Journal of Finance and Investment Analysis, Vol. 14, No. 4, 2025, 1-37
ISSN: 2241-0988 (print version), 2241-0996 (online)
https://doi.org/10.47260/jfia/1441
Scientific Press International Limited

Capital Structure and Market Value of Non-Financial Firms Listed at Nairobi Securities Exchange in Kenya

Onyango Collins Omondi[1], Nixon Omoro[1] and Luther Otieno[1]

Abstract

This study sought to address the two variable research entitled, "Capital structure and market value of non-financial firms listed at NSE in Kenya. Variables outlay was Capital structure as an independent variable and market value as the dependent variable, which was aimed at addressing the two key objectives; "to establish the effect of capital structure on market value of non-financial firms listed at Nairobi Securities Exchange. The research was based on quantitative approach applying panel data collected from NSE with a population of 32 firms culminating to 320 observations over ten years from 2012-2021. A quantile regression model was applied to test the hypothesis, with the results showing varied outcomes. First, the result showed a significant relationship between capital structure and firms' value under hypothesis one. Finally, the findings could authoritatively be recommended for adoption by stakeholders for making financial management decisions like merger and acquisition, balancing of debt and equity in the capital structure taking into consideration interest rate trends, trading off of debts or investing in new ventures as a result of the availability of cost-effective finances. The result equally can be specifically extended further to; government policymakers, scholars and non-financial sector managers who would find the findings applicable in their areas of specialty besides learning from the challenges addressed at the end of this study.

Keywords: Schwarz's inequality, Triangle inequality.

[1] University of Nairobi, Department of Finance and Accounting.

Article Info: *Received:* October 24, 2025. *Revised*: November 25, 2025.
Published online: December 1, 2025.

1. Introduction

Capital structure, interest rate sensitivity and firms' market value possess interrelationships that guide management towards maximizing shareholders' wealth, in this case, working towards increasing firms' market against invested assets in a market environment characterized by volatile interest rate risk. Capital structure is further broken down to include debt capital, equity capital, and, to some extent, shareholder-own savings, a combination determined by firms' managers in varied ratios based on available investment opportunities and underlying financial risk factors (Modigliani & Miller, 1963). However, balancing off of components of capital structure has been tied to the volatility of prevailing market interest rate as such rates lead managers on whether to prefer more debt to equity, short-term borrowing to long-term borrowing, or to invest or disinvest shareholders' wealth in profitable available investment opportunities. Further, it is argued that demand for finances to satisfy the transitionary or precautionary investments varies from firm to firm, as explained by (Keynes, 1960).

In liberalized markets like the United States of America, studies confirm that firm managers carefully manage agency conflicts by making informed investment decisions by trying to balance off equity and debt in capital structure, considering interest rate dynamics aimed at improving market value performance (Yustisiana, 2020). However, depending on the nature of the industry and management's appetite for leverage, an additional study article proved that an uncontrolled increase in debt capital in the structure of capital considering interest rate volatility at a specific time might trigger a negative change in the firm's value as a result of an increase in expenses associated with the raising of such debts (Staking & Babbel, 1995). Nadeem and Zongjun (2012) study pointed out that financial managers are key and critically informed decision makers in determining cost cost-effective ratio between borrowings to owners' share capital in a corporation's aggregated capital structure that would guarantee firm's positive market value in that any nontactical financial decisions made by the same managers may lead to detrimental performance.

Kenya has not been an exception equally based on firms' value performance and structure of capital in an interest rate volatile environment, a related study which ended up with a non-absolute confirmation that, indeed, firms' performance portrayed a significant relationship across different sectors (Njoroge, 2013). However, in Africa, financial liberalization and interest rate risk management in sub-Saharan Africa equally had remained a non-concluded challenge since not all countries and structured markets were considered (Willem, 1995). Despite several scholars carrying out research on optimum capital structure and market values, financial managers have never absolutely resolved the puzzle of optimality of capital structure alongside interest rate risk as an intervening variable factor, a justification for further academic exploration as considered in this study (Brealey & Myers, 1988 & Nejadmalayeri, 2000).

Several theories have been brought up by various scholars trying to explain factors

that are key to realizing optimal capital structure, which in turn may lead to maximizing firms' value. To begin with, (Modigliani & Miller, 1963) affirms that the capital structure ratio has an effect on the market value of the firm since tax advantage derived from debt capital reflects higher residual income immediately after paying off debt holders as it is adjusted as an expense in arriving at net operating profit which is finally attributable to shareholders. In a different scenario, the trade-off theory (Fama & French, 1998) explains the importance of firms' value and growth through debt management prudence and the risks of its exposure to the firm upon its excessive use in capital structure composition. A prominent feature considered by the theory states that because of the deductibility of interest rate expense, the thirstier the firm is in raising debt capital, the lower the tax expense up to some extent, and the higher the stock market value upon which a further debt absorption leads to firms incurring losses as a result of inability to cover the cost of excess borrowing.

The scholars argued that as long as debt is prioritized over equity, a firm's value would remain favorable. Myers (1984), in their view of the pecking order theory, fairly considers optimality about holistic capital structure as a startup stage but rather argues that firms under the going concern concept empirically consider internal reserves before looking into the slots of both equity and debt in the structure of capital. Under normal circumstances, the scholar confirms that firm managers would prefer debt over equity, which is deemed to be cost-effective under the going concern.

Brealey and Myers (1988) Net operating income theory does not fully concur with the traditional theories and argues that because the firm's market value is pegged on its market risks and net operating income associated with it, the firm's value will always remain the same. Finally, the market-timing theory (Ross, 1977) eluded the fact that profitable stock market value would be determined at a time when management monitors the interest rate dynamics within the trading market and takes precautionary measures by investing or disinvesting in profitable stocks within a reasonable time as the interest rate keeps on changing. Jensen and Meckling (1976), on the contrary, confirm that under agency theory, managers stand a better chance to balance off capital ratio by analyzing prevailing risks as they carry out delegated investment roles on behalf of the shareholders and must ensure that such shareholders' funds are invested on profitable ventures otherwise the managers may risk losing their stewardship assignment when shareholders realize that their interests are not served well. However, the agency's role depends on how effectively shareholders supervise managers.

Non-financial firms, which are firms other than the banking sector and insurance sector listed at NSE, have been identified due to a liberalized trading platform that does not warrant the sector to conform to the Central Bank of Kenya's stringent measures This liberty, therefore, exposes these firms to experience dynamic capital structures access as interest rate fluctuates from time to time. In addition, this sector is of great importance in Kenya as it contributes a lot to the economic growth in terms of GDP, especially towards achieving the long-term vision of

industrialization set to be realized by the year 2030. Complimentarily, the sector contributes to economic development through the generation of national wealth, sovereign power, economic growth, international trade and job creation. In line with quality and reliable data, NSE facilitates the provision of secondary financial data that clearly addresses interest rate sensitivity, capital structure, and market values of the trading firms.

Similarly, global effects had been witnessed in the United States of America (NYSE, 2017) where it witnessed an alarming rate of drop of firms from 46 in 2014 to 26 in the succeeding year due to capital structure conditions of the US government a characteristic equally witnessed in Indonesia when the bank of Indonesia was forced to issue an order to guarantee banking sector stock market value stability by issuing a seven days' temporary reverse interest rate to reduce the risk associated with borrowing at unfavorable annual interest rate (Wulandari & Harjito, 2021).

1.1.1 Capital Structure

Myers (1984) defines a capital structure to be a financial blend comprising equity capital and debts utilized by firms in financing available investment opportunities geared towards maximizing shareholders' wealth. He further considers managers to be critical in determining the balanced capital structure by weighing off the changes in the interest rate and its effect on debt borrowing alongside returns expected from shareholders, which further determines the stability of the firm's structure of capital, shareholders' confidence, and management tenure. In a different definition, (Copeland & Weston, 1988) explain capital structure as "funds for investment provided to the firm by investors who hold various types of claims on the firm's cash flows."

Titman and Grinblatt (1989), in a different dimension, highlight their definition, which explains that companies categorize sources of capital structure as either internal or external, where internal sources are finances raised from accumulated earnings, whereas external sources are raised from debt and equity financiers, respectively.

However, separate from the definitions highlighted, (Saad, 2010) showed that a well-balanced capital structure enables the financing of investments via debt financing, equity financing, or a combination of the two, which ultimately determines the firm's value. Finally, in determining the clear distinction of a firm's characteristics, a firm that has only "equity capital," which is the only financing avenue, is referred to as an unlevered firm, whereas the one financed by the aggregate of equity and debt capital is referred to as a levered firm. Such choices are unique and vary from one firm to the other, considering their level of growth, size, and available investment opportunities (Ahmadpour & Yahyazadehfar, 2010).

As a major variable in line with the adopted definition by (Mayers, 1984), a clear and distinctive approach is necessary to measure the components of sources of financing, which include borrowing and shareholders' contributions. In this case,

capital structure will be measured using the ratio of total liability over total assets and total equity over total assets. Staking and Babbel (1995) also applied this measurement method in their previous academic research and proved it useful in their findings besides the formula's ability to consider all the structures of capital parameters.

1.1.2 Market Value

Leland and Toft (1991) describe a firm's market value as the aggregate of assets' value and tax advantage derived from borrowed debt adjusted against applicable bankruptcy costs at a particular time. They elaborated their scholarly argument to include the price that a company stock would be traded on in a competitive market. Scholarly work, as postulated by (Ehrhardt & Bringham, 2003), defines a firm's market value as the total sum of claimants' claims, that is, debt holders' proportion and equity holders' proportion within the capital structure, respectively. An increase in a firm's market value is crucial since it is followed by motivation to invest or not by potential investors. Over time, various investors scavenge, looking into a firm's financial performance information across the available liberalized markets, where potential investors would always be ready to offload or buy stocks from firms that show indications of better investment returns. In this case, firms characterized by negative stock values tend to have shareholders switching to more prospective firms with the certainty of better positive returns on investment.

Nassar (2016) states that the "measure of a firm's market value can be derived by applying one amongst the stated measurement techniques that include returns on invested equity, returns on investment, EPS alongside market capitalization." These techniques are very critical, and financial decision-makers should be aware of their individual outcome before making informed investment decisions that would guarantee higher firm value. Specifically, monitoring a firm's value would help managers track the trend of firm performance in line with profitability, growth potential, and risk preparedness. This positions managers early enough to make management strategic decisions, e.g., merger or acquisition decisions, besides working towards shareholders' interests. A good measure will also inform investors in making informed decisions associated with bond pricing, risk mitigation, perception, and assessment of the attractiveness of varied sectors' bond values. This research will, therefore, adopt market capitalization (Current market price per share times total number of outstanding shares) as a measure of firms 'market value.

1.1.3 Non-Financial Firms Listed at Nairobi Securities Exchange

Nairobi Securities Exchange has been identified as one of the institutions legally mandated to facilitate stock trading and regulation of the same in Kenya. It was incorporated under the Societies Act in 1954 to mean "Voluntary Association of Stockbrokers" (NSE, 2021). It is currently mandated to facilitate trading platforms dealing with equity, bonds, and quasi-equity with a population of sixty-three listed companies categorized in fourteen sectors. Due to its organization, NSE will make

it possible to access data related to interest rates, structure of capital, and identified firms' market values because of guarantees on data validity and reliability. The listed firms meant for this research shall exclude the insurance (6) and banking (12) sectors, leaving this research to focus on the outstanding forty-five, herein referred to as non-financial firms (NSE, 2021). Further breakdown lists these firms into nine sectors, namely: agricultural, automobile and accessories, commercial and services, construction and allied, energy and petroleum, investment services, manufacturing and allied, telecommunications and technology, and real estate

This sector has been identified due to the liberalized trading platform, which means that their capital structure does not need to conform to the Central Bank of Kenya's stringent measures. This liberty, therefore, exposes these firms to experience dynamic capital structures as interest rate fluctuates. In addition, this sector is of great importance in the Kenyan context because it has a lot to contribute to the economy, especially towards achieving the long-term vision of industrialization objectives by the year 2030, facilitates economic development through the generation of national wealth, sovereign power, economic growth, international trade and finally contribution to job creation. The market contributes a lot in educating members of the public on investment considerations, regulating companies, providing market reports, which is very important for this research, and finally, providing financial solutions to common problems through trading in shares and bonds.

Finally, there has been a decline in registered non-financial institutions in NSE due to financial management challenges majorly emanating from mismanagement of capital structure, poor management of interest rate changes, and unsound financial management that led to insufficient market capitalization and unfavorable business environment, which led to low stock value from 2012 to 2021. As a result, a number of firms faced the CMA axe and became delisted, e.g., Marshals East Africa Limited, A. Baumans, and Hatchings Biemer. In addition, among the list of suspended firms are Uchumi Supermarket Limited, ARM Cement Co. Ltd, and Mumias Sugar Company KQ, among others (CMA, 2020). These scenarios have shown a detrimental performance of the Kenyan economy despite being tagged as the major contributors to the economy, as discussed earlier.

1.2 Research Problem

A related variable perspective (Staking & Babbel, 1995) found that the management of capital structure composition is associated with firms' market value and interest rate risks as a moderator. They found out that as interest rate risks increased, so did the immediate reduction in equity market value. Further (Admati et. al., 2018), the "Leverage ratchet effect" tested the agility and pervasiveness of shareholders' appetite towards balancing debt over equity in the capital structure and found that when leverage was adjusted against interest rate sensitivity, pure recapitalization that involved selling and buying of debt and equity in a liberalized market could guarantee the stability of firms' value. Bhattacharya (1988) explains

that inflation, leverage, and stock market variations react in a contrasting manner, in that markets where stocks were traded revealed that defaultless, risk-free debts of a long-term nature were not affected as a result of an increase in interest rates while the same was witnessed in markets with shocks on capital structure as they kept posting average incomes as he reviewed a two variables study, "capital structure and interest rate" of "legacy of Miller and Modigliani." (Yustisiana, 2020) study using two variables as well indicated that, "benchmark interest rate had a negative relationship with the stock market value of the construction listed firms." His article showed that if interest rates become sensitive, for example, increases, then the market stock prices would fall and vice versa, leading to dilution of firms' market value. In (Gordon & Shoven, 1982) looked into unexpected changes in interest rates, where they found that unexpected increases in interest rates could affect bond market prices, specifically bonds of a long-term nature. Additionally, (Ju & Yang, 2006) found that at a constant rate of interest rate, there was an effect on both optimal leverage and optimal debt maturity. Willem (1995) equally, looking into sub-Saharan African financial liberations using interest rate risk as an independent and not intervening variable, reported a positive relationship.

Kenyan perspective has seen several types of research undertaken related to this study, though they may not depict the specific variable as described herein. Ongweso (2006), applying two variables in the banking sector, researched on "interest rate and non-performing loans in Kenya" and found that there existed positive relationships between the two variables. However, addressing the independent variable as depicted by this research, considering two variables in his study, (Boyani, 2013) looked into the capital structure composition effect on the cost of capital on all firms listed at the Nairobi Securities Exchange, which included the non-financial sector, banking sector, and insurance sector. He, however, found a positive correlation between the study variables. Mwangi et. al. (2014) looked into a similar sector as per this study, with similar variables, except interest rate sensitivity had a negative effect on firms' performance when leverage kept on changing positively. Further, research by (Njoroge, 2013), which looked into two variables as well as the "effect of interest rate on financial performance considering all sectors listed at NSE," found a positive relationship between the variables.

Contextual review shows that several firms have in the recent past bowed out of business, with some facing close-downs, suspension, and, to the extreme, as a result of poor market valuation, got delisted from trading in stock markets across the world. Kenya has not been an exception too in this business distress condition, having witnessed the effect of interest rates on financial performance as a result of unfavorable capital structure, management's inability to control market interest rate risks, and poor market valuation. The theme of this study was destined to look into the Kenyan perspective, specifically on non-financial firms listed at NSE, and gauge the findings against these reviewed scholarly works.

Finally, based on the above-reviewed scholarly works, it is evident that relationships related to leverage and firms' market values do exist in various forms. Hardly did the reviews find two exact matching variables as per this research. Major

gaps also arose where scholarly works have majorly applied two variables in different phenomenon/ interchangeably.

Additionally, sectoral gaps evidently came out clearly as in all the reviewed journals in this chapter, none of them picked the non-financial sector with the exact number of variables. Further, different scholars addressing different or synonymous variables were unable to arrive at the same result due to the methods of analysis employed in running their research data. That is to say, the underutilization of the advanced econometric model is a methodological gap issue. For example, the use of basic regression can lead to biased estimates due to omitted variable bias, reverse causality, or measurement errors. This study improved on prior studies by employing more advanced econometric models such as GMM to control for possible endogeneity or fixed effect/Random effects model to account for both firm-specific and time-specific variations, quantile regression model to capture the dynamic interactions between capital structure interest rate sensitivity and market value of over time. Further, the quantile regression model is considered superb as it provides a more comprehensive analysis by considering all the variables' distribution despite the smaller or larger the spread may be within the quantile ranges and also robust where data may be skewed highly to the right or the left.

Therefore, failure to reach a convergent outcome reflected a research gap to be addressed by this study if the status quo would suffice. Finally, major reviewed journals depicted international and regional perspectives with no locally related studies covering the three matching variables as stated in this study. Therefore, a key question arises as to what relationships exist amongst capital structure, interest rate sensitivity, and market value of non-financial firms listed at the Nairobi Security Exchange in Kenya?

1.3 Research Objectives

This section discusses the general research objective stated as capital structure and market value of non-financial firms listed at the Nairobi Securities Exchange in Kenya.

1.3.1 General Objective

The general objective of this research was destined to determine the effect of capital structure on the market value of non-financial firms listed in the Nairobi Securities Exchange in Kenya.

1.3.2 Specific Objective

The specific objective of this document was:

To establish the effect of capital structure on the market value of non-financial firms listed at the Nairobi Securities Exchange.

1.4 Value of the Study

The study of capital structure and market value of non-financial firms portrayed varied results along the tested hypothesis H01. One of the tests revealed a significant relationship between capital structure and firm market value, which meant that managers' decision in considering a better mix of debt and equity ratio to finance possible investments which would guarantee higher firm value to shareholders. It's important to note that in doing so, the firm manager is in a critical position by pre-considering the best debt-to-equity ratio, financial flexibility by monitoring adverse leverage, debt earnings ratio to cushion against financial distress, prevailing tax rates, and ability to repay the debts/ liabilities when they fall due. Further, managers can employ turnaround strategies when cheaper debt capital becomes available over equity and refinance poorly performing functions within the firm, e.g., production, research, and development, or hedge by purchasing raw materials.

In addition, the stakeholder's main interest is to ever increase stock value by being speculative in both the bond and equity markets. They do keep scanning the market for possible profitable investment opportunities, that is, buying bonds at lower prices and selling them later at a higher value when the market interest rate becomes favorable or trading on bonds now when market prices favor the offloading of shares. It is equally important that potential investors do screen trading platforms like NSE and would be able to identify blue chip firms' stocks, hence switching investments across firms based on profitability indicators, in this case, firms' market value. Further, when the market is not promising better returns on investment, shareholders may wish to reinvest the returns by converting them to more shares, leading to higher firms' value. This may indicate deferred income or strategic refinancing of firms' investments by avoiding dilution of net disposable income. On the contrary, looking at the 10-year downward trend of reduction in interest rate all the way from 18% to 11%, bondholders may desist from trading in bonds or hoards until such a time interest rate returns to a profitable position by withdrawing bond subscriptions.

Key stakeholders, not limited to the government of Kenya and international financial regulators, would find this report's findings important in policy formulation that would facilitate a fair-trading platform advantageous to all players in the economy. As it has been realized from the hypothesis and analyzed data, the government would find it prudent to enhance the interest rate reduction further than it has been observed over the ten years margin to increase borrowings, enhance disposable income, and attract investments, which would in turn, create more job opportunities hence GDP growth. The wider parity between short-term and long-term rates would create a significant effect between capital structure and the value of the firms by allowing investors to take advantage of long-term borrowing, which is cheaper than short-term borrowing. Further, closer monitoring of the effect of interest rate sensitivity and capital structure mix could be achieved by having listed firms' board of directors, Kenya Revenue Authority, Central Bank of Kenya, and

NSE equally striking a balance on favorable interest rates capping that would not be costly to the potential shareholders within Kenya and remain competitively across the African region and internationally. If adopted, such efforts will see firms reporting favorable market value, which finally translates to long-term economic development.

Theoretically, findings are anticipated to be of great importance towards complementing the body of knowledge through critiquing the theories underpinning this study, complementing or disputing the published reviewed journals related to these theories, learning from the findings, gaps, and recommendations of this research, and gaining of more academic knowledge in finance discipline in line with the stated variables underlying this study. By extension, academicians who are interested in carrying out further research considering the same or related variables would continue with the gaps realized in this research, carry out the same research, and academically confirm reaching the same conclusions.

2. Literature Review

2.1.1 Modigliani and Miller Theory with Taxes

This theory was developed by (Modigliani & Miller 1963), whose paper has been in the limelight as one the landmark theories that tried to address the puzzle of optimal capital structure and firm value for a long period of time in the field of financial management. It considers relevant some of the decisions made by firm managers in trying to address the value of the firm as a result of financial investments made by shareholders. It further explains that managers in liberal financial markets under agency arrangements with the shareholders would wish to protect their stewardship responsibility by attempting to always go for financing opportunities that possess lower risk and promise high returns. In this case, shareholders would prefer retaining such managers as such an approach to their investments guarantees higher returns in the long run. The theory appreciates the leverage advantage emanating from tax deductibility, a saving that management considers advantageous towards dividend holders with net income after paying dividends eventually land to shareholders either inform of reserves or if not shared may be reinvested in the firms hence increase in stock holding. Further, according to the theory, the higher the firm becomes levered, the higher the market value as a result of tax advantage. This theory, by extension, has two offsetting effects on optimal capital structures: one, the deductibility of corporate interest payments, which pushes firms towards more target leverage, and two, the higher personal tax rate on debt relative to equity, which pushes them towards less leverage.

Miller and Scholes (1978), the personal tax rate implicit in the pricing of a firm's interest payments does not vary with its leverage at all proportions. If the marginal benefit of the corporate tax deduction is also constant at all levels of profit and loss, taxes do not produce an interior optimum for leverage. Whether taxes push a firm towards maximum leverage, no leverage, or indeterminate leverage depends on

whether the constant marginal corporate tax saving is greater than, less than, or equal to the constant marginal personal tax cost. However, (Baxter, 1976) did review MM theory by bringing in the concept of "bankruptcy costs" and their effects on highly levered firms. As a result, firms that were highly levered by taking advantage of favorable market interest rates uncontrollably would be characterized by higher costs of bankruptcy. According to (Shuetrim et. al., 1998), they identified challenges with one of the prepositions of MM theory and suggested in their findings that the application of firms' financial resources is always channeled to borrowings, shareholders' stake, and the government in the form of corporation taxes. To maximize the value of stocks, the management of such firms must reduce cash flows directed to the government, a concept which would see firms' value grow over time.

2.1.2 Pecking Order Theory

The theory was brought up by (Myers, 1984), who provides a different perspective in addressing capital structure optimality. At the same time, most of the scholars perceive capital structure to comprise only debt and equity. Myers explores additional streams of capital structure to include internally generated finances. He perceives the firm's management to take a totally different approach in an attempt to compose optimal capital structure by giving preference to retained earnings, which is perceived to be interest-free in a risk-averse condition. As a going concern, firm shareholders' agents would prioritize using excess profit in financing its available investment activities and would only resolve to external debt and equity capital as a last resort based on their interest rate risk status should there be a deficit. Jensen and Meckling (1976), on the contrary, confirm that under agency theory, managers stand a better chance to balance off the capital structure as they carry out delegated investment roles on behalf of the shareholders. However, the agency role depends on how effective shareholders supervise managers, and as such, agency theory crops in managerial effectiveness and management loyalty to shareholders in which there is a perfect relationship between the two, managers will always invest in a less risky type of capital which can guarantee positive firms value. Preceding Mayer's theory, another scholar argued that costs associated with external borrowing resemble "lemon premium" (Akerlof, 1970). As a result, his study ranks the financing sources of a firm beginning with retained earnings, followed by less risky debt capital, and finally, where necessary, the last preference is given to equity financing, respectively, a perspective geared towards increasing firm value.

2.1.3 Market Timing Theory

Ross (1977), who is behind the market timing theory, in his scholarly work, explains that firms time floatation of new shares when their prices are highly quoted in the trading markets. On the contrary, firms would repurchase these stocks when market trading is unfavorable, leading to an unfavorable drop in stock market value. He introduced signaling theory to finance, in which he suggested that managers could

use capital structure as well as dividends to give some signals about the firm's future proposals. More specifically, increasing the amount of debt in the capital structure mix can be assumed by outsiders to mean a sign of confidence in the market value of the firm. He argues that "management as stewards explicitly understands sharing of firm's income much more than the stockholders by giving priority to bondholders at the expense of shareholders' in that order".

Firms will reap much returns if stock value rises as a result of favorable interest rates in the market, but on the contrary, bankruptcy will penalize management, especially when prevailing market interest rate sensitivity becomes unfavorable. Baker and Wurgler (2002) argue that as a result of behaving irrationally (agent), the company stock value becomes mispriced. In this scenario, management tends to float stock at a time when their prices are irrationally lower and, at the same time, buy them back at a higher cost. Harvay (1995) found out that firm management appreciated the fact that timing the market interest rate movement in either way, that is, how it affects the pricing of stock market value, is key in making an informed decision whether to float or buy back the stock from the market.

2.2 Empirical Evidence

This section provides scholarly empirical evidence associated with this study. It looked into the various academic and research works that had been undertaken before and how they clearly relate to this research. In addition, the subsection broke down the analysis in this pattern: conceptual dimension, contextual consideration, applied methodology by various scholars, data analysis model, research findings, and study gaps.

2.3 Conceptual Framework

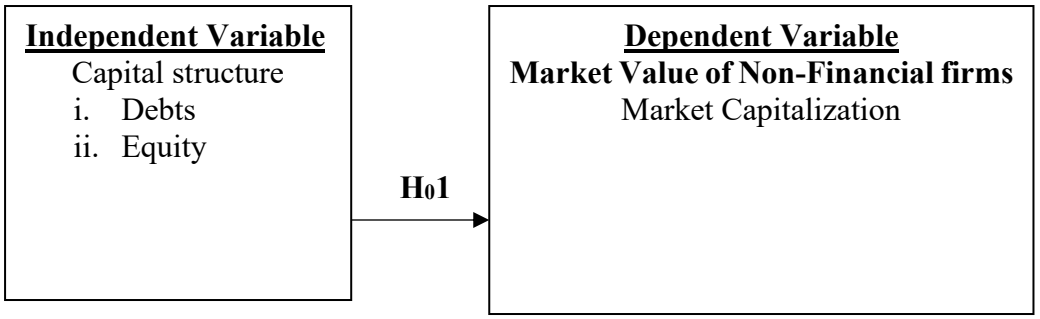

Figure 1: Conceptual Model

Source: Author, 2025

2.3.1 Research Hypothesis

The following formulated hypothesis was considered to guide this research study, namely:

$H_0$1: There is no significant relationship between capital structure and market value of non-financial firms listed at Nairobi Securities Exchange

3. Research Methodology

3.1 Research Philosophy

This research employed a positivist philosophy because of the quantitative nature of data touching on the three variables, namely capital structure, interest rate sensitivity, and market value of non-financial firms. Furthermore, it considers quantitative design that relies on a scientific approach that uses deductive reasoning. The scientific approaches start with investigative theories, followed by hypothesis formulation, and finally data collection, which are analyzed to deduce the findings of a phenomenon. In addition, the methodology involved hypothesis testing, whose findings of which ended up generalizing the tested phenomenon. A related study (Staking & Babbel, 1995) also applied positivist philosophy in their research on insurance firms when they looked into the relationship that existed amongst capital structure, interest rate sensitivity, and market value. Finally, the philosophy guided the independence and non-influence of secondary data that was collected for the purpose of this study, whose status guaranteed data reliability and authenticity.

3.2 Research Design

This research was carried out using a longitudinal research design, employing secondary quantitative data for a period of ten years. Cooper and Schindler (2003) describe a longitudinal study as one that is carried out repeatedly over an extended period of time, e.g., weekly, monthly, or annually, to determine their behaviors based on research objectives.

3.3 Population of the Study

The population under this study was considered through a census that involved forty-five (45) firms from different economic sectors herein referred to as non-financial firms, (NSE 2021) from 2012 to 2021 excluding insurance (6) and banking (12) sectors as they refer to a financial sector whose operations are regulated by Central bank of Kenya. Additionally, the period was considered to provide sufficient and complete data components meant for analysis, a buildup on one of the landmark journals by (Staking & Babbel, 1995), who carried out a related study (capital structure and interest rate sensitivity on insurance firms' sector) for seven years. However, during the test-retest to determine the reliability of using the entire population, the pretest analysis revealed outliers that would have negatively affected the research objectives should they have been considered for the final analysis stage. To cure these statistical gaps realized at the pretest analysis stage,

the outliers' firms were excluded, which left the research to concentrate on 32 firms for final analysis for a period of 10 years meant to test the study hypothesis.

3.4 Data Collection

The research used data of a secondary nature, which was obtained from NSE annual published financial reports related to listed non-financial firms through census. The data was populated using a secondary data capture form. Authenticatable relevant data from individual firms was observed and extracted from the published financial statements through a secondary data capture form. Kramer et al. (2009) confirmed that data validity tests how well an instrument is developed on a particular concept of the study, reliability which is determined by how effective the data addresses the pre-determined research objectives and its ability to withstand both internal and external tests when third party tests the same nature of data. In this case, to guarantee validity and reliability, the NSE had been identified as the best national regulator of all firms licensed to trade on its platform.

One of the requirements is always to ensure that member firms publish annual financial reports in a standard format, after which they are reviewed for compliance and finally publicized for stakeholders' consumption (NSE, 2021). Capital structure would require a ratio of total assets to debt proportion and equity proportion; finally firm market value would need EPS and total number of shares for each firm. Due to the existence of multiple variables over multiple periods, panel data was considered appropriate to allow for individuality, high-quality results, better control, as well as an increased degree of freedom.

3.5 Operationalization of Variables

Bhandari (2020) definition of operationalizing variables means expressing variables into measurable observations in a systematic manner based on the designed data meant to achieve the research objectives. In addition, (Sekaran, 2003) considers operationalization as the act of ascribing meanings to the research variables by applying the correct quantitative measure, which ensures that the outcome becomes reliable and accurate. Well-designed operationalized variables would guarantee the accuracy, validity, objectivity, and consistency of the tested hypothesis

This research study considered three variables namely; capital structure as an independent variable whose indicators were the ratio of debt proportion to equity proportion in capital structure; the market value of non-financial firms listed at the NSE whose indicators were considered to be the total number of outstanding shares and market price per share serving as dependent variable and lastly intervening variable hereby referred to as interest rate sensitivity whose indicators were average effective interest rate on short term and long term borrowing and effective interest rate on long term borrowing as tabulated below;

Table 1: Details of Operationalization of Variables

Variable	Indicators	Measurement source	Data Source	Measurement	Data Type
Capital Structure (independent variable)	Debt Proportion Equity Proportion (aggregate of short-term and long-term debt per year) and (no of shares X unit price per share per year)	(Otieno, 2015)	Published financial reports from NSE	TLTA and TETA	Ratio
Market Value (Dependent Variable)	Current Market price per share Total Number of Outstanding Shares	(Staking & Babbel, 1995)	Published financial reports from NSE	Current Market price per share X total number of outstanding shares	Ratio

Source: Author 2025

3.5.1 Testing Hypothesized Relationships

Table 2: Summary of research objectives, hypothesis, analytical methods, and interpretation

Objectives	Hypothesis	Analytical Methods	Interpretation
To establish the effect of capital structure on market value of non-financial firms listed at Nairobi Securities Exchange	$H_0$1; There is no significant relationship between capital structure and market value of non-financial firms listed at Nairobi Securities Exchange	Quantile Regression model $\mathbf{MV_t = \beta_0 + \beta_1 CS_t + \varepsilon_t}$ Where **MV=Market Value; B0=intercept β1=Slope CS=Capital structure t=Time (2012-2021) Ɛ=Error term** (degree of theoretical value-Actual value observed=0.05)	A change in the debt-equity ratio would significantly affect non-financial firms' market value. When R2 values associated with the quantiles 0.75, 0.50, and $0.25 \geq 0.5$ at a significance level of 0.05. Reject the null hypothesis and accept the alternate hypothesis

3.6 Data Analysis

Data collected from NSE-published reports for the ten years was intended to be analyzed using one of the best models discussed herein, the quantile regression model (Raios-Avila et. al., 2024) and (Tores-Reyna, 2007). Further, Panel data was preferred due to its ability to guarantee quality, better econometric estimation, and better control of possible unobserved variables. Hence, it is guaranteed to determine the nature of relationships existing between capital structure and market value of

non-financial firms, interest rate sensitivity, and market value of the firms, the joint effect of interest rate sensitivity and capital structure on firms' market value. Further, the panel data analysis perfectly combines both time series and cross-sectional data, guaranteeing the generalization of study findings.

3.6.1 Quantile Regression Model

The Quantile Regression Model provides an examination of the tested variables' relationships across different points, in this case, quantile ratios of Q=25, Q=50, and Q=75 along the distribution of findings, hence a more robust explanatory breakdown of the effects of the tested variables. This limits the generalization of the behaviors of tested variables (Raios-Avila et. al., 2024).

In summary, quantile regression was considered the best applicable model and robust as it captured heterogenous effects across quantiles by analyzing how independent variables affect different parts of dependent variable's distribution. Further, the model dealt with outliers and possible non-normal errors linked with panel data, especially heavy-tailed distributions, hence confirming its usefulness in financial and economic applications. Finally, quantile regression considers non-linear relationships associated with the predictor and predicted variables aligned to firms with distress status or extreme values.

Statistical Package for Social Science (SPSS) software was used in analyzing the panel data which was specifically destined to address descriptive and inferential statistics in determining variables' behavior against Arithmetic Mean, Standard Deviation, and data transformation to address the existence of possible outliers, and further testing of reliability and validity of panel data through diagnostic tests by applying tests such as normality, autocorrelation, stationary, endogeneity, heteroscedasticity and multicollinearity.

3.6.2 Analysis Model

3.6.2.1 Quantile Regression model

$$MV_t = \beta_0 + \beta_1 CS_t + \varepsilon_t \quad \ldots\ldots H_0 1$$

Where

MV=Market Value; B0=intercept β1=Slope, CSt=Capital Structure and Ɛ=Error Term t=Time (2012-2021)

$H_0 1$= There is no significant relationship between capital structure and market value of non-financial firms listed at Nairobi Securities Exchange

This model assumes that there are only two variables to be analyzed, as was proposed in $H_0 1$. The two variables here are capital structure and market value of non-financial firms listed at NSE. The structure of capital in this case was composed of debt and equity capital generated by the firms across the ten years.

4. Data Analysis and Interpretation

4.1 Descriptive Statistics

The first step in ensuring that panel data is clean and able to be relied upon in making statistical decisions is to preliminarily carry out test re-tests applying descriptive statistics analysis. This would ensure that the existence of either extreme values, missing data, or possible errors are addressed as early as possible instead of experiencing the gaps at the tail end of the research findings generalization. The analysis of the collected panel data revolved around the detection of the possible existence of the outliers, data transformation, and analysis of central tendency and distribution of variables data.

Table 3: Descriptive Statistics Summary

Stats |	Firms Market Value (000)	Capital Structure
N |	320	320
mean |	279974.35	.52615
p50 |	151766.00	.57050
sd |	430013.912	1.651572
iqr |	361671	.560
range |	2002879	38.241
p25 |	16864.50	.31525
p75 |	378535.00	.87500
min |	392	-23.251
max |	2003271	14.990
skewness |	2.854	-7.304
kurtosis |	7.989	153.254

Table 3 above provides descriptive statistics for two variables underpinning this research from the years 2012 to 2021. Firms' market value reported a mean average of Ksh. 279974.35 and the median, p50 of Ksh 151,766.00, indicating a positively skewed distribution with a higher concentration of values towards the lower end. The substantial range of Ksh. 2,002,879, from the minimum of Ksh 392 to the maximum of Ksh. 2,003,271, suggests significant variability in market values among the sampled firms, indicating that various firms inherit varied firm values based on the strength of their capital structure and the firms' industry. The skewness of 2.854 and kurtosis of 7.989 highlight the asymmetry and heavy-tailed nature of the distribution, indicating potential outliers or extreme values. This implies that while the average market value is relatively high, there are firms with exceptionally

high market values that influence the overall distribution.
Capital Structure reported a mean of .52615 and median of .57050, revealing a positively skewed distribution, emphasizing a concentration of firms with lower capital structures falling in which industry. The interquartile range (IQR) of .560 suggests substantial variability between the 25th and 75th percentiles, additionally, firms with capital structures higher than .87500 are in the upper quartile, suggesting a relatively high reliance on debt in their capital structure, thus levered. The main reason stems from the affordability of debt over equity due to the interest deductibility advantage. The skewness of 2.854 and kurtosis of 7.989 indicate a distribution with a longer and fatter tail, suggesting the presence of extreme values. This implies that a significant portion of the sampled firms tends to have lower value in their capital structures, implying that different firms possess different firm's values in capital structure depending on the nature of the industry and firm size. It is equally evidenced that there are outliers with notably higher capital structures associated with bigger firms in capital structure composition, contributing to the positive skewness and heavy tails.

4.1.1 Analysis of Correlation

This analysis helps in determining the degree of reliability of the research variables and how they relate with one another, whose relationships are key in ensuring that the research hypothesis withstand quantitative tests geared towards addressing the research objectives.

Table 4: Analysis of Correlation

	lnFirmsval	lnCapStruc
lnFirmsval |	**1.0000**	
lnCapStruc |	**0.2552**	**1.0000**
lnInterestS |	**0.0057**	**-0.0336**

The table presents the correlation coefficients between two variables statistically presented as: "lnFirmsval" (natural logarithm of the firm's market value) and "lnCapStruc" (natural logarithm of the capital structure). The correlation coefficient ranges from -1 to 1, where 1 indicates a perfect positive correlation, -1 indicates a perfect negative correlation, and 0 indicates no correlation. Starting with lnFirmsval, the correlation coefficient of 1.0000 itself signifies a perfect positive correlation, as expected. This implies that the natural logarithm of the firm's market value is strongly correlated with itself, suggesting a direct relationship between the firm's market value and its past values. Similarly, on lnCapStruc, the correlation coefficient of 0.2552 with lnFirmsval suggests a positive but relatively weak correlation between the natural logarithm of the firm's market value and the natural logarithm of the capital structure, implying there is some degree of association between the firm's market value and its capital structure, but the relationship is not as strong.

4.2 Diagnostics Test

Diagnostic tests were applied to determine normality, collinearity, homoscedasticity, endogeneity, and Stationarity tests for the variables; capital structure, interest rate sensitivity, and market value of firms representing the variables as independent, intervening, and dependent, respectively. These tests were carried out after a data cleaning exercise occasioned by a lack of complete data for some firms due to late joining of NSE or exited operations from NSE during the period considered by this study, which saw the outliers excluded. The test output eventually considered 32 firms throughout chapter four in making the final analysis decision.

4.2.1 Normality Test

To confirm normal data distribution around this study population, the Shapiro-Wilk test was employed as a numerical confirmation. This was a result of test-retest to remove extreme data values and the final log transformation of the final data point of 320. The numerical justification was to be kept at 0.05 and any deviation meant a departure from normality. The table that follows describes factors that were considered in concluding the normality test as detailed below;

Table 5: Shapiro-Wilk W test for normal data

	Kolmogorov-Smirnov[a]		Shapiro-Wilk			
	Statistic	df	Sig.	Statistic	df	Sig.
Firms Market Value (Ksh)	.258	320	.000	.601	320	.000
Capital Structure (Ksh)	.356	320	.000	.251	320	.000

Shapiro-Wilk W test results for normality provide insights into the distribution of the transformed variables under consideration: The W statistic, which considers normally distributed data to be w=0.05 at 95% level of significance with a departure leading to rejection or acceptance of the hypothesis. In the case of lnFirmsval, the W value is >0.05, at 0.601 indicating a departure from normality. Similarly, lnCapStruc exhibit W values of 0.251, further suggesting non-normal distributions for these variables. Similarly, Kolmogorov that tests the null hypothesis that a set of data comes from a normal distribution indicated values of, > 0.01 for all the variables all of which show a departure from normality. Both the tests (Shapiro and Kolmogorov) indicate a rejection of the null hypothesis that the data follows a normal distribution. Consequently, it can be inferred that all t variables deviate insignificantly from a normal distribution except the firm's market value, which posted 0.601 based on the Shapiro-Wilk test.

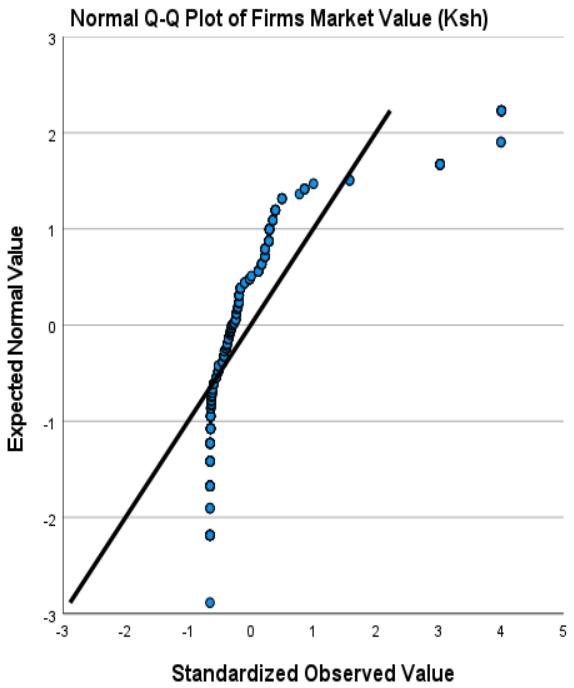

Figure 2: Firms' value Normality -Normal Q-Q Plot

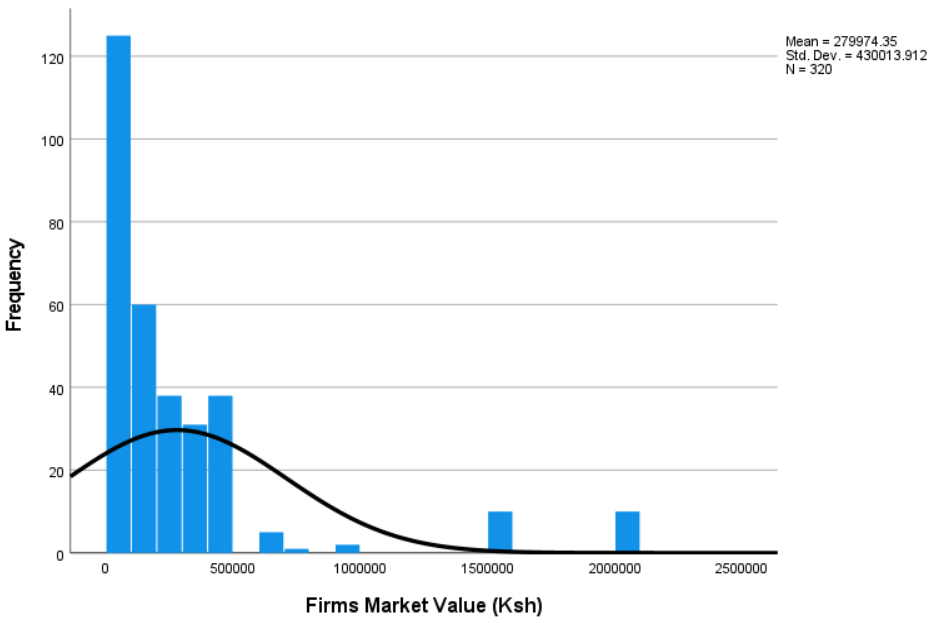

Figure 1: ***Firms' value Normality -Histogram***

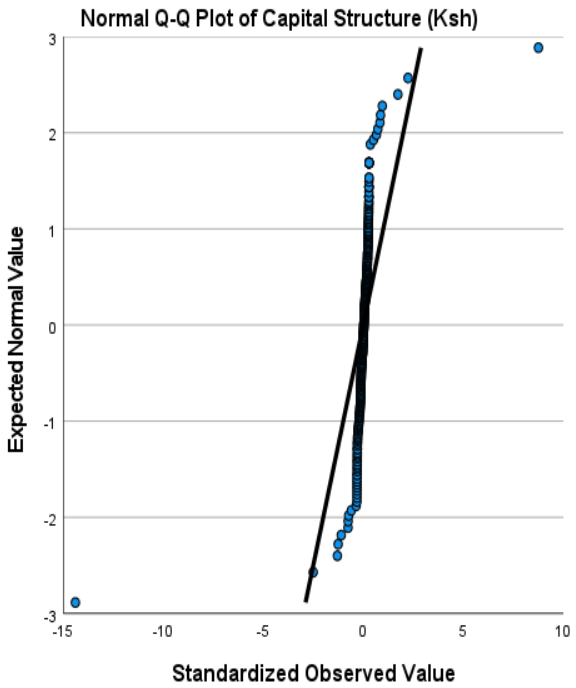

Figure 2: Capital Structure Normality-Q-Q Plot

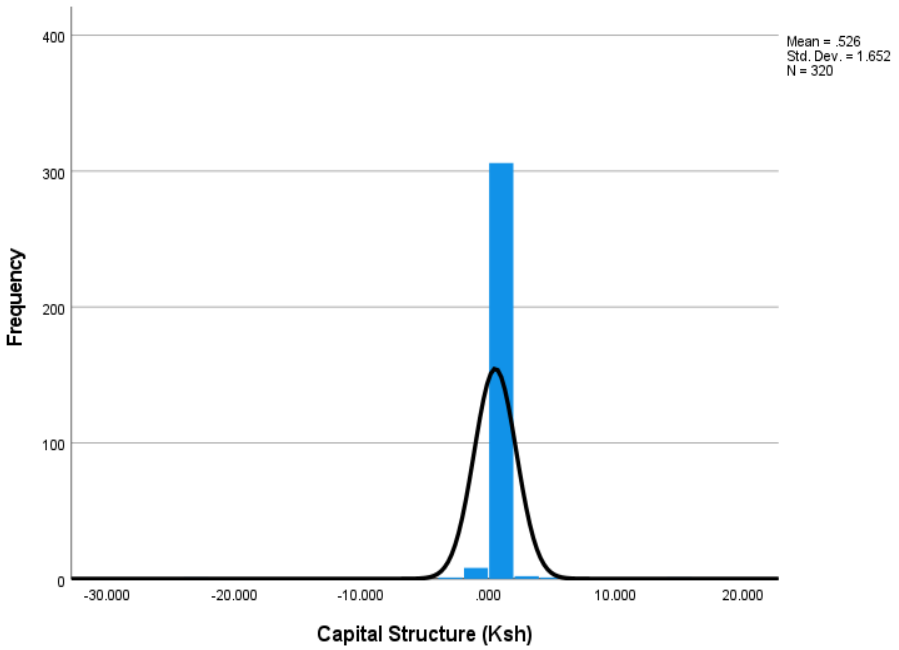

Figure 3: Capital Structure Normality-Histogram

4.2.1.1 Outliers

Extreme data values do cause data output to be unreliable as a result of false generalization of final research findings, hence the possibility of misleading the consumers, especially when they would rely on the report findings to make informed financial management decisions. Given the existence of outliers detected at the data pretest stage occasioned by missing complete data for ten years, an intervention was initiated to address these data gaps. The detections were substantiated statistically by using box plots to detect extreme data points, which were subsequently isolated from data analysis. The total number of firms isolated was 13 due to a lack of complete data at some point, which led to the final analysis relying on 32 firms, culminating in 320 observations. More specifically, the six firms from the agricultural sector were dropped from the dataset as a result of zero debt, "unlevered" in their capital structure, given that they relied on equity to finance business operations except for the years 2019, 2020, and 2021 where they insignificantly borrowed at an average interest rate of 11% which led to debt to equity ratio attracting less than 3% whereas three were drawn from commercial and services, one from investment services, two from manufacturing sector and finally one from real estate other which had completely missing data in some years due to going under, or joined NSE later after 2016.

4.2.1.2 Data Transformation

In addressing the non-normality in the dataset, a log transformation was employed to meet the assumptions for parametric tests and to ensure that patterns in data output become more interpretable with the afterward results shown below;

Table 6: Data Transformation

Variable	Data transformation
Firms market value	Log Firms market value
Capital structure	Log Capital structure

The section presents descriptive statistics about this research variable in relation to mean, mode, standard deviation, range, minimum, maximum, skewness, and kurtosis upon 320 observations, (N). Mean measures of central tendency are used to explain the most typical value among the observed frequency. The arithmetic mean is very useful because it represents the values of most observations in the population. The mean, therefore, describes the population quite well in terms of the magnitudes attained by most of the members of the population. The standard deviation reflects an accurate impression of how much the population data varied from the mean, whereas range is defined as the difference between the highest and the smallest values in a frequency distribution. In this case, SD was higher than the mean in firms' value and capital structure variable, which prompted outliers. This was corrected by excluding the outliers before further analysis was carried out. Further, skewness measures the symmetry or asymmetry of the population

distribution of a real random value about its mean, meaning when data is dispersed in a balanced way from the left and from the right along the x-axis, it is termed as symmetry while the opposite becomes asymmetric data while kurtosis measures the peakedness or flatness of data distribution from the normal distribution, (Kothari, 2010).

4.2.2 Multicollinearity

In regression analysis, multi-collinearity may cause analysis problems if it appears that two or more independent variables in a model become more correlated. The effect may lead to difficulty in knowing how either of the variables affects the dependent variable, hence misleading an unrealistic conclusion. The following table provides a numerical interpretation of the findings.

Table 7: Multicollinearity Test using VIF

Variable |	VIF	1/VIF
Ln (Capital Structure) |	1.00	1.001
Mean VIF |	1.00	

The multicollinearity test results indicate that the variance inflation factor (VIF) for each independent variable, including the natural logarithm of the firm's market value (lnFirmsval), ln(Capital Structure). The mean VIF is also reported as 1.00. These VIF values are exceptionally low and fall well below the commonly accepted threshold of 10, suggesting a lack of multicollinearity among the independent variables in the regression model. In this context, VIF values close to 1 indicate that there is minimal correlation among the independent variables, and the variable can be considered independently without redundancy. This absence of multicollinearity is crucial for the reliability of regression results, as high multicollinearity can lead to unstable coefficient estimates and decreased precision in predicting the dependent variable. Therefore, the findings from this multicollinearity test provide confidence in the robustness of the model, suggesting that the selected independent variables—the Firm's market value, Capital Structure, and Interest Rate Sensitivity—contribute unique information to the regression model, allowing for more accurate and reliable insights into the factors influencing the natural logarithm of the firm's market value.

Table 8: Endogeneity Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.003[a]	.000	-.006	431366.803	.170

In a different test, endogeneity becomes a threat to inferring causal effects in a regression analysis model when the predictor variable, in this case, capital structure

is significantly correlated with the error term. Further, Durbin-Watson indicates 0.17 and a standard error of 431366.803, which is below the accepted value of 2, indicating a statistically positive autocorrelation between dependent variables against independent variables.

Table 9: Heteroscedasticity *Test*
Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity

Model		Sum of Squares	Df	Mean Squares	F	Sig.
1	Regression	616.696	3	205.565	0.181	0.910[b]
	Residual	359680.35	316	1138.229		
	Total	3606297.029	319			

The results of the Breusch-Pagan / Cook-Weisberg test for heteroscedasticity, specifically examining the fitted values of LnFirms Market Value, reveal a significant value of 0.910>0.05 null hypothesis (Ho) posits constant variance, and the relatively high p-value hence fails to reject this hypothesis at conventional significance levels, suggesting the absence of heteroscedasticity in the model for the Firms Market Value variable. The implications of these results are twofold. First, the finding supports the assumption of constant variance in the model, reinforcing the reliability of standard errors and parameter estimates derived from the regression analysis for firm market value. Second, it indicates that there is no significant departure from homoscedasticity, suggesting that the variability of the residuals remains relatively constant across different levels of the independent variable.

4.3 Homoscedasticity Test

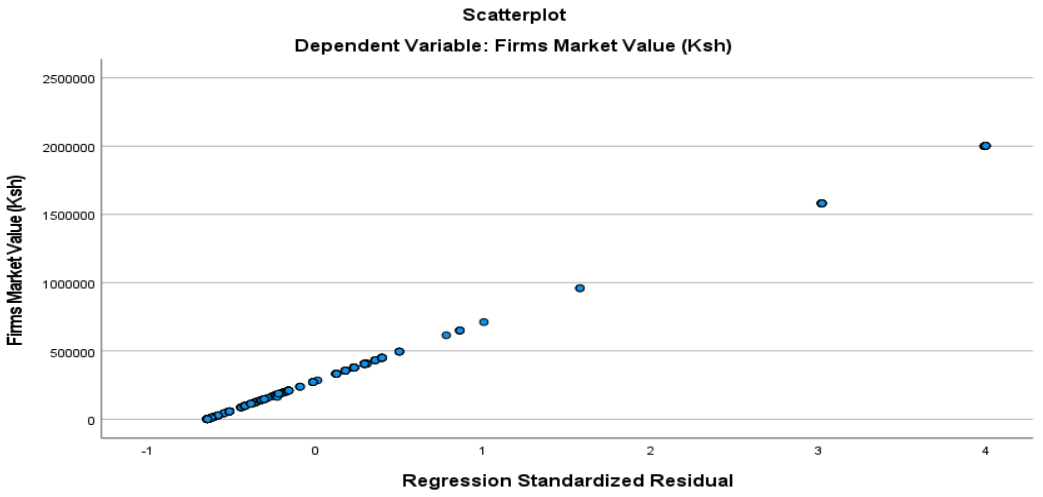

Figure 6: Lack of homoscedasticity

The figure confirms the lack of homoscedasticity as the relationship between firms' market value along the Y axis indicates a smooth correlation with no outliers along the X axis on regression residuals. It is worth noting that homoscedasticity assumes that variances of residuals do appear the same across the dependent variable, which is not the case as depicted by the scatter plot, which shows consistency of regression standardized residuals herein referred to as capital structure and interest rate sensitivity.

4.3.1 Stationarity Test

The tables below present the results of the Levin-Lin-Chu unit-root test conducted to assess the stationarity of the Capital Structure and firm market value across the dataset. The null hypothesis (Ho) was that the panels contain unit roots, indicating non-stationarity, while the alternative hypothesis (Ha) suggests that the panels are stationary. The analysis involves 32 panels with a total of 10 periods between 2012 and 2021, and the test considers common AR parameters and includes panel means as well as a time trend.

Table 10: Levin -Lin unit-root Test for Capital Structure

Ho: Panels contain unit roots	Number of panels =32	
Ha: Panels are stationary	Number of periods =10	
AR parameter: Common	Asymptotics: N/T -> 0	
Panel means: Included		
Time trend: Included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		
	Statistic	**p-value**
Unadjusted t	-17.1987	
Adjusted t*	-10.8049	0.0000

According to the table above, the results indicate that the test rejects the null hypothesis of unit roots in the panels. The unadjusted t-statistic is -17.1987, and the adjusted t-statistic, accounting for panel means and a time trend, is -10.8049 with a p-value of 0.0000. These statistics strongly support the rejection of the null hypothesis, suggesting that the Capital Structure variable was stationary. The use of ADF regressions with one lag and LR variance estimation employing a Bartlett kernel with an average of 6.00 lags (chosen by LLC) further supports the conclusion; this implies that the structure of capital remained relatively constant over time, providing a stable foundation for financial planning and forecasting.

Table 11: Levin -Lin unit-root Test for Firms Market Value

Ho: Panels contain unit roots	Number of panels = 32	
Ha: Panels are stationary	Number of periods =10	
AR parameter: Common	Asymptotics: N/T -> 0	
Panel means: Included		
Time trend: Included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)		
	Statistic	**p-value**
Unadjusted t	-7.5426	
Adjusted t*	10.3656	0.0000

The statistical results show an unadjusted t-statistic of -7.5426. The adjusted t-statistic, crucial for assessing stationarity, is 10.3656, with a corresponding p-value of 0.0000. The high adjusted t-statistic suggests that the null hypothesis of unit roots in the panels can be rejected, providing evidence in favor of the alternative hypothesis that the panels are stationary.

5. Hypothesis Testing and Discussion of Findings

5.1.1 Capital Structure and Market Value of Non-Financial Firms Listed at Nairobi Securities Exchange in Kenya

The study sought to establish the effect of capital structure on the market value of the non-financial firms listed at NSE, Kenya as the first objective. These hypothesis findings have been singularly discussed as follows;

5.1.1.2 $H_0$1; There is no Significant Relationship between Capital Structure and Market Value of Non-financial Firms listed at NSE

This section was meant to test the first hypothesis of this study enshrined on the two major variables namely; the independent variable, "capital structure, and the dependent variable, "firms market value, under the null hypothesis.

The following Table 12 describes the findings associated with $H_0$1; "there is no significant relationship between capital structure and market value of non-financial firms listed at NSE; to confirm the null or alternate hypothesis, quantile regression analysis model was run with a study population of 32 firms culminating to 320 observations drawn from final data over ten years' period which represented the total number analyzed of firms.

Table 12: Testing of hypostudy - H01 Capital Structure and Market Value

Number of obs = 320			
Number of groups = 32			
Model Quality a, b, c			
	q=0.25	q=0.5	q=0.75
Pseudo R Squared	0.819	0.788	0.862
Mean Absolute Error (MAE)	49879.9750	49260.6156	58822.1219
a Dependent Variable: Firms Market Value b Independent Variable: Capital Structure c Method: Simplex algorithm			

The Table 12; analysis of capital structure and market value revealed a strong and statistically significant results all across the quantiles. The model quality that yielded the results had been subjected through Pseudo R squared values, the corresponding Mean Absolute Error of firms' value with application of simplex algorithm method. The results indicated that the pseudo-R squared among the quartiles; q=0.25, q=0.5, and q=0.75, yielded 0.819, 0.788, and 0.862, respectively, suggesting that the model explains 78% to 86% of the variations in market value across the quantiles hence confirmation of strong relationship between independent variable and the dependent variable. As a result, it was deduced that the structure of capital played a significant role in explaining market value performance. Furthermore, low MAE, ranging from 49,260 to 58,822, suggests the best fit and explains how close the model is to actual market values. Therefore, the result of the analysis provides a better plotting fit. Further details in the result included 32 groups and 320 observations over the 10-year period that were considered in the analysis model. Finally, the null hypothesis was therefore rejected.

5.1.2 Ho1: The relationship between capital structure and Market value

Results of the Ho1 revealed the significant effect the structure of capital had in determining firms value under various levels of quantiles where the regression revealed that q=.75 explained higher effect of 0.862 followed by q=0.25 with 0.819 and finally the median q=.50 with 0.788 with a mean absolute error of firms value ranging from 58822.1219, 49879.9750 and 49280.6156 respectively. The findings were based on 32 firms with 320 observations over a ten-year period. It was further noted that the null hypothesis stood rejected as the percentage influential of the independent remained high by explaining over 86.2% of firms value

Theoretically, the higher explanatory power of the predictor variable against the value of the firm confirmed alignment to the first theory associated with; (Modigliani & Miller, 1963) proposition II. This theory stated that firms' value remains steadily increasing as long as management preference remains on cheaper debt occasioned by deductibility of tax expense before realization of net operating

income. Such expenditure savings are the major drivers of growth whenever management prioritizes their capitalization. Further, in a different dimension, the additional anchoring theory of (Myers, 1984) "pecking order theory" was evidenced especially where firm managers gave priority to both the short- and long-term debt over equity as interest rate kept on declining to its lowest at 11.45% in the year 2021 signaling cheaper loans. Finally, the market timing theory (Ross, 1977) and liquidity preference theory (Keynes, 1976) wraps up theoretical alignment with these findings because as market information about the declining trend of prevailing interest rate took shape, demand for cheap loanable funds followed precedent.

Empirically, (Jaros & Bartosova, 2015), in their review of Modigliani and Miller's paper on capital structure choice, equally was confirmed to aligned to this research finding because their study found out that a major effect was realized between capital structure and firms' value with management giving preference to debt over equity. Their argument was as a result of the preference of deductibility of taxes associated with debt, an advantage that would not be realized in equity capital. Further (Admati et. al., 2018) reviewed academic work that portrayed similar significant results. However, they further confirmed that shareholders are keen to ensure leverage appetite is allowed to an acceptable level otherwise, uncontrolled appetite may have reversed firms' value.

In a foreign context, the case of Tehran is equally in agreement with these research findings with a study that looked into the effect of capital structure and firm value, which yielded a significant relationship (Fumani & Moghadam, 2015). The final similarity in findings under the foreign context, in Turkey, confirmed a significant negative relationship with a confirmation that reduction in debt proportion in the structure of capital reduces firm value. The microfinance sector posted the same significant relationship, a special sector separated from the main Johannesburg Securities Exchange with priority given to short-term debt over long-term debt and equity for 3 years (Chikeya, 2019), a confirmation that even a short period of study the implication was equally the same for a longer period of years. Kenyan context, based on the unpublished study, showed the same significant relationship between debt and equity against financial performance for all the firms listed at NSE, which included all economic sectors (Tonui, 2018) and (Mutegi, 2018).

In conclusion, the results suggest that capital structure significantly influences firms market value particularly for firms whose values fall on the upper quartile 0f 0.75. However, despite median and lower quantiles showing lower results, their finding equally shows significant effect giving general conclusion that all firms values are significantly affected by management decision financing through either equity or debt.

Table 13: Summary of hypothesis testing, results, and interpretation

Objectives	Hypothesis	Analytical Methods	Result	Interpretation
To establish the effect of capital structure on market value of non-financial firms listed at Nairobi Securities Exchange	**$H_0$1**: there is no significant relationship between capital structure and market value of non-financial firms listed at Nairobi Securities Exchange	Quantile Regression model **MVt= β0+β1CSt+Ɛt** Where **MV=Market Value; B0=intercept β1=Slope CS=Capital Structure (Debt +Equity) t=Time (2012-2021) Ɛ=Error** term (degree of theoretical value-Actual value observed=0.05)	The null hypothesis was rejected	The R2 values associated with .75=0.862, .50=0.788 and .25=0.819 all lying within 0 to1 and ≥0.5 at significance level of 0.05. Therefore, based on the Pseudo R square test, there is sufficient evidence to accept the alternate hypothesis, suggesting that, at the 5% significance level, there is a significant relationship between capital structure and the market value of non-financial firms

6. Summary, Conclusion and Recommendation

6.1 Summary of Findings

This research was based on the the variables, namely capital structure and market value as the dependent variable. Contextually, Kenya was prioritized based on the academic gaps stated earlier, proximity to the researcher, and limited research financial resources. Further, non-financial sector preference was guided by its major contribution factor to GDP and as well as job opportunity platform for the majority of Kenyan youths. In addition, due to well-organized and regulated institution, NSE was found fit to be the best source of research data since its guaranteed data validity, reliability and accuracy. It's worth noting that the study was driven by three main research objectives namely; to establish the effect of capital structure on the market value which led to determination of Ho1. The tested hypothesis subjected to diagnostic tests were realized by considering thirty-two firms, culminating into 320 observations for ten years, 2012-2021, applying the quantile regression model.

In the first place, objective one resulted in the significant relationship between dependent and independent variables to a greater extent based on the analysis model, "quantile regression," which perfectly addressed all the envisioned tests as it was designed to address the Ho1, segmenting the results into=.25, Q=.50 and Q=.75, thereby spreading the results for better comprehension. The model found out that the Pseudo R2 values associated with quartiles .75=0.862, .50=0.788 and .25=0.819 all lying within 0 to1 at a significance level of 0.05 perfectly confirmed the structure of capital power to determine the market value performance across the thirty-two firms. Therefore, based on the Pseudo R square test result, there is sufficient evidence to accept the alternate hypothesis, suggesting that, at the 5% significance

level, there is a significant relationship between capital structure and the market value of non-financial firms.

In conclusion, theoretically, (Modigliani and Miller, 1963) preposition II, (Myers, 1984) "pecking order theory, market timing theory (Ross, 1977) were all found to support this research findings together with the reviewed journals for example, reviewed journals, however, portrayed varied results as was compared with the findings confirming academically that various researchers may have divergent views despite having similar variables of the study more so based on sectoral factors, regulatory factors, contextual factors as well as conceptual considerations.

6.2 Conclusions

This chapter derived its conclusions by looking into the key research objectives where the first objective was intended to establish the effect of capital structure on the market value of non-financial firms listed at the Nairobi Securities Exchange in Kenya, where the result found that there was significant relationship between capital structure and the market value of non-financial firms listed at the Nairobi Securities Exchange, meaning that despite increasing the leverage as a result of fluctuating interest rate as low as 11% and as high as 18% over the 10 years study period, firms value remained significantly affected. This was verified upon collecting data for a period of 10 years from 2012-2021, looking into all listed firms at NSE except for the banking and insurance sectors. Significantly, all firms showed increasing growth in debt and equity except a few, which were excluded due to missing critical data, with the final data settling on 32 firms instead of 45, as described in Chapter 4. Theoretically, (Modigliani and Miller, 1963) preposition II did hold despite having higher leverage where the null hypothesis was rejected, hence a significant effect on firms' value. (Myers, 1984) the pecking order theory also stood the test as it was considered among the theories underpinning this research, with the trend showing firms prioritizing cheaper debt over additional expensive equity both in short-term and long-term status.

Empirical evidence reviewed supported this study's findings, ranging from (Admati et al., 2018), with their findings showing similar results but going further and confirmed that shareholders are keen to ensure leverage appetite is allowed to an acceptable level. A Tehran study was equally in agreement with these research findings (Fumani & Moghadam, 2015). The final similarity in findings under the foreign context, in Turkey, confirmed a significant negative relationship with a confirmation that reduction in debt proportion in the structure of capital reduces a firm's value. In locally regulated sectors other than internationally regulated security exchange markets, the Microfinance sector posted the same significant relationship (Chikeya, 2019), not forgetting the Kenyan context majorly on unpublished research articles ended up posting similar findings in line with $H_0 1$ as evidenced by scholarly works of (Tonui, 2018) and (Mugeti, 2018).

Further, the research looked into the third objective to establish the joint effect of capital structure and interest rate sensitivity on the market value of non-financial

firms listed in Nairobi Securities Exchange. Having looked at these variables independently in the earlier analysis, the joint effect equally portrayed significant correlations. Jointly, capital structure and interest rate sensitivity do appear to be statistically significant in influencing the performance of the market value of the firms. Therefore, the joint effect of capital structure and interest rate sensitivity does appear to be statistically significant in influencing the market value of the firms in the study having the R2 values associated with .75=0.862, .50=0.789, and .25=0.819 all lying within 0 to1 and closer to 1 at a significance level of 0.05 indicating that there is sufficient evidence, implying that firms' capital structure and interest rate sensitivity jointly are significant predictors of firms' market value concurring with (Modigliani & Miller, 1963) preposition II that argues that firms that take advantage of tax deductibility in debt capital composition.

6.3 Recommendations

This section discusses the key sectoral, academics, management, and policy recommendations aligned to this research findings as described in the document and as envisioned in chapter one. These practical recommendations are vital to whoever will find this study valuable.

6.3.1 Contribution to the Body of Knowledge

Theoretically, findings are anticipated to be of great importance in complementing the body of knowledge through critiques, learning, and gaining more academic knowledge in finance discipline, which would be in line with the stated variables, namely, capital structure and market value.

Market timing theory (Ross, 1977) stood the test as a result of this study's findings, as it was evidenced that firms traded on bonds at different periods as a result of favorable interest rates. Collected data indicated clearly that several firms offloaded bonds that were perceived to be expensive and traded them off with cheaper bonds as the interest rate persistently showed a declining trend from 18.15% down to 11.45% on long term debt and from 18.15% to12.16% on short term debt for the 10 years, while other firm managers invested in new bonds as a result of speculative factors based on the interest rates movement trends coupled with the possibility of excess funds available for additional investment. It was deemed that market timing would, at a future date, see the rate of interest increase immediately after it reached the tipping point, which would trigger better bond income, hence higher speculative firms' market value. Such moves will see reversed changes in the debt-to-equity ratio, bond maturity, interest rate sensitivity, inverse relationship between interest rate and debt capital, as well as market capitalization. This research can, therefore, conclude that the market timing theory has stood the test of time as a theory and can be relied upon in making academic decisions.

Additionally, the pecking order theory (Myers, 1984) vividly stood the test of academic conformity. Based on this research model, firms indicated a similar pattern of giving priority to cheaper debt over expensive equity up to a certain point

to avoid dilution of shareholders' stakes, as too much debt may lead to financial distress, especially when firms are not able to settle the loan obligations when they fall due. It was equally observed that the priority of both short-term debt and long-term debt relied on the interest rate risk factor. An additional theory that stood the test was (Modigliani & Miller, 1963), which saw managers of firms taking consideration of trading in shares and bonds in equal proportion to ensure firm value remains stable or increases by balancing the ratio between debt and equity by considering the driving factor, "interest rate sensitivity." Such moves are geared towards minimizing agency conflicts, sustaining shareholders, attracting potential investors, managing restrictive covenants, expanding business through possible mergers and acquisitions, and guaranteeing return on investments.

A quantile regression model would be appreciated as modern, robust, and able to deal with minor variations, which guarantees the reliability of analysis output. I would recommend this model, "Quantile Regression," for further application by students who would wish to carry out similar or related studies. Further, the model can give results broken down into quartiles, which gives a further range of variables relationships leading to robust informed decision-making by firm managers. Further, as for the Kenyan context characterized by a change of political regime, a ten-year period or above would be worth considering as this would help scholars willing to carry out similar tests in the future to observe regime change management of interest rate risk and how such economic decisions impact on investment opportunity in terms of capital structure mix and firms' stability.

By extension, academicians who are interested in carrying out further research considering the same or related variables would continue with the gaps realized in this research or consider the content among their reviewed journals under contextual and or conceptual considerations. Commercial authors under the finance discipline, via the consent decree, would equally find this content very useful and complement the findings in their publications equally. Academically, I would wish to encourage academicians and commercial researchers to look further into additional variables other than these three, other conceptual considerations within Kenya, increasing research period, and change of economic sector for a more robust finding that would allow the government to specifically address the real problem that would guarantee positive firms market values.

6.3.2 Contribution to Management

I would wish to recommend these research findings to non-financial firms' decision makers who would find it necessary and consider the variables in decision-making. In a different dimension, the relationship findings would explain how better non-financial firms' management would be able to position themselves in matters related to enhancing firms' market values in regulated security exchange markets in Kenya with the tested hypothesis findings. In the first step, a significant relationship between capital structure and firm market value provides significant leverage to firm managers who are entrusted with shareholders' finances to invest wisely. A

ten-year period proved that as average interest rates declined steadily from 18.15% to 11.15%, there was evidence of switching to both short-term and long-term bonds by firms led by blue chip firms in the telecommunication sector, a move that could be adopted by other firms' managers by taking advantage of monitoring market information and making an informed investment decision. A proactive manager can take the opportunity to trade off an expensive debt against cheaper debts as interest rates continue to fall, which would see a valued, cost-effective capital structure translating into releasing more finances for profitable investment opportunities. Such profitable moves allow significant trust between shareholders and bondholders, shareholders and management, create trust and creditworthiness standards, attract incentives towards firm managers, and reduce agency costs, besides attracting other potential investors.

In the event that managers burst investment margin as a result of stable capital structure choice and stable firms' value, an expansion of business can be sought through the acquisition of other poorly managed firms that would be turned around, further increasing merger value in the long run. Besides acquisition, prospective managers, upon realizing potential economic synergy, may take advantage of a merger, a situation that may be reached as a result of a party having a strong capital structure and another one with a stable market value. The merger would likely create a strong brand and profitable products, thereby increasing the new formation value.

6.3.3 Contribution to Policy Formulation

Apart from management, policymakers like government agencies, KRA, CBK, NSE, Chamber of Commerce, etc. Would factor in incentives other than interest rate and capital structure regulations to incentivize firms that would see them grow in market value since nonperforming firms may opt out of the country and relocate to other countries with better financial and economic terms or shut down completely as had been seen from the collected data. Such moves would affect GDP through loss of job opportunities, low tax revenue, loss of transfer of expatriate labor capital, discourage potential investors as well as poor global country ranking based on inefficiency to operate a business in Kenya. CBK may consider prevailing interest rates in a manner that would have a significant effect on borrowings. NSE should consider creating a favorable business environment platform that guarantees entrants to the market and not moving earnestly to deregister existing firms or regularly change compliance conditions as economic performance changes as a result of legislative changes since Kenya is characterized by legislative, economic changes after every five years which have ended up affecting capital structure of some sectors, e.g., agricultural and manufacturing and allied. The Chamber of Commerce should look into security market indicators other than capital structure, which should be introduced to promote positive firm value. Such moves would form an economic appetite and woe global and regional investors with a guaranteed return on the firm's value.

Further, key stakeholders not limited to the government and international financial regulators would find this report important in policy formulation through the publication of financial journals whose content would be read by interested individuals or stakeholders for informed decision-making.

6.4 Limitations of the Study

This research study blueprint ended up with some limitations, though not adverse, that affected the realization of the stated objectives. At the proposal stage, the anticipated population was considered to be forty-five non-financial firms listed at NSE in Kenya. However, during field data collection, there was an emergence of firms with incomplete data within the data set, which was realized and transformed accordingly since their inclusion would have led to misleading generalization of the research findings. To guarantee data validity and reliability, 13 firms out of 45 had to be excluded from the dataset before further analysis was carried out. Seven firms that were dropped from the dataset had zero debt in their capital structure, given that they relied on equity to finance their business operations, whereas five other firms had completely missing data in some years. Further, financial constraints during the research period became much of a challenge, especially during data gathering. In addition, some data components would show incomplete information, which called for the researcher to explore other skills to gather the missing information elsewhere. These scenarios led to delays in completing fieldwork on time.

6.5 Suggestions for Further Research

As for this research, which explored the existence of relationships between capital and market value of non-financial firms listed at the Nairobi Security Exchange in Kenya, further research would be recommended to test the same variables by considering firms not listed or the entire firms listed at NSE or completely looking into other variables other than these but retaining firms value or alternatively retaining the same variables with another measure of financial performance other than firms value. Contextual consideration may also be explored by considering carrying out the same research outside Kenya, more specifically, in the least developed countries, which are majorly occasioned by economic incentives or a combination of East African Community member states since they possess varied interest rates on borrowings.

The research period may be extended beyond 10 years, tracing backward and targeting three political regimes as there may be financial legislative uptakes related to firm's market value. Finally, one may explore financial firms and the insurance sector by maintaining the same variables and testing the hypothesis as have been tested herein.

ACKNOWLEDGEMENTS
Humble acknowledgement to my co-authors, Dr. Nixon Omoro and Dr Luther Otieno, NACOSTI which authorized access of secondary published data and to my family members at large

References

[1] Admati, A. R., Demarzo, P.M., Hellwig, M. F. & Pfleiderer, P. (2018). The Leverage Ratchet Effect. Journal of Finance, 63 (1), 145-198.
[2] Ahmadpour, A., & Yahyazadehfar, M. (2010). Financial Management Leverage. Mazandaran University, 7th edition.
[3] Akerlof, G. A. (1970). The Market for "Lemons": Quality Uncertainty and the Market Mechanism. Quarterly Journal of Economics, 84 (3), 488-500.
[4] Baker, M. & Wurgler, R. (2002). Market Timing and Capital Structure. Journal of Finance, (57), 1-32.
[5] Baxter, N. (1976). Leverage, risk of ruin, and the cost of capital. Journal of Finance, 22, 395-403.
[6] Bhandari P. (2020). What is quantitative research? Methods and examples. https://www.scribbr.com/methodology/quantitative-research.
[7] Bhattacharya S. (1988). Corporate finance and the legacy of Miller and Modigliani. Journal of economic perspective, 2(4), 135-147.
[8] Boyani, O. R. (2013). The effect of capital structure on the Cost of Capital of firms listed at Nairobi securities exchange, unpublished.
[9] Brealey, R. & Myers, C. (1988). Principles of Corporate Finance (3rd Ed) New York, McGraw-Hill.
[10] Chen, J. & Strange, R. (2005). The Determinants of Capital Structure: Evidence from Chinese Listed Companies. Economic Change and Restructuring, 38, 11-35.
[11] Chikeya, R. (2019). Effects of Capital Structure on Company Performance, A Perspective of Small Cap Companies In South Africa., Faculty of Commerce, Graduate School of Business (GSB).
[12] Cooper, D.R. & Schindler, P.S. (2003). Business Research Methods. New Delhi Tata McGraw-Hill.
[13] Copeland, T.E. & Weston, F.J. (1988). Financial Theory and Corporate Policy. (3rd Ed), Addison-Wesley Publishing Company.
[14] Ehrhardt, M. & Brigham E. (2003). Corporate Finance, a Focused Approach. (1st Ed), Mason, Thomson.
[15] Fama, E. F. & French, K.R. (1998). Taxes, financing decisions, and firm value. Journal of Finance, (53), 819-843.
[16] Fumani, M. A. and Moghadam, A (2015). The effect of capital structure on firm value, the rate of return on equity, and earnings per share. Research journal of finance and accounting, 6, (15), 50-57.

[17] Gordon, R.H., and Shoven, J.B. (1982). Interest rates, Inflation and Corporate Financial Policy, Brookings Paper on Economic Activity, 2, 461-491.
[18] Harvey, C. (1995). Predictable risks and returns in emerging markets. The review of financial studies, 8, (3), 773-816.
[19] Jaros, J. & Bartosova, V. (2015). To the capital structure choice: Miller and Modigliani model. Procedia Economics and Finance, 26 (1), 351-358.
[20] Jensen, M. & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs, and ownership structure. Journal of Financial Economics, 3, 305-60.
[21] Ju, N. & Yang, H. O. (2006). Capital structure, Debt Maturity and Stochastic Interest Rates. Journal of Business, 79, (5), 2469-2502.
[22] Keynes, J. M. (1960). The general theory of employment, interest and money. New York, Harcourt, Brace.
[23] Keynes, J.M. (1976). The general theory of employment, Interest and money. London Macmillan.
[24] Kothari, C. (2010). Research Methodology: Methods and Techniques, Mumbai: New Age International publishers.
[25] Leland, H. E. & Toft, K. (1991). Optimal Capital structure, Endogenous Bankruptcy, and the Term Structure of credit spreads. Journal of finance, 51, 987-1019.
[26] Matemilola, B. T. & Arrifin, B. (2011). Pecking Order Theory of Capital Structure, Empirical Evidence from Dynamic Panel Data, International Journal on GSTF, 1(1), 185-189
[27] Miller, M. & Scholes, M. (1978). Dividends and Taxes. Journal of Financial Economics, 6, 333-364
[28] Modigliani, F. & Miller, M. H. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. The American Economic Review, 53, 433-443.
[29] Mutegi. L. M. (2018). Effect of capital structure on financial performance of firms listed at NSE, unpublished research
[30] Mwangi, L.W., Makau, S. M. & Kosimbei, G. (2014). Relationship between capital structure and performance of non-financial companies. Global journal of contemporary research in accounting, Auditing and business ethics, 72-90.
[31] Myers, S. C. & Majluf, N. S. (1984). Corporate Financing and Investment Decision when Firms have Information that Investors do not have. Journal of Financial Economics, 13, 187 – 221.
[32] Nadeem, A. H. & Zongjun, W. (2012). The impact of capital structure on performance. International Journal of Commerce and Management, 23, (4), 354-368.
[33] Nairobi Securities Exchange, (2021). hppt://www.nse.or.ke)
[34] New York Securities Exchange, (2017). hppt://www.nyse.com
[35] Nassar J. (2016). The impact of capital Structure on financial performance of firms. Journal of business and financial affairs 5(2).

[36] Nejadmalayeri, A. (2000). Internationalization, capital structure and cost of capital: evidence from French corporations. Journal of Multinational Financial Management,1, 153-169.
[37] Njoroge, F.K. (2013). The relationship between interest rates and financial Performance of firms listed at the Nairobi securities Exchange, (unpublished), 1-57
[38] Ongweso, A. B (2006). The relationship between interest rate and non-performing loans in commercial banksin Kenya. (unpublished).
[39] Otieno, L. (2015). The Relationship between Capital Structure, Performance and Replacement of CEO in Firms Listed on the Nairobi Securities Exchange. University of South Africa, Pretoria.
[40] Rios-Avila F., Siles L. & Canavire-Bakarreza G. (2024). Estimating Quantile Regression with Multiple Fixed Effects, IZA Institute of Labor Economics, 17262, 1-36.
[41] Ross S. (1977). The Determination of Financial Structure: The Incentive Signaling Approach. Bell Journal of Economics, 8, 23-40.
[42] Saad N.M. (2010). Corporate Governance Compliance and the effect of capital structure, International Journal of Finance and Economics 2(1), 105-114.
[43] Sekaran, U. (2003). Research Methods for business, a skill building approach, (4th Ed), Hermitage Publishing Services.
[44] Shuetrim, G., Lowe, P. & Moring, S. (1998). The determinants of Corporate Leverage, A panel data analysis. RBA Research Discussion papers, Reserve bank of Australia.
[45] Staking, K & Babbel, D. (1995). The relationship between capital structure, interest rate sensitivity and market value in the property liability insurance industry. The journal of risk and insurance, 62, (4), 690-718
[46] Titman, S. & Grinblatt, M., (1989). Performance evaluation: old issues and new insights the review of financial studies,2, (3) 393-421
[47] Tonui, F.C. (2018). The effect of capital structure on value of the firms listed at NSE, Unpublished research.
[48] Tores-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects Using Data. Otorres Princeton, 6, 1-52.
[49] Willem, N. (1995). Financial liberalization and interest rate risk management in sub-Saharan Africa. Oxford Centre for the study of African economies, institute of economics and statistics, University of Oxford.
[50] Wulandari, D. & Harjito, A. (2021). The effect of interest rates, exchange rates and capital structure. International journal of research in business and social science,10, (3), 338-351
[51] Yustisiana, R. (2020). The influence of interest rate, investor expectations and capital structure on the stock price. Journal of business and management, 22, (3), 27-35.