

Research Article

Advances in Neurology and Neuroscience

Capital Structure, Firm Size and Profitability of Insurance Companies Listed on the Nairobi Stock Exchange in Kenya

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Submitted: 2026, Jun 02; Accepted: 2026, Jun 29; Published: 2026, Jul 09

Citation: Christopher, L. M., Njogo, M. (2026). Capital Structure, Firm Size and Profitability of Insurance Companies Listed on the Nairobi Stock Exchange in Kenya. *Adv Neur Sci*, 9(3), 01-08.

Abstract

The study looked at the effect of capital structure on profitability of insurance companies quoted on the Nairobi Securities Exchange (NSE) with size of the company used as a moderating variable and underwriting risk (loss ratio) as a control variable. Equity capital, long-term debt and short-term debt were theoretically defined as the main elements of the capital structure that affect the financial performance of the firm. The study was based on the theories of trade-off theory, pecking order theory and agency cost theory. The research design employed in this study was panel research design with secondary data gathered from five listed insurance companies in the period of 2015-2024. We used Fixed Effects regression with robust standard errors in STATA 17 to analyze the data. The other findings showed that long-term debt ($\beta = 0.0643$, $p = 0.625$) and short-term debt ($\beta = 0.1058$, $p = 0.243$) have positive relationships with profitability but were not statistically significant. A positive but insignificant effect was found for underwriting risk ($\beta = 0.2350$, $p = 0.150$) on profitability. The results also indicated that about 33% of the differences in profitability could be explained by the unobserved organizational characteristics, or firm-specific effects ($p = 0.3308$). The results indicate that the components of capital structure have positive association with profitability but they are not significant factors of performance for all the NSE-listed insurance companies. The study concludes that profitability in the insurance sector in Kenya is more a function of the operation and strategies of the firm than financing decisions. Based on the study, the following recommendations are made to achieve better profitability: insurance companies need to prioritize efficient capital allocation, debt management, prudent debt policies, and good corporate governance. Governments need to bolster insurance sector regulation and encourage risk-based capital management systems to enhance insurance stability.

Keywords: Capital Structure, Profitability, Equity Capital, Long-Term Debt, Short-Term Debt, Insurance Companies, Nairobi Securities Exchange, Underwriting Risk, Firm Size

1. Introduction

Profitability is one of the most crucial indicators of an insurance company's financial sustainability and operational efficiency, as it plays a vital role in ensuring that the insurance company can fulfill its policyholder commitments, stay solvent, compete in the market, and produce value for its shareholders. But many insurers are still dealing with inconsistent earnings because of increasing claims expenses, underwriting inefficiencies, fluctuating investment performance and economic conditions. Capital structure is one of the key factors that contributes to profitability as it is defined as the mix of debt and equity funds required to run and invest in a firm. Choices over equity capital, long-term debt and short-term debt have an impact on the cost of capital, financial risk exposure,

liquidity, and long-term financial stability of insurers [1]. Relying too heavily on debt financing can lead to higher interest costs and risk of financial distress, while robust equity financing can improve solvency and financial stability in uncertain economic times. Empirical studies also found that the leverage decisions have significant impact on profitability especially in highly regulated industry like insurance industry where companies are expected to keep a healthy capital base [2]. For this reason, the capital structure is still a key element in the financial performance of insurance companies.

Empirical evidence from other countries shows that the capital structure – profitability relationship is different across country due

to different economic, institutional and regulatory environment. Trade-off theory assumes that companies try to achieve the optimal mix of debt and equity financing, balancing the tax benefits of debt with costs of bankruptcy and financial distress [3]. In the same way, the pecking order theory holds that high yielding companies have preference to funding themselves from retained earnings over borrowing as it raises financing costs and risk exposure [14]. Previous empirical studies in developed and emerging countries suggest that businesses that leverage their capital optimally tend to be more profitable, whereas businesses that leverage the capital too much face the problem of lower profitability due to higher financing costs and less financial flexibility [5]. These results confirm that the structure of financing is an important choice for firms in the competitive financial market to make to ensure profitability and sustainability.

Market volatility, low insurance penetration, inadequate capital markets and tight insurance solvency regulations are key factors that significantly affect the profitability of insurance companies in the African context. Research in Sub-Saharan Africa has shown that the role capital structure plays in insurer performance is significant, as equity financing and moderate leverage when properly managed has a positive impact on profitability [6]. In Ghana, moderate debt financing was seen to improve profitability, while high leverage did not boost profitability due to high interest payments and financial risk exposure [7]. Likewise, research in Nigeria shows that equity financing and capital reserves have a positive impact on insurer profitability, as internal financing is a leading source of finance for insurers to absorb macroeconomic shocks and market uncertainty [8]. Overall, the results of this analysis suggest that capital structure choices are key to profitability for insurers, though the impact of these choices varies across countries in terms of economic and regulatory conditions.

Although the insurance industry makes significant contribution in financial intermediation, mobilization of savings, risk transfer and effecting economic development in Kenya, the business is still not consistently profitable. The study of Kenyan insurers has found that profitability is strongly affected by leverage, solvency, and capital adequacy such that the insurers with high leverage levels and poor capital adequacy are less profitable as compared to those with high capital buffers and low leverage levels [9]. Morara and Sibindi (2021) also found that firm size is positively correlated with profitability as the larger insurers enjoy the benefits of economies of scale, market reputation, and better risk diversification. Most studies in Kenya, however, have been on overall determinants of profitability without breaking down the capital structure into equity capital, long-term loans and short-term loans. Thus, it is lacking in empirical studies on the effect of these capital structure components on the profitability of insurance companies quoted at the Nairobi Securities Exchange (NSE). This occurs because this gap requires further study on the impacts of equity capital, LT debt, and ST debt on profitability under the moderating influence of firm size.

Financial performance across the insurance sector is greatly affected by the size of a firm and several factors, such as the size of diversification, the size of capital, the size of the market covered by the firm and the capacity of the firm to operate. Many larger insurance companies have larger asset bases and broader product lines, which helps them to better recover from market uncertainties. For example, Jubilee Holdings' asset size was above KES 214 billion in 2024, with significant buffers of capital and diversified investments [10]. Empirical evidence shows that firm size is a positive determinant of profitability of NSE listed insurance companies as larger firms are said to have economies of scale and operational efficiency [11]. However, growth can also lead to operational inefficiencies, higher underwriting risk and managerial challenges if growth is not managed, which will impact profitability [12]. Hence, it was concluded that firm size is still one of the important factors that explain firm capital structure and profitability relationship among insurance companies.

Some of the most frequently used profitability ratios for insurance firms include: return on assets, return on equity, net profit margin, and the underwriting profit ratio. It's a reflection of insurers' capacity to make sustainable returns on its business through efficient underwriting, investment management and cost control. Profitability trends among insurance firms traded on the NSE in the last few years seem to vary. Some insurers, including Cytonn Investments and Sanlam Kenya, posted decent returns on equity in 2024, but the sector was still driven by claims pressure and underwriting losses. Claims pressure and underwriting losses remained a drag on the sector's performance, with some insurers, such as CIC Insurance and Sanlam Kenya, reporting relatively strong returns on equity in 2024. Similarly, Kenya Reinsurance Corporation also recorded higher profitability in 2025 attributed to higher investment returns, despite the challenges being faced in underwriting due to growing claims expenses [13]. The overall developments suggest that the profitability of the insurance industry in Kenya is still not stable and could be affected by financing structure choice and industry-specific operating characteristics.

Profitability is one of the most significant measures of the financial condition and the sustainability of insurance companies since it's vital for the fulfillment of policyholder obligations, for maintaining their solvency and for generating value for shareholders. Although insurance has been one of the important sectors in the Kenya economy, listed insurance companies on the Nairobi Securities Exchange (NSE) are still having inconsistent profitability due to increased claim costs, inefficient underwriting, high operating costs and volatile investment income. The Insurance Regulatory Authority (IRA, 2025) reports that a few insurers are still suffering losses with combined ratios above the breakeven point, meaning that losses and operating costs outweigh underwriting income. Likewise, the return on assets of listed insurers decreased sharply from 2015 to 2020, which is a matter of concern for the financial sustainability and operational efficiency of listed insurers [13].

The proportion of equity capital, long-term debt and short-term debt financing is one of the main factors that is related to these

profit fluctuations. This could lead to higher interest payments and stress on financial stability, while robust equity financing can boost a company's solvency and weather economic storms [1]. While some listed insurers have reported improved profits in recent years, the majority of this has been due to investment income and not underwriting income, leading to concerns about the effectiveness of the current financing structures to support long-term profitability [13]. There is considerable empirical uncertainty on how profitable insurers are in Kenya despite the many studies that have been carried out on the subject. Previous studies have concentrated on leverage, solvency or overall determinants of financial performance but haven't separated the impacts of equity capital, long-term debt and short-term debt. Martin (2020) examined leverage and profitability of insurers and didn't differentiate between long-term debt financing and short-term debt financing [15]. A study by Kamanda and Sibindi (2021) did not include firm size as a moderating variable, nor did Morara and Sibindi (2021) include individual capital structure components in their analysis of the solvency and underwriting risk [2,16]. Moreover, there is little research that has focused exclusively on insurance companies listed on the NSE which has specific disclosure and governance requirements.

Thus, the link between capital structure and profitability of NSE-listed insurance companies is still not well understood, especially with the firm size and underwriting risk. This study aimed to investigate this empirical gap by looking at the impact of equity capital, long term debt and short term debt on profitability of insurance companies listed on the Nairobi Securities Exchange with underwriting risk as the moderating variable and firm size as the control variable. The results will be useful to insurance companies, regulators, policy makers and investors to inform their funding policies to improve profitability, financial stability and sustainable growth for the insurance industry in Kenya.

2. Literature Review

The empirical analysis explores the reported empirical research on the insurance companies' capital structure and profitability relationship in various countries and institutional settings. Previous researches have yielded conflicting results on the effects of equity capital, long-term debt, short-term debt and the size of the company on financial performance and this calls for more empirical research, especially in the insurance industry in Kenya. There are a number of studies that have considered how equity capital affects profitability and financial stability of financial institutions and insurance companies. Abbas et al. (2021) investigated the effect of capital adequacy ratios on risk-taking behavior of large commercial banks in the USA for the period 2002-2018 using two-step system GMM model [17]. The study revealed that the higher the capital position, the less the risk exposure, but at the same time it could be an overcapitalization that might result into inefficiencies. The study is significant in its findings that the strength of capital is important in improving financial stability, but has not actually considered insurance companies as a sample instead of banks, and has not directly examined the financial indicators that could be used to measure profitability like ROA or ROE. Likewise, Ye et al.

(2021) analysed the impact of COVID-19 on equity performance of the top health insurance companies in China and found that the market shock had a significant impact on equity performance and investor confidence [18]. The study, however, was conducted on the forecasting of stock prices and not on profitability and the study would not include any analysis of capital structure variables like debt financing and equity financing.

Mndayi (2023) examined the determinants of the profitability of insurance companies listed in the Johannesburg Stock Exchange in South Africa from 2008 to 2019 using panel regression analysis, in an African context [19]. The results indicated that leverage and liquidity had a significant impact on profitability, whereas firm size and premium growth did not have a significant impact. The study found that financial structure had an impact on the profitability of insurers, but did not differentiate between long-term and short-term debt. The study also focused on determinants of profitability of insurance companies in Nigeria by Adewale (2022) which found that leverage, solvency margin, liquidity and underwriting risk had positive relationship with profitability [20]. Despite this, the ROE was used as the core element of the study without differentiating the debt financing into short-term and long-term debt. A similar study by Kamanda and Sibindi (2021) on Profitability and performance determinants of insurance companies in Kenya, revealed that leverage had a positive impact on profitability of these firms and their size had a positive effect on the performance of these firms. The study did not, however, disaggregate debt maturity structure and failed to disaggregate equity capital separately from leverage. The gaps create the rationale for the current study focussing on specific components of the capital structure and profitability of NSE listed insurers.

The empirical results in the literature about the relationship between long-term debt and profitability are mixed as well. Nkansah (2025) examined the effects of debt financing on profitability in the biopharmaceutical industry in the United States and Europe from 2010 to 2020 [21]. The study revealed that long term debt was detrimental to profitability due to higher financial commitments especially following COVID-19. Although the study showed debt maturity structure to be important, it did not apply to regulated insurance markets. Chen and Yang (2023) explored the pricing and solvency of environmental liability insurance in China, and conclude that environmental liability insurance's solvency depends significantly on capital-debt ratio and claim ratios [22]. The study identified capital structure as an important determinant of financial stability but did not consider ROA and ROE, measures of profitability.

Other research also highlights the role of operational efficiency and firm attributes as other factors affecting profitability. According to Ige-Gbadeyan and Swanepoel (2023), financial health of the non-life insurers in SA is adversely impacted by premium growth, indicating that poor performance or underpricing could have a negative impact on profitability [23]. Olulu-Briggs (2024) studied the relationship between debt structure and their value of the insurance companies in Nigeria and concluded that long term

debt and firm size positively affected firm value while short term debt didn't contribute [24]. The study, however, solely employed Tobin's Q rather than accounting-based profitability measures. In a similar study, Martin (2020) found that leverage ratio and underwriting loss ratio had a significant impact on profitability of general insurers in Kenya but did not differentiate between short term and long term debt [15].

Research and studies that have investigated the relationship of firm size and profitability have generally found positive relationships. In his study on the determinants of profitability in the Saudi insurance industry, Ben Dhiab (2021) found that firm size was positively associated with profitability of the insurance companies, but the association was not statistically significant [25]. Firm size, managerial efficiency, leverage and liquidity were also found to have significant impacts on profitability of Ethiopian insurers by Worku, Bayleyegne and Tafere (2024) [26]. Morara and Sibindi (2021) found economies of size and increased market power effects to be drivers of higher profitability in larger insurance companies in Kenya. Still, these studies did not examine the moderation effect of firm size on the capital structure - profit relationship [2].

In summary, the empirical studies reviewed established that capital structure, leverage, firm's solvency, liquidity and firm size are important determinants of profitability of insurance firms. The results, however, are inconclusive because of variations in methodology, industry, and economic conditions. Most of the studies have considered leverage as one variable and not separated it into equity capital, long-term debts and short-term debts. Moreover, few studies have concentrated specifically on insurance companies listed on NSE, while moderating variable of firm size and control variable of underwriting risk have been introduced in the study. For this reason, the current study aims to close this gap in the empirical literature by investigating the impact of equity capital, long-term debt and short-term debt on profitability for the listed insurance companies in the Nairobi Stock Exchange in Kenya.

2.1. Hypotheses Development

Based on the reviewed literature and theoretical foundations, the study proposes the following hypotheses:

H01: Equity capital has no significant effect on profitability of insurance companies listed on the Nairobi stock exchange in Kenya.

H02: Long-term debt has no significant effect on profitability of insurance companies listed on the Nairobi stock exchange in Kenya.

H03: Short-term debt has no significant effect on profitability of insurance companies listed on the Nairobi stock exchange in Kenya.

H04: Firm size has no significant moderating effect on the relationship between capital structure and profitability of insurance companies listed on the Nairobi stock exchange in Kenya.

3. Theoretical Review

The study is grounded on four primary theories: Trade-Off Theory,

Pecking Order Theory, Agency Theory and Resource-Based View. These theories give a complete explanation on the relationship between the capital structure and profitability of insurance companies quoted on Nairobi Securities Exchange (NSE). All the theories provide an understanding of how the firms make financial decisions, how they balance risk and return, how they manage governance issues, and how they leverage their internal resources to boost profits. Kraus and Litzenberger (1973) and Modigliani and Miller (1963) developed it under the name of the Trade-Off Theory, which became more detailed in 1963 by the addition of taxes to capital structure decisions [27,3]. According to the theory, companies attempt to achieve a mix that is optimal between the advantages and the expenses of debt financing and the expenses from financial distress and bankruptcy. The theory states that debt financing offers benefits in terms of tax because the interest payments can be deducted from the income of the host and thus increase the shareholder returns. Yet borrowing too much spells trouble for a company, and especially in insurance, a lot of regulation can put them at risk of bankruptcy. Recent research indicates that insurers leverage up when economic conditions are good to make profits, but when they are not, they borrow less to ensure that their capital and their solvency are adequate [2]. The relevance of theory to this study is that insurance companies on the NSE are supposed to have a mix of equity capital, long-term debt and short-term debt which will ensure the company maximises profit and minimises financial risk. But critics state that the theory assumes that firms can determine an optimal capital structure, which may not be feasible in an insurance company, since markets are so volatile and unpredictable.

Myers and Majluf (1984) were the originators of the Pecking Order Theory, which is an extension of the earlier theory from Donaldson (1961) [4,28]. The theory is that companies look for the most convenient source of capital funds, starting from internal, then debt and finally external equity. This preference is mainly influenced by information asymmetry between managers and investors. The theory suggests that profitable companies would like to finance their own business using the retained income, since the transaction costs and the disclosure requirement of the external financing are lower. Debt financing is better than equity financing because it may help indicate the financial weakness or overvaluation of the company to the investors. Retained earnings and equity financing are also common choices in the insurance sector to ensure a firm's solvency, as well as to avoid costly borrowing rates. The empirical studies in African insurance markets have shown that the insurance companies prefer to finance internally because of the high interest rate and financial uncertainty of external debt [29]. This theory is applicable to this study since it helps to understand why successful insurance companies can finance themselves more by equity capital than debt. The theory has been criticized however, for its simplicity as firms could use a combination of financing sources depending on the market conditions and regulations.

Jensen and Meckling (1976) proposed Agency Theory to explain conflicts that occur between managers and shareholders as a result of the separation of ownership and control [30]. The theory

suggests that managers can have an interest that might clash with the maximisation of shareholder wealth which may give rise to agency costs. Debt financing can mitigate agency problem by curbing managers' excess cash and adding monitoring by the lenders. But too much debt can lead to the managers taking on too many risks that end up jeopardizing the firm's stability. Agency conflict is a major concern in insurance firms since managers have to take a lot of decisions related to underwriting, investments, and claims handling, all of which affect the profitability and solvency of the firm. Empirical studies in recent years suggest that better governance and optimal debt reduces the profitability of a firm [31]. The theory is relevant to this study because the authority of the financing decision (equity capital, long-term debt and short-term debt) can impact the managerial decision making and in-turn profitability. Size also moderates the effect, as larger firms will likely have better governance systems, which will lessen agency conflicts. But some sceptics of the theory say it is too much attention is paid to managerial opportunism and not enough to institutional and behavioural factors that influence corporate decisions.

The Resource-Based View (RBV) of Barney (1991) defines that companies can have sustainable competitive advantage based on valuable, rare, inimitable and non-substitutable resources [32]. The theory suggests that the internal components, including financial resources, managerial know-how, technology, distribution systems and underwriting skills, are major factors in achieving superior performance. Within the insurance sector, larger companies are likely to have more diversified products, capital base and advanced technology and market coverage, which helps them to make best use of the financing resources. The theory thus lends credibility to the moderating effect of firm size on the association between capital structure and profitability. Larger insurers are likely to have better financial shock absorption capacity than smaller companies, and to be able to handle leverage more effectively, on account of their greater resources. But critics say that it is not easy to implement RBV because valuing intangible resources is difficult, and some of the resources can lead to profitability which in turn can cause the resources to be accumulated.

The overall conclusion is that the four theories give complementary explanations of the relationship between capital structure and profitability of insurance companies. Trade-Off Theory accounts for the debt benefits/financial distress costs, Pecking Order Theory accounts for financing preferences, Agency Theory accounts for governance and managerial incentives, and the Resource-Based View accounts for the influence of the firm-specific resources and firm size on profitability. In summary, these theories give a good theoretical basis to use in the study of the effect of equity capital, long-term debt, short-term debt and firm size on the profitability of insurance companies quoted on the Nairobi Securities Exchange.

4. Materials and Methods

The study used correlational research design to investigate the relationship between capital structure and profitability performance of insurance companies quoted on Nairobi Securities Exchange (NSE) in Kenya. This paper used a correlational design

to allow the researcher to evaluate and describe the relationship between the variables without intervening in them [32,33]. The study specifically examined the effect of equity capital, long term debt and short term debt on profitability ratios like ROA, ROE and NPM. The use of secondary quantitative data derived from financial statements and annual reports for the last 10 years 2015-2024 was appropriate for the study. The cross-sectional and time-series nature of the firms could also be analyzed in the study, thanks to the use of panel data.

All the insurance companies under the regulation of the Insurance Regulatory Authority (IRA) in Kenya during the study period were the target population. The study however targeted insurance companies quoted on the Nairobi Securities Exchange due to the fact that they were quite constant in the information they disclose, they have access to their audited financial statements and follow regulatory requirements. The listed companies had Jubilee Holdings, Britam Holdings, CIC Insurance Group, Sanlam Kenya Holdings and Liberty Kenya Holdings. An emphasis was placed on listed insurers to increase the reliability and comparability of financial information analyzed.

The research was conducted using secondary data which were gathered from audited financial statements, annual reports, publications of the Nigerian Stock Exchange, Nigeria Insurance Regulatory Authority reports and other sources. The main data collection tool was a structured Microsoft Excel worksheet that was used to systematically record and organize the financial data for each variable. The spreadsheet worked well for efficient extraction, coding, and classification of variables relating to profitability, capital structure, firm size, and underwriting risk. The research was undertaken in Nairobi, Kenya through accessing the company websites, NSE databases and IRA publications. All data were recorded on a standardised form for consistency and accuracy.

The data collected were cleaned, coded and analyzed in STATA Version 17. The characteristics of the study variables were summarized by descriptive statistics including the mean, standard deviation, minimum and maximum values. Correlation analysis was also performed in order to ascertain the direction and the magnitude of the relationships among the variables. The study also conducted a panel regression analysis using a Pooled Ordinary Least Squares (POLS), Fixed Effects (FE) and Random Effects (RE) approach. The general regression model tested the effect of equity capital, long-term debt and short-term debt on profitability, firm size served as a moderating variable and underwriting risk (loss ratio) as a control variable. The Hausman test was used to identify the best model, fixed effects or random effects.

Validity and reliability of the regression results were confirmed by several diagnostic tests. Multicollinearity was checked by the Variance Inflation Factor (VIF) with values greater than 10 considered as high collinearity among independent variables. Tests for heteroskedasticity include the Breusch-Pagan test and the Modified Wald test, while the Wooldridge test was performed on

the autocorrelation test. If needed, strong standard errors were used to adjust estimation error. Normality tests were also performed using the Shapiro-Wilk test and stationarity tests were performed using the Levin-Lin-Chu (LLC) and the Im-Pesaran-Shin (IPS) unit root tests. These tests helped to confirm the assumptions of panel regression analysis and increased the reliability of the results. Ethical issues were adhered to during the research process. This study was based on secondary data, which was derived from various financial statements and regulatory publications that were accessible to the public, thus reducing the ethical implications of direct human contact. Research did not violate academic honesty rules in citing all sources of data and maintaining objectivity in analysing and interpreting the research results.

5. Results and Discussions

5.1. Descriptive Results

The descriptive statistics for the study variables using panel data from five insurance companies listed on the Nairobi Securities Exchange (NSE) for seven years 2015 to 2024 are presented in

Table 1. The findings show moderate difference in the profitability and capital structure indicators. The mean profitability was 0.1659 while the standard deviation was 0.0965, indicating that listed insurers earned an average of about 16.6% during the study period. The range between the minimum (0.0283) and maximum (0.7067) however, indicates significant variation in actual results from firm to firm and year to year. There was relatively low dispersion in firm size, which suggests that the sampled insurers are structurally stable. Insurers have strong capitalization levels and this is reflected in the mean value of equity capital (10.2757). Insurers were moderately reliant on outside debt for long-term debt and more heavily for short-term debt, indicating that insurers rely more on short-term debt to meet liquidity needs and operational financing needs. The descriptive results indicate that profitability of insurance companies is time-sensitive and differ significantly by company, and the variables of the capital structure are relatively stable, as they are subject to regulatory controls and prudential requirements.

Variable	Mean	Standard Deviation	Minimum	Maximum
Profitability	0.1659	0.0965	0.0283	0.7067
Firm Size	4.5076	0.2086	4.0524	4.9319
Equity Capital	10.2757	0.3286	9.6742	11.0407
Long-Term Debt	0.1717	0.0652	0.0500	0.3010
Short-Term Debt	0.3142	0.0632	0.1553	0.4566

Table 1: Summary Descriptive Statistics for Study Variables (N = 50)

5.2. Inferential Results (Validity Checks, Correlation, and Regression)

Diagnostic testing, correlation analysis and panel regression estimation (Fixed Effects model, with robust standard errors) were used for inferential analysis. The panel model was confirmed to be suitable for analysis by diagnostic tests. The Variance Inflation Factor (VIF) showed that multicollinearity was a problem for equity capital and firm size, but not for the other variables. The Modified Wald test revealed that there is a heteroskedasticity problem ($\chi^2 = 18.47$, $p = .002$), and the Wooldridge test showed that there is autocorrelation in the panel data ($F = 12.63$, $p = .023$). Therefore, the standard errors were clustered at the firm level to correct estimation biases, leading to strong standard errors. The Hausman specification test was statistically significant ($\chi^2 = 12.84$, $p = .025$), indicating that the Fixed Effects model is more suitable than the Random Effects model, since the unobserved firm-specific characteristics are correlated with the explanatory variables.

The results of the correlation analysis indicated moderate positive correlation between profitability and equity capital ($r = .407$), profitability and firm size ($r = .399$), and profitability and short term debt ($r = .396$), but the correlations were not statistically significant. There was a very strong positive correlation between equity capital and firm size ($r = .972$, $p < .001$) meaning that larger insurers are more likely to have higher levels of capitalization because of regulatory requirements for the firm's solvency. The results of the regression showed that equity capital, long-term debt and short-term debt had positive and insignificant effects on profitability. Another insignificant positive coefficient ($\beta = 0.2350$, $p = .150$) was observed for the variable underwriting risk. The model also found that the unobserved operational and managerial characteristics, or the firm-specific effects ($\rho = 0.3308$), explained about 33% of the variability of profitability. Overall, the results indicate that variables of the capital structure are not statistically significant in determining profitability of the NSE listed insurers.

Component	Statistic	Result
Multicollinearity	Mean VIF	11.23
Heteroskedasticity	Modified Wald $\chi^2(5)$, p	18.47, $p = .002$
Autocorrelation	Wooldridge $F(1,4)$, p	12.63, $p = .023$
Hausman Test	$\chi^2(5)$, p	12.84, $p = .025$

Correlation	Profitability ↔ Equity Capital	r = .407
	Profitability ↔ Firm Size	r = .399
Regression Model Fit	Within R ²	0.0768
	Between R ²	0.0270
	Overall R ²	0.0179
	Prob > F	0.0000
Regression Coefficients	Equity Capital β (p)	0.0717 (0.119)
	Long-Term Debt β (p)	0.0643 (0.625)
	Short-Term Debt β (p)	0.1058 (0.243)
	Underwriting Risk β (p)	0.2350 (0.150)
Firm-specific Effects	rho (ρ)	0.3308

Table 2: Inferential Statistics Summary (Diagnostic Tests, Correlation, and Regression) (N = 50)

Regression Equation

$$PROFit = -0.3774 + 0.0717ECit + 0.0643LTDit + 0.1058STDit + 0.2350URit + \varepsilon it$$

6. Conclusions

The study was undertaken to determine the impact of capital structure on profitability of insurance companies quoted on Nairobi Securities Exchange (NSE), Kenya. The results revealed that equity capital, long term debt and short term debt had positive but non-significant relationships with profitability. This suggests although financing structure can be an enabler for financial stability and flexibility for listed insurers, it alone cannot drive profitability results. Additionally, the study proved that the influence of underwriting risk on profitability is positive but insignificant, implying that operational efficiency, governance, and management are important factors affecting the variance in profitability, and they account for around one-third of this variance [35]. In general, the results indicate that profitability of insurance firms in Kenya is more influenced by the management strategies adopted by the firms and their internal operations than by leverage. The findings reinforce the point that prudent underwriting, risk management and efficiency of the use of the resources are more important for sustainable profitability than the changes in capital structure.

Recommendations

Insurance companies should prioritize building up operational efficiency, underwriting discipline, and claims management while not overemphasizing leverage adjustments to drive profitability. A strategic allocation of equity capital should be directed to productive investments, technological innovation and further improvements in the process to boost long-term performance. Insurers should also observe an appropriate scheme of debt management which takes account of the need for insurance companies to maintain their solvency requirements and financial stability. Sectoral resilience should be further boosted through continued strengthening of risk-based capital frameworks, corporate governance standards and enterprise risk management systems by regulators like the Insurance Regulatory Authority (IRA). Furthermore, policymakers should promote digital transformation, promote

actuarial capacity building, and digitalize underwriting systems to enhance the efficiency and profitability of the insurance sector as a whole. Future research could extend to the non-listed insurers, cover macroeconomic variables, and explore nonlinear capital structure-profitability relationships to make more comprehensive conclusions.

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