	0%	22.30	36%	10%	4%	42%	MIMS
Standard Group Plc	3	2017	76%	9	0	22%	56%	0%	22.26	29%	10%	1%	40%	MIMS
Standard Group Plc	3	2018	63%	9	0	22%	33%	0%	22.30	37%	7%	0%	39%	MIMS
Standard Group Plc	3	2019	75%	8	0	25%	38%	0%	22.13	28%	8%	6%	39%	MIMS
Sameer Africa Plc	4	2015	22%	6	0	0%	50%	14%	21.9	172.2%	5%	8%	8%	MIMS
Sameer Africa Plc	4	2016	45%	7	0	14%	29%	-24%	21.8	223.5%	4%	16%	3%	MIMS
Sameer Africa Plc	4	2017	32%	6	0	50%	50%	-28%	21.7	249.2%	3%	3%	12%	MIMS
Sameer Africa Plc	4	2018	86%	8	0	38%	50%	-21%	21.4	156.1%	3%	6%	14%	MIMS
Sameer Africa Plc	4	2019	1259%	7	0	43%	57%	330%	21.3	8.3%	6%	14%	4%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Nation Media Group Plc	5	2015	0.6%	16	0	19%	81%	39%	23.24	12%	5%	1%	27%	MIMS
Nation Media Group Plc	5	2016	0.1%	14	0	14%	79%	39%	23.15	14%	5%	2%	26%	MIMS
Nation Media Group Plc	5	2017	0.1%	15	0	13%	80%	34%	23.09	19%	5%	2%	27%	MIMS
Nation Media Group Plc	5	2018	0.1%	15	0	7%	80%	15%	22.99	21%	5%	7%	23%	MIMS
Nation Media Group Plc	5	2019	0.2%	14	0	14%	79%	27%	22.93	38%	6%	15%	19%	MIMS
Kenya Airways Ltd	6	2015	- 2478%	16	0	19%	81%	- 223%	25.43	-58%	7%	0%	69%	MIMS
Kenya Airways Ltd	6	2016	-400%	13	0	23%	85%	-40%	25.48	-596%	5%	0%	76%	MIMS
Kenya Airways Ltd	6	2017	- 3520%	14	0	21%	86%	- 498%	25.33	-6%	5%	0%	75%	MIMS
Kenya Airways Ltd	6	2018	- 3317%	13	0	23%	92%	- 646%	25.46	-4%	7%	2%	73%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Kenya Airways Ltd	6	2019	-425%	12	0	25%	92%	- 197%	25.57	-85%	10%	5%	46%	MIMS
Eveready East Africa Ltd	7	2015	48%	7	0	71%	43%	-20%	20.84	79%	3%	9%	54%	MIMS
Eveready East Africa Ltd	7	2016	91%	7	0	57%	43%	-40%	20.13	110%	145%	6%	2%	MIMS
Eveready East Africa Ltd	7	2017	1%	7	0	57%	43%	47%	19.64	107%	127%	34%	1%	MIMS
Eveready East Africa Ltd	7	2018	3%	6	0	50%	33%	-37%	19.34	134%	74%	68%	1%	MIMS
Eveready East Africa Ltd	7	2019	12%	6	0	67%	33%	-94%	19.07	55%	69%	36%	2%	MIMS
B.O.C Kenya Plc	8	2015	4%	6	0	50%	33%	16%	20.89	69%	3%	1%	33%	MIMS
B.O.C Kenya Plc	8	2016	4%	8	0	38%	63%	9%	20.80	97%	3%	6%	35%	MIMS
B.O.C Kenya Plc	8	2017	8%	8	0	38%	63%	16%	20.69	92%	4%	7%	36%	MIMS
B.O.C Kenya Plc	8	2018	7%	8	0	38%	63%	5%	20.69	82%	4%	9%	37%	MIMS
B.O.C Kenya Plc	8	2019	3%	8	0	38%	63%	7%	20.70	113%	5%	6%	39%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
British American Tobacco Kenya Plc	9	2015	20%	9	0	33%	67%	72%	24.30	13%	6%	15%	75%	MIMS
British American Tobacco Kenya Plc	9	2016	20%	9	0	33%	67%	99%	24.33	11%	6%	20%	78%	MIMS
British American Tobacco Kenya Plc	9	2017	16%	9	0	44%	56%	92%	24.26	10%	7%	19%	81%	MIMS
British American Tobacco Kenya Plc	9	2018	13%	8	0	38%	75%	83%	24.32	15%	4%	10%	73%	MIMS
British American Tobacco Kenya Plc	9	2019	2%	8	0	38%	75%	112%	24.41	20%	5%	15%	87%	MIMS
Unga Group Ltd	10	2015	12%	8	0	25%	88%	13%	23.65	161%	2%	2%	34%	MIMS
Unga Group Ltd	10	2016	8%	8	0	25%	88%	16%	23.71	225%	3%	0%	32%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Unga Group Ltd	10	2017	7%	8	0	25%	88%	39%	23.70	216%	3%	5%	28%	MIMS
Unga Group Ltd	10	2018	16%	8	0	25%	88%	2%	23.72	184%	4%	20%	32%	MIMS
Unga Group Ltd	10	2019	18%	8	0	25%	88%	18%	23.61	215%	4%	20%	35%	MIMS
Carbacid Investments Ltd	11	2015	0%	5	0	0	100%	25%	20.51	55%	2%	4%	33%	MIMS
Carbacid Investments Ltd	11	2016	0%	5	0	0	100%	17%	20.54	71%	2%	3%	32%	MIMS
Carbacid Investments Ltd	11	2017	0%	5	0	0	100%	15%	20.44	90%	4%	8%	52%	MIMS
Carbacid Investments Ltd	11	2018	0%	5	0	0	100%	11%	20.44	104%	3%	2%	49%	MIMS
Carbacid Investments Ltd	11	2019	0%	5	0	0	100%	18%	20.26	95%	3%	1%	40%	MIMS
East African Breweries Ltd	12	2015	253%	9	0	33%	44%	129%	24.89	5%	6%	11%	55%	MIMS
East African Breweries Ltd	12	2016	245%	8	0	25%	38%	203%	24.89	5%	6%	3%	58%	MIMS
East African Breweries Ltd	12	2017	234%	11	0	27%	55%	145%	24.98	6%	5%	11%	56%	MIMS
East African Breweries Ltd	12	2018	267%	11	0	27%	55%	148%	25.02	7%	5%	4%	64%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
East African Breweries Ltd	12	2019	225%	10	0	30%	60%	164%	25.14	10%	4%	7%	61%	MIMS
Umeme Ltd	13	2015	95%	9	0	22%	56%	57%	24.28	2%	4%	0%	26%	MIMS
Umeme Ltd	13	2016	119%	10	0	20%	60%	51%	24.34	2%	4%	4%	24%	MIMS
Umeme Ltd	13	2017	107%	13	0	15%	77%	73%	24.47	2%	5%	6%	23%	MIMS
Umeme Ltd	13	2018	73%	10	0	20%	70%	81%	24.44	4%	4%	0%	29%	MIMS
Umeme Ltd	13	2019	67%	11	0	18%	82%	60%	24.62	6%	5%	6%	35%	MIMS
Total Kenya Ltd	14	2015	41%	7	0	29%	43%	57%	25.65	57%	13%	62%	26%	MIMS
Total Kenya Ltd	14	2016	38%	7	0	29%	43%	33%	25.43	33%	15%	41%	25%	MIMS
Total Kenya Ltd	14	2017	33%	7	0	29%	43%	8%	25.64	8%	14%	1%	25%	MIMS
Total Kenya Ltd	14	2018	32%	7	0	29%	43%	59%	25.64	59%	15%	30%	26%	MIMS
Total Kenya Ltd	14	2019	16%	7	0	29%	43%	6%	25.69	6%	16%	42%	29%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Kenya Power & Lighting Co Plc	15	2015	189%	9	0	11%	67%	60%	25.39	176%	3%	1%	72%	MIMS
Kenya Power & Lighting Co Plc	15	2016	174%	9	0	22%	67%	54%	25.41	323%	3%	3%	79%	MIMS
Kenya Power & Lighting Co Plc	15	2017	193%	9	0	33%	67%	63%	25.52	444%	4%	2%	79%	MIMS
Kenya Power & Lighting Co Plc	15	2018	176%	9	0	33%	67%	68%	25.56	506%	5%	0%	81%	MIMS
Kenya Power & Lighting Co Plc	15	2019	198%	9	0	44%	67%	78%	25.61	480%	5%	0%	84%	MIMS
KenGen Co. Plc	16	2015	104%	11	0	27%	64%	13%	24.12	251%	3%	5%	95%	MIMS
KenGen Co. Plc	16	2016	79%	11	0	27%	36%	23%	24.38	385%	3%	4%	87%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
KenGen Co. Plc	16	2017	76%	11	0	36%	64%	12%	24.49	347%	3%	7%	86%	MIMS
KenGen Co. Plc	16	2018	69%	11	0	27%	64%	15%	24.54	374%	3%	5%	86%	MIMS
KenGen Co. Plc	16	2019	72%	11	0	36%	64%	21%	24.55	494%	3%	1%	86%	MIMS
E.A.Portland Cement Co. Ltd	17	2015	38%	7	0	0%	57%	1%	22.85	2%	3%	38%	38%	MIMS
E.A.Portland Cement Co. Ltd	17	2016	32%	7	0	0%	57%	6%	22.91	2%	6%	30%	30%	MIMS
E.A.Portland Cement Co. Ltd	17	2017	35%	7	0	0%	43%	-3%	22.66	3%	7%	31%	31%	MIMS
E.A.Portland Cement Co. Ltd	17	2018	25%	7	0	14%	43%	-4%	22.37	1%	4%	21%	21%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
E.A.Portland Cement Co. Ltd	17	2019	32%	7	0	0%	43%	-5%	21.77	1%	1%	20%	20%	MIMS
E.A.Cables Ltd	18	2015	99%	7	0	0%	71%	12%	22.04	85%	3%	16%	47%	MIMS
E.A.Cables Ltd	18	2016	169%	7	0	0%	71%	34%	22.02	157%	4%	9%	54%	MIMS
E.A.Cables Ltd	18	2017	206%	6	0	0%	33%	22%	21.58	130%	4%	8%	54%	MIMS
E.A.Cables Ltd	18	2018	269%	8	0	13%	25%	40%	21.21	136%	4%	6%	57%	MIMS
E.A.Cables Ltd	18	2019	130%	8	0	13%	38%	17%	21.18	300%	4%	5%	43%	MIMS
Crown Paints Kenya Plc	19	2015	114%	7	0	14%	43%	69%	22.63	35%	3%	10%	26%	MIMS
Crown Paints Kenya Plc	19	2016	106%	6	0	0%	50%	69%	22.72	46%	3%	5%	24%	MIMS
Crown Paints Kenya Plc	19	2017	112%	6	0	0%	50%	57%	22.72	43%	2%	3%	22%	MIMS
Crown Paints Kenya Plc	19	2018	252%	6	0	0%	50%	115%	22.84	17%	3%	5%	27%	MIMS
Crown Paints Kenya Plc	19	2019	166%	5	0	0%	40%	123%	22.88	23%	4%	4%	28%	MIMS



companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Bamburi Cement Ltd	20	2015	1%	9	0	22%	33%	27%	24.39	56%	4%	1%	54%	MIMS
Bamburi Cement Ltd	20	2016	1%	9	0	0%	33%	19%	24.36	44%	4%	5%	52%	MIMS
Bamburi Cement Ltd	20	2017	9%	8	0	38%	50%	20%	24.31	53%	4%	5%	69%	MIMS
Bamburi Cement Ltd	20	2018	17%	11	0	36%	45%	14%	24.34	53%	4%	5%	72%	MIMS
Bamburi Cement Ltd	20	2019	16%	11	0	36%	45%	17%	24.33	72%	5%	5%	71%	MIMS
Sasini Plc	21	2015	0%	8	0	13%	13%	2%	21.75	373%	1%	1%	55%	MIMS
Sasini Plc	21	2016	0%	8	0	13%	13%	4%	22.00	295%	1%	3%	52%	MIMS
Sasini Plc	21	2017	1%	7	0	14%	14%	-1%	22.16	185%	1%	4%	67%	MIMS
Sasini Plc	21	2018	0%	8	0	25%	38%	4%	21.98	216%	1%	6%	67%	MIMS
Sasini Plc	21	2019	1%	8	0	25%	38%	-2%	21.75	388%	1%	7%	78%	MIMS
Kakuzi Plc	22	2015	0%	7	0	0%	43%	23%	21.63	58%	3%	3%	48%	MIMS
Kakuzi Plc	22	2016	0%	8	0	0%	38%	22%	21.70	65%	3%	3%	46%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Kakuzi Plc	22	2017	0%	8	0	0%	38%	25%	21.76	75%	3%	2%	42%	MIMS
Kakuzi Plc	22	2018	0%	8	0	0%	38%	12%	21.87	74%	3%	9%	46%	MIMS
Kakuzi Plc	22	2019	0%	7	0	0%	43%	19%	21.78	86%	3%	12%	45%	MIMS
Car & General (K) Ltd	23	2015	93%	7	0	0%	57%	13%	23.02	182%	1%	7%	12%	MIMS
Car & General (K) Ltd	23	2016	108%	7	0	0%	71%	-5%	23.00	226%	1%	9%	15%	MIMS
Car & General (K) Ltd	23	2017	106%	7	0	0%	86%	20%	22.99	419%	1%	11%	15%	MIMS
Car & General (K) Ltd	23	2018	125%	7	0	0%	86%	17%	23.03	423%	1%	7%	15%	MIMS
Car & General (K) Ltd	23	2019	129%	7	0	0%	86%	10%	23.20	356%	1%	1%	14%	MIMS
Safaricom Plc	24	2015	10%	9	0	44%	22%	68%	25.82	260%	14%	13%	69%	MIMS
Safaricom Plc	24	2016	0%	9	0	44%	22%	71%	26.00	291%	16%	2%	71%	MIMS
Safaricom Plc	24	2017	15%	9	0	33%	22%	96%	26.08	268%	21%	10%	72%	MIMS
Safaricom Plc	24	2018	3%	10	0	30%	20%	91%	26.18	309%	20%	6%	73%	MIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Safaricom Plc	24	2019	3%	10	0	30%	20%	86%	26.25	360%	18%	2%	65%	MIMS
Williamson Tea Kenya Ltd	25	2015	4%	7	0	0%	43%	3%	21.68	557%	2%	8%	26%	AIMS
Williamson Tea Kenya Ltd	25	2016	3%	7	0	0%	43%	15%	21.94	221%	3%	6%	22%	AIMS
Williamson Tea Kenya Ltd	25	2017	3%	7	0	0%	43%	11%	21.95	189%	4%	9%	43%	AIMS
Williamson Tea Kenya Ltd	25	2018	1%	7	0	0%	43%	9%	22.11	270%	3%	3%	42%	AIMS
Williamson Tea Kenya Ltd	25	2019	1%	7	0	0%	43%	25%	21.93	264%	6%	8%	44%	AIMS
Kapchorua Tea Co. Ltd	26	2015	1%	7	0	0%	43%	3%	20.79	281%	3%	13%	26%	AIMS
Kapchorua Tea Co. Ltd	26	2016	1%	7	0	0%	43%	15%	20.91	262%	4%	3%	20%	AIMS
Kapchorua Tea Co. Ltd	26	2017	1%	7	0	0%	43%	20%	20.98	232%	6%	5%	45%	AIMS
Kapchorua Tea Co. Ltd	26	2018	3%	7	0	0%	43%	8%	21.08	305%	4%	6%	41%	AIMS
Kapchorua Tea Co. Ltd	26	2019	3%	7	0	0%	43%	45%	21.07	313%	8%	21%	45%	AIMS
The Limuru Tea Co. Plc	27	2015	0%	4	0	0%	25%	17%	11.71	20%	10%	4%	46%	AIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
The Limuru Tea Co. Plc	27	2016	0%	4	0	0%	25%	18%	11.55	11%	9%	0%	47%	AIMS
The Limuru Tea Co. Plc	27	2017	0%	5	0	40%	40%	19%	11.29	13%	9%	1%	45%	AIMS
The Limuru Tea Co. Plc	27	2018	0%	8	0	50%	38%	9%	11.60	16%	6%	5%	39%	AIMS
The Limuru Tea Co. Plc	27	2019	0%	6	0	67%	50%	7%	11.42	18%	6%	4%	39%	AIMS
Express Kenya Plc	28	2015	154%	5	0	0%	20%	4%	18.63	339%	5%	24%	75%	AIMS
Express Kenya Plc	28	2016	867%	5	0	0%	20%	30%	17.96	65%	5%	7%	74%	AIMS
Express Kenya Plc	28	2017	-368%	4	0	0%	25%	47%	17.73	-190%	5%	8%	73%	AIMS
Express Kenya Plc	28	2018	-238%	4	0	0%	25%	46%	17.09	-387%	6%	0%	76%	AIMS
Express Kenya Plc	28	2019	918%	4	0	0%	25%	-37%	16.82	62%	5%	18%	80%	AIMS
Longhorn Publishers Plc	29	2015	14%	8	0	38%	38%	6%	20.56	21%	3%	6%	26%	AIMS
Longhorn Publishers Plc	29	2016	52%	8	0	38%	38%	-53%	21.13	70%	2%	24%	12%	AIMS
Longhorn Publishers Plc	29	2017	36%	9	0	33%	33%	30%	21.10	70%	2%	69%	12%	AIMS

companyName	Id	Year	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Market Segment
Longhorn Publishers Plc	29	2018	56%	9	0	22%	33%	48%	21.25	89%	2%	33%	9%	AIMS
Longhorn Publishers Plc	29	2019	35%	9	0	22%	33%	12%	21.19	58%	2%	18%	8%	AIMS



30/11/2022

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29.11.2022

by Kennedy Mbuthia


General metrics

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