

SHORT-TERM DEBT, PROFITABILITY, AND STOCK MARKET VOLATILITY AT THE NAIROBI SECURITIES EXCHANGE, KENYA

Vivyanne Omira^{1*}, Isaac Linus Ochieng², Gordon Opuodho³
^{1,2,3}Jomo Kenyatta University of Agriculture and Technology, Kenya

Corresponding Author:
omiravivyanne@gmail.com

Abstract

This study examines the relationship between short-term debt and stock market volatility among firms listed on the Nairobi Securities Exchange (NSE) in Kenya. Acknowledging the increased sensitivity of emerging markets to external financial shocks, the research aims to clarify how short-term financing affects market dynamics. Using secondary data from the NSE and company financial reports covering the period from 2013 to 2022, the study employs a quantitative approach that incorporates multiple linear regression, Pearson correlation analysis, and panel random effects models to capture both cross-sectional and time-series variations. The findings reveal a cyclical pattern in short-term borrowing and a strong positive relationship between short-term debt and market volatility. Regression analysis, which considers firm size and profitability, further confirms that short-term debt has a statistically significant positive impact on volatility. This suggests that short-term financing contributes to market instability when firm-specific factors are taken into account. The persistent presence of short-term debt in corporate capital structures underscores its strategic importance. These results highlight the need for investors and policymakers to carefully monitor corporate debt profiles to mitigate volatility risks in emerging financial markets.

Keywords: Short-Term Debt, Stock Market Volatility, Profitability, Firm Size, Nairobi Securities Exchange.

1. Introduction

Stock market volatility serves as a crucial barometer of financial risk and market sentiment, exerting profound influence on investment decisions, capital allocation efficiency, and overall economic stability (Dhingra et al., 2024). In emerging markets like Kenya, heightened volatility presents particularly acute challenges, creating uncertainty that can erode investor confidence, reduce market participation, decrease liquidity, and ultimately impede economic growth (Otaify, 2015; Owidi & Mugo, 2016). The Nairobi Securities Exchange (NSE), as East Africa's premier capital market platform, exemplifies these challenges, with recent reports indicating that approximately 80% of Kenyan investors exhibit risk-averse behavior, making market stability an imperative concern for sustainable economic development (NSE, 2021). This risk aversion is particularly problematic in an emerging market context where stable investment patterns are essential for long-term growth and development.

The intricate relationship between corporate financing decisions and market volatility represents a critically under-explored domain in emerging market finance, particularly in the African context. While substantial global research has examined broad capital structure effects on firm performance, the specific impact of short-term debt financing on stock market volatility within the Kenyan context constitutes a significant knowledge gap that demands urgent scholarly attention. The existing international literature reveals fundamentally contradictory perspectives and empirical findings, with some studies

suggesting that short-term debt amplifies volatility through refinancing risks and financial pressures (Vuong et al., 2023; Chen et al., 2014), while others indicate either negative or negligible relationships, potentially attributable to signaling effects or optimal capital structure conditions under specific circumstances (Mwambuli & Kimani, 2024; Baker & Wurgler, 2002). These conflicting results highlight the context-dependent nature of the relationship and underscore the need for market-specific investigations.

The NSE's distinctive market microstructure characterized by its evolving regulatory framework, predominance of risk-averse investors, relatively low market capitalization, and heightened sensitivity to both domestic and global macroeconomic shocks create a unique financial ecosystem that may fundamentally alter conventional relationships between corporate debt financing and market behavior observed in developed markets. Despite the exchange's strategic evolution, including the implementation of automated trading systems in 2006 and its subsequent rebranding as the Nairobi Securities Exchange, market data reveals troubling trends of declining investor participation and liquidity concerns (CMA, 2022), underscoring the urgent need to better comprehend the fundamental drivers of market volatility in this specific context. The exchange's composition, with 65 listed companies across various sectors, and its unique index structures further complicate the volatility dynamics in ways that may differ significantly from more mature markets.

This study addresses several critical research gaps by conducting a rigorous empirical investigation of the impact of short-term debt on stock market volatility within Kenya's distinctive financial environment. The research employs robust panel data methodologies to account for firm-specific heterogeneity and potential endogeneity concerns that have plagued previous studies in this domain. Furthermore, it incorporates the unique institutional characteristics of the NSE, including its market composition, investor behavior patterns, and regulatory environment, which have been largely overlooked in existing literature. The investigation also considers the temporal dimension of this relationship, examining how the debt-volatility nexus may have evolved through various market cycles and regulatory changes in the Kenyan context.

The findings of this comprehensive study will provide context-specific evidence that can inform corporate financial strategies, guide investment decisions, and shape regulatory policies, ultimately contributing to enhanced market stability, improved resource allocation efficiency, and sustainable development of Kenya's evolving financial markets. By bridging the theoretical and empirical gaps in understanding the debt-volatility nexus in emerging African markets, this research makes significant contributions to both academic knowledge and practical market governance. The study's implications extend beyond Kenya to other emerging markets facing similar challenges of market development, investor protection, and financial stability maintenance in the face of increasing global financial integration and macroeconomic uncertainties.

Moreover, this research responds to the call for more localized financial research in African markets, which have historically been under-represented in mainstream financial literature despite their growing importance in the global economic landscape. The unique combination of market characteristics, regulatory environment, and investor behavior in Kenya provides an ideal laboratory for testing established financial theories and potentially developing new insights that could enrich our understanding of emerging market finance more broadly. The study's methodological rigor and context-specific focus set it apart from previous research and position it to make meaningful contributions to both theory and practice in African financial market development.

2. Theoretical Background

2.1 Agency Theory

This study employs Agency Theory (Jensen & Meckling, 1976) as its theoretical foundation to examine the relationship between short-term debt and stock market volatility. The theory addresses conflicts of interest between principals (shareholders) and agents (managers), where managers may prioritize personal interests over shareholder value maximization (Shikumo, 2023). Agency Theory suggests that debt financing serves as a disciplinary mechanism that aligns managerial interests with those of shareholders. The mandatory interest and principal payments reduce free cash flow available for managerial discretion, while the associated bankruptcy risk incentivizes managers to enhance operational efficiency and pursue value-maximizing projects (Grigore & Stefan-Duicu, 2013). Short-term debt, with its immediate repayment obligations, creates particularly strong incentives for financial discipline and performance improvement. While Agency Theory has been criticized for its narrow focus on shareholder interests and oversimplified view of corporate relationships (Segrestin & Hatchuel, 2011), it provides a robust framework for understanding how short-term debt can influence firm risk and market perceptions. In this study, Agency Theory explains how short-term debt may affect stock market volatility through its role in mitigating agency conflicts and shaping corporate risk profiles (Vuong et al., 2023).

2.2 Conceptual Framework

The conceptual framework for this study illustrates the proposed relationship between short-term debt and stock market volatility, mediated by agency cost reduction and moderated by firm-specific characteristics. The framework positions short-term debt as an independent variable influencing stock market volatility as the dependent variable, with agency costs serving as the mediating mechanism and firm size, profitability, and growth opportunities acting as contextual moderators.

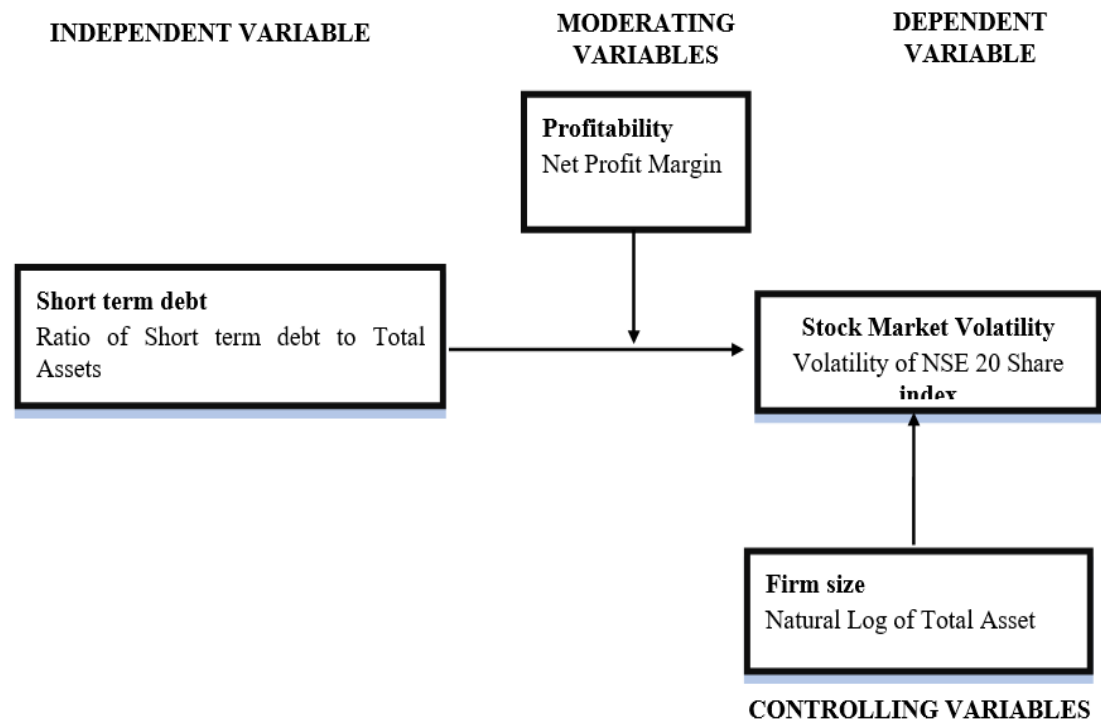


Figure 1. Conceptual Framework

2.3 Empirical Review and Hypothesis Development

2.3.1 Empirical Review

The empirical literature reveals conflicting perspectives on the relationship between debt financing and stock market volatility. Several studies support a negative relationship, consistent with pecking order and trade-off theories. Chen et al. (2014) found that stock return volatility negatively correlates with short-term debt, as volatile firms anticipate lower future earnings and face higher external financing costs, leading them to reduce optimal debt ratios. This finding aligns with Smith and Yamagata (2011), who observed a persistent negative impact of stock market volatility on leverage, and Levine and Wu (2016), who noted that volatility during corporate mergers prompts debt reduction to avoid default risk.

Conversely, substantial evidence supports a positive relationship between leverage and volatility. Karimi (2020) documented a significant positive effect of financial leverage on stock price volatility in the Tehran Stock Exchange, while El Alaoui et al. (2017) reported similar findings for European firms, noting a non-linear relationship where highly leveraged firms exhibited greater volatility. Vuong et al. (2023) found that short-term market leverage positively impacts stock market volatility in Chinese markets, attributing this to liquidity and refinancing risks. Similarly, Cheng et al. (2020) demonstrated that using short-term debt to finance long-term investments increases volatility in Chinese markets, and Al-Najjar and Hussainey (2011) identified a positive association in UK firms.

The empirical landscape is further complicated by contradictory findings. Nijenhuis (2013) and Tongkong (2012) found no significant relationship, while Mwambuli and Kimani (2024) reported a negative impact of short-term debt on volatility in the Dar es Salaam Stock Exchange, suggesting potential contextual variations. These conflicting results underscore the need for context-specific investigation in the Nairobi Securities Exchange.

2.3.2 Hypothesis Development

Based on Agency Theory and the empirical review, this study proposes the following hypothesis: *H1: Short-term debt has a significant positive impact on stock market volatility at the Nairobi Securities Exchange.*

This hypothesis is grounded in the premise that short-term debt, through its refinancing requirements and associated financial pressures, increases firm risk perceptions among investors, thereby amplifying stock price fluctuations. The Agency Theory perspective suggests that while short-term debt may reduce certain agency costs, the increased bankruptcy risk and financial fragility it creates may ultimately contribute to greater market volatility, particularly in emerging markets like Kenya characterized by information asymmetry and limited financial flexibility.

3. Methods

3.1 Research Design

This study adopted a positivist research paradigm with a causal research design to examine the relationship between short-term debt and stock market volatility. The research utilized a quantitative approach with panel data analysis to establish causal relationships between the variables under investigation.

3.2 Population and Sample

The study population consisted of all companies listed on the Nairobi Securities Exchange (NSE). The final sample included 60 firms that were actively operating and had complete data for the period from 2013 to 2022, resulting in a balanced panel dataset with 600 firm-year observations.

3.3 Data Collection and Sources

The research relied on secondary data collected from multiple sources:

- 1) Yearly short-term debt and firm size data from company financial statements
- 2) Monthly NSE-20 share index data from the Nairobi Securities Exchange
- 3) Data covering the 10-year period from 2013 to 2022

3.4 Analytical Techniques

Data analysis in this study employed a comprehensive quantitative approach using panel data regression analysis with multiple sophisticated techniques. The primary analytical framework utilized panel data regression models, with the Random Effects Model (REM) serving as the main estimation method after rigorous diagnostic testing. Model selection was determined through Breusch-Pagan LM and Hausman tests conducted at the 5% significance level, where the Hausman test specifically compared fixed effects versus random effects models, with a p-value below 5% indicating preference for fixed effects.

To capture the dynamic nature of stock market volatility, the study incorporated a Generalised Autoregressive Conditional Heteroskedasticity (GARCH 1,1) model, which effectively accounts for time-varying volatility patterns. The general model specification was expressed as:

$$Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 Z_i + \beta_4 (X1_{it} Z_i) + \beta_5 (X2_{it} Z_i) + u_i + \epsilon_{it}$$

Where:

- Y_{it} = Dependent variable for entity i at time t
 $\beta_0, \beta_1, \beta_2, \dots, \beta_5$ = Beta Coefficients
 $X1_{it}$ = Short-term debt for entity i at time t
 $X2_{it}$ = Firm size (control variable)
 Z_i = Profitability (moderating variable)
 u_i = Firm-specific random effect
 ϵ_{it} = Idiosyncratic error term

A thorough series of diagnostic tests ensured model validity and reliability. The linearity assumption was verified using Ramsey's RESET test, while normality of residuals was assessed through the Jarque-Bera test, appropriate for the 600-observation sample size. Multicollinearity was examined using Variance Inflation Factor (VIF) with a threshold of 5, and heteroscedasticity was tested via the Breusch-Pagan test. Serial correlation was detected using Durbin-Watson and Breusch-Godfrey tests, and stationarity was confirmed through panel unit root tests. The study also incorporated firm size as a control variable and profitability as a moderating variable to examine interaction effects within the volatility framework.

4. Results and Discussion

4.1 Descriptive Statistics and Trend Analysis

Table 1. Descriptive Statistics

Variable	Mean	Std. Deviation	Min.	Max.	Observations
Short Term Debt	0.396	0.403	0.001	5.420	600
Firm Size	16.553	2.399	8.850	12.990	600
Profitability	0.322	4.775	-34.220	119.750	600
Stock Market Volatility	0.374	0.032	0.340	0.440	600

Source: Research Data (2023)

The descriptive statistics for all variables used in the study are presented in Table 1. Analysis of 600 firm-year observations from the Nairobi Securities Exchange (NSE) reveals a strong reliance on short-term debt, with a mean value of 0.396. This indicates that, on average, nearly 40% of the capital structure of listed firms is financed by short-term obligations. The high standard deviation (0.403) and a wide range (0.001 to 5.42) suggest significant variation in borrowing behaviour across firms and time. The high positive skewness (5.82) and kurtosis (64.16) for short-term debt indicate a non-normal distribution, with most firms clustered at lower debt levels and a few outliers with very high short-term debt.

The descriptive statistics for all variables used in the study are presented in Table 1. To provide a longitudinal perspective on the key variables, a trend analysis was conducted for the period 2013-2022. This analysis offers crucial insights into the dynamic behavior of short-term debt, stock market volatility, firm size, and profitability over a decade, highlighting evolving market conditions and corporate financial strategies at the Nairobi Securities Exchange (NSE). The trends, visualized in Figures 1 through 4, reveal distinct and contrasting patterns that set the context for the subsequent regression analysis.

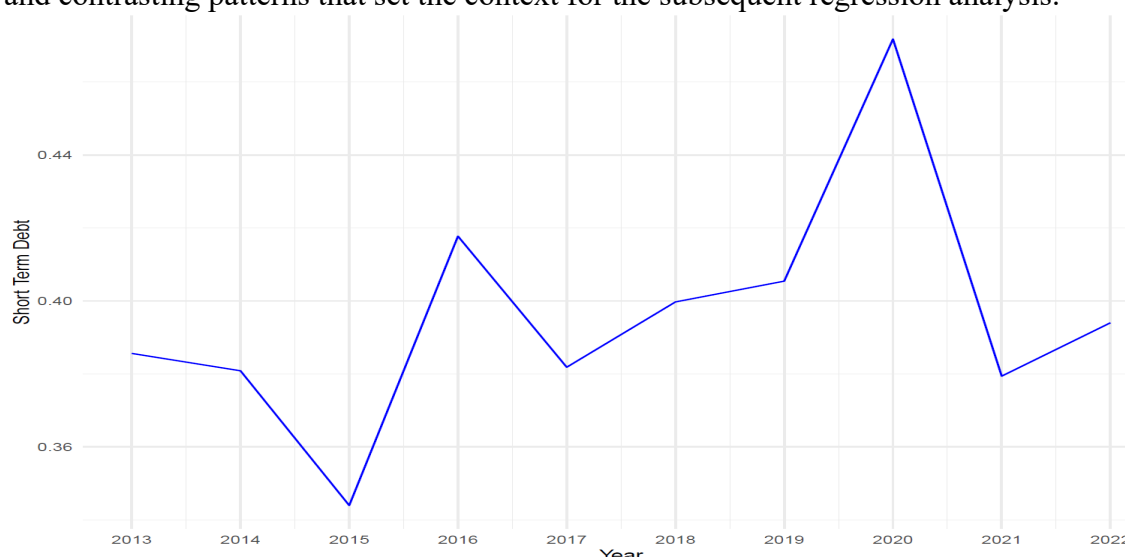


Figure 1. Short Term Debt Trend Line

Figure 1 depicts the trajectory of short-term debt for firms listed on the Nairobi Securities Exchange from 2013 to 2022. The trend is characterized by notable cyclicity. Following a decline to a low in 2015, the ratio experienced a sharp increase in 2016. After a subsequent drop in 2017, a period of moderate growth ensued from 2018 to 2019, culminating in a distinct peak in 2020. This was followed by a significant contraction in 2021 and a slight recovery in 2022. The peak in 2020 likely reflects increased reliance on

short-term financing to navigate the economic uncertainties triggered by the COVID-19 pandemic.

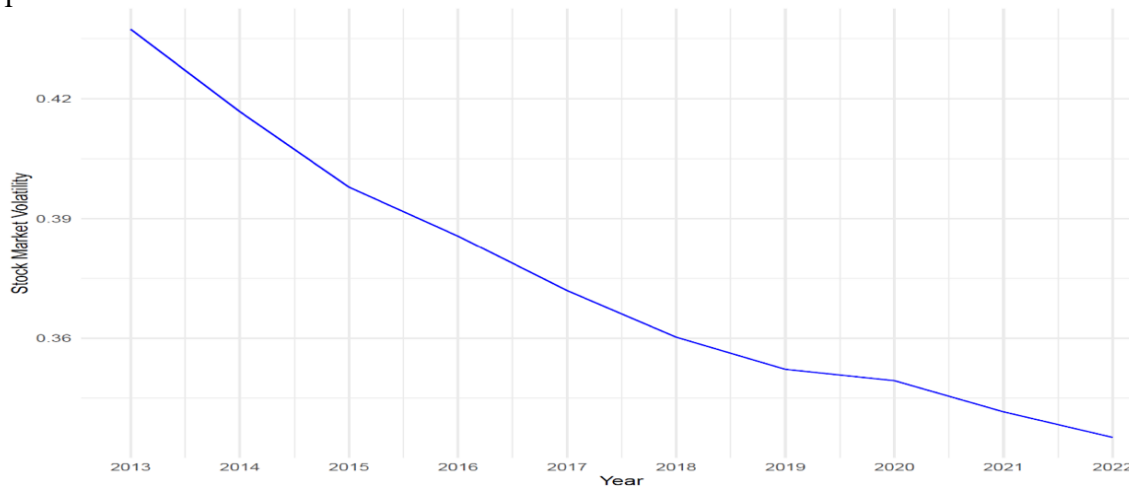


Figure 2. Stock Market Volatility Trend Line

Figure 2 presents the trend of stock market volatility over the same decade. In contrast to the cyclical nature of short-term debt, the market exhibited a clear and steady downward trajectory in volatility. Beginning at a higher level in 2013, volatility consistently decreased each year, ending at a significantly lower level by 2022. This persistent decline suggests a period of increasing market maturity, stability, and potentially decreasing macroeconomic uncertainty within the Kenyan equity market.

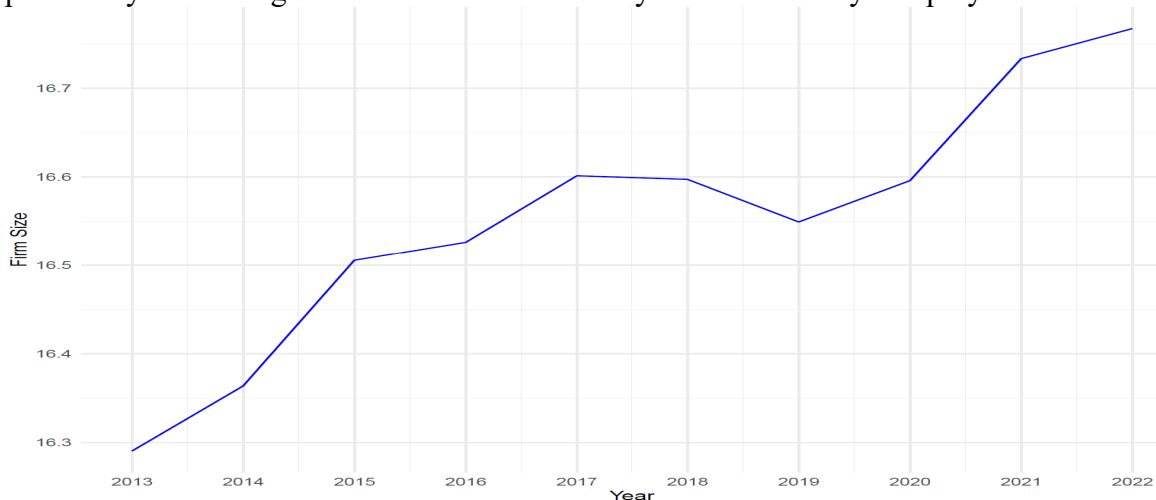


Figure 3. Firm Size Trend Line

Figure 3 illustrates the evolution of the average firm size from 2013 to 2022. The overall pattern indicates a consistent long-term growth trajectory. Despite a period of stagnation and a minor contraction between 2016 and 2019, the trend resumed its upward direction, reaching its highest point at the end of the study period in 2022. This demonstrates that the listed firms, on average, experienced significant expansion over the decade.

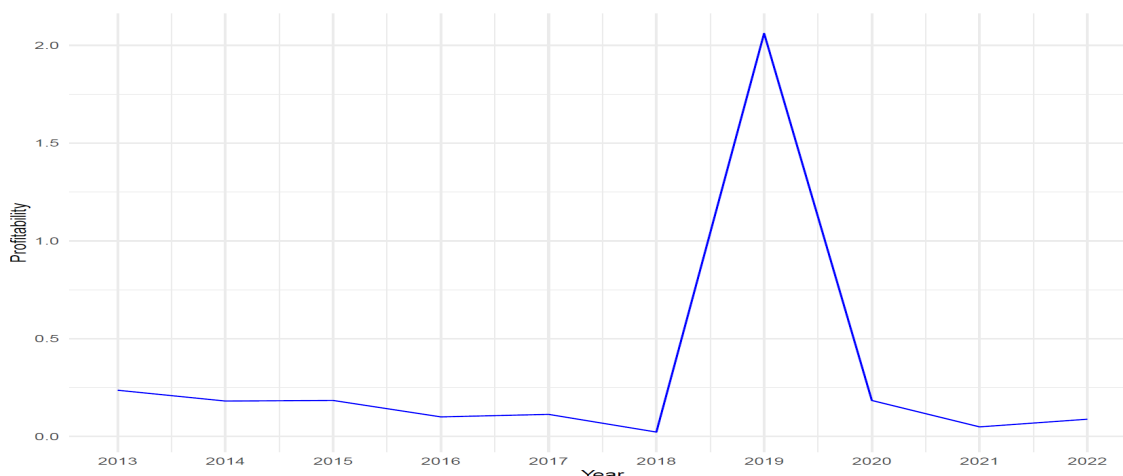


Figure 4: Profitability Trend Line

Figure 4 charts the profitability trend, revealing a predominantly stagnant profile throughout most of the study period, with values hovering near zero. A significant deviation from this pattern occurred during the 2018-2019 period, which featured a sharp, transient surge to a peak. However, this spike was not sustained, and profitability rapidly reverted to its previous low levels by 2020, remaining there with only a marginal improvement by 2022. This indicates a general lack of persistent profitability within the sample, punctuated by a brief, anomalous period of high returns.

4.2 Diagnostic Tests

Prior to regression analysis, a series of diagnostic tests were conducted to ensure the robustness of the model. As summarized in Table 2, the Jarque-Bera test confirmed the normal distribution of variables. The Breusch-Pagan and autocorrelation tests indicated no presence of heteroscedasticity or serial correlation. Furthermore, the Variance Inflation Factor (VIF) for all variables was below 5, confirming the absence of multicollinearity (Table 3). Finally, the Levin-Lin-Chu panel unit root test confirmed that all variables were stationary, validating the use of panel regression models.

Table 2. Summary of Diagnostic Test Results

Test	Purpose	Statistic	p-value	Conclusion
Jarque-Bera	Normality	-	> 0.05	Variables are normally distributed
VIF	Multicollinearity	< 5 for all variables	-	No multicollinearity
Breusch-Pagan	Heteroscedasticity	-	> 0.05	Constant variance (Homoscedasticity)
Autocorrelation Test	Serial Correlation	-	> 0.05	No serial correlation
Levin-Lin-Chu	Stationarity	-	< 0.05	Variables are stationary

Source: Research Data (2023)

4.3 Panel Regression Analysis

To determine the appropriate estimation model, a series of Hausman tests were conducted. The tests conclusively selected the Random Effects Model (REM) over both the Pooled OLS and Fixed Effects models.

Table 3. Impact of Short-Term Debt on Stock Market Volatility (Without Control and Moderator)

Variable	Coefficient	Std. Error	p-value
Constant	0.375771	0.041	0.000
Short Term Debt	0.038	0.009	0.087
R-squared	0.259		
Prob (F-statistic)	0.0000		

Source: Research Data (2023)

The initial regression, without control variables, examined the direct impact of short-term debt on stock market volatility. The results, presented in Table 3, show a positive and statistically significant relationship ($\beta = 0.375771$, $p = 0.000$). The model explains 25.9% of the variation in stock market volatility ($R^2 = 0.259$). This leads to the rejection of the first null hypothesis (H_{01}), confirming that short-term debt has a significant effect on stock market volatility at the NSE.

Table 4. REM on the Impact of Short-Term Debt on Stock Market Volatility (Controlled by Firm Size)

Variable	Coefficient	Std. Error	p-value
Constant	0.3755	0.015	0.000
Short Term Debt (X1)	-0.0170	0.003	0.000
Firm Size (X2)	0.0218	0.005	0.000
R-squared	0.550		
Prob (F-statistic)	0.0000		
Model: $Y_t = 0.3755 - 0.0170X_{1t} + 0.0218X_{2t}$			

Source: Research Data (2023)

The relationship was further investigated by introducing firm size as a control variable. As shown in Table 4, this substantially improved the model's explanatory power, with the R-squared increasing to 0.550. In this controlled model, the relationship between short-term debt and volatility became negative and significant ($\beta = -0.0170$, $p=0.000$).

Table 5. Moderated and Controlled REM

Variable	Coefficient	Std. Error	p-value
Constant	0.380	0.012	0.000
Short Term Debt (X1)	-0.015	0.008	0.061
Firm Size (X2)	0.0215	0.004	0.000
Profitability (Z)	0.185	0.042	0.000
X1 Z	-0.010	0.005	0.042
X2 Z	-0.008	0.003	0.011
R-squared	0.700		
Prob (F-statistic)	0.0000		
Model: $Y_t = 0.380 - 0.015X_{1t} + 0.0215X_{2t} + 0.185Z_t - 0.010X_{1t}Z_t - 0.008X_{2t}Z_t$			

Source: Research Data (2023)

Finally, the moderated model incorporating both the control variable (firm size) and the moderator (profitability) was tested. The results in Table 5 show that the model's explanatory power increased significantly to 70% ($R\text{-squared} = 0.70$). In this

comprehensive model, the direct effect of short-term debt on volatility became negative and statistically insignificant ($\beta = -0.015$, $p > 0.05$). The significant interaction term ($X1tZt$) provides evidence of moderation, leading to the rejection of the second null hypothesis (H_{02}). This confirms that profitability significantly moderates the relationship between short-term debt and stock market volatility.

4.4 Discussion of Findings

The primary finding of this study is the significant relationship between short-term debt and stock market volatility at the NSE. The initial positive relationship aligns with the theoretical proposition that heavy reliance on short-term debt introduces refinancing risk and financial fragility, which can amplify investor perceptions of risk and lead to greater price swings (Baker & Wurgler, 2002). This finding is consistent with recent studies in emerging markets, such as the work by Vuong et al. (2023) in China.

However, the nature of this relationship is nuanced. When controlling for firm size, the relationship turns negative and significant. This suggests that for larger, potentially more stable firms, short-term debt might be perceived as a tool for efficient capital management rather than a risk factor, potentially reducing volatility. This aligns with trade-off theory, where firms balance the benefits and costs of debt.

Most critically, the study establishes a significant moderating role of profitability. The increase in R-squared from 25.9% to 70% upon introducing the control and moderator underscores their critical importance. The negative and significant interaction term ($X1tZt$) indicates that profitability dampens the positive impact of short-term debt on volatility. For highly profitable firms, the market may perceive short-term debt as less risky because these firms have sufficient internal cash flows to service their obligations easily, thus mitigating refinancing fears and stabilizing their stock prices. This finding provides a crucial contingency, explaining why the simple correlation between short-term debt and volatility was weak and non-significant; the effect is highly dependent on the firm's financial performance.

5. Conclusion

This study set out to investigate the relationship between short-term debt and stock market volatility at the Nairobi Securities Exchange (NSE), with a specific focus on the moderating role of profitability and the controlling effect of firm size. The analysis yields several conclusive findings. The study confirms a significant positive relationship between short-term debt and stock market volatility, supported by both correlation and panel regression analysis. This indicates that a higher reliance on short-term debt contributes to increased market fluctuations, likely due to the inherent refinancing risks and heightened perceptions of financial fragility.

Furthermore, the analysis reveals that the capital structure of NSE-listed companies is characterized by a pronounced dependence on short-term debt, which is often perceived as a more accessible and less risky financing option, with its usage following a cyclical pattern. Most critically, the research establishes that profitability acts as a significant moderating variable. The substantial increase in the model's explanatory power upon incorporating this interaction confirms that a firm's financial performance is a crucial contingency factor; for highly profitable firms, the capacity to service short-term obligations appears to mitigate the perceived risks, thereby dampening the effect of debt on volatility.

These findings offer clear practical implications. Corporate managers, particularly in smaller firms, should proactively seek an optimal balance between short-term and long-term financing to mitigate excessive volatility and should exercise strategic caution in their use of short-term debt. Furthermore, sustained efforts to enhance and maintain high profitability are essential, as it serves as a critical financial buffer against debt-induced volatility. Ultimately, firms are advised to adopt a comprehensive and adaptable debt management framework that strategically considers their specific size and profitability to effectively navigate financial risks and promote increased stability in the stock market.

For regulators and policymakers at the NSE, these findings highlight the importance of monitoring aggregate corporate leverage and its maturity profile as a potential macroprudential indicator for market stability. Future research could build upon this work by exploring the role of other firm-specific variables, such as corporate governance structures, or by incorporating macroeconomic factors into the model for a more comprehensive view. A cross-country comparative analysis would also help in assessing the generalizability of these findings across different emerging markets.

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