Interest Rate and Volatility of Share Prices of Firms Listed at the Nairobi Securities Exchange, Kenya

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Abstract

Purpose: The study sought to establish the effect of interest rate on volatility of share prices of companies listed at the NSE. The study was anchored the loanable funds theory.

Methodology: The study employed a descriptive research design. The population of the study was the 20 companies listed at the NSE that forms the NSE share index as of December 2022. The study applied census where all the accessible population of all the 20 NSE share index was used. Data was gathered from secondary sources by the aid of a secondary data collection sheet. Data was obtained from financial and statistical reports released by the CBK. Data was analyzed using descriptive and inferential statistics. The descriptive statistical tools included frequencies, percentages, means, variances and standard deviations. Inferential statistic tools included Pearson's Product Moment correlation and the multiple regression analysis.

Findings: The findings indicated that interest rate (β_3=0.52939, P=003) have significant positive effect on share price volatility. The study recommended that the monetary committee at CBK should maintain stable interest rates in order to encourage borrowing as it would foster investment in the NSE and other sectors.

Unique Contribution to Theory, Practice and Policy: The recommendation is in line with the Loanable Funds Theory, as it seeks to establish a reliable and advantageous climate for borrowing. This approach allows businesses and investors to make more effective investment plans, as they can predict the cost of borrowing over time. Additionally, the monetary committee at the Central Bank of Kenya (CBK), responsible for setting the policy rate, should take into account how their decisions influence short-term interest rates in the economy. This consideration is important for the well-being of businesses, investors and the Nairobi Securities Exchange (NSE).

Keywords: *Volatility of Share Prices, Nairobi Securities Exchange, Interest Rates, Central Bank of Kenya*

INTRODUCTION

Share price is the price at which one share of a company would be purchased. A share's price is not constant; rather, it fluctuates with the state of the market. Companies can raise funds by offering shares to the public thanks to share prices, when share prices are high, people will be encouraged to purchase shares. This encourages businesses to invest in new initiatives, develop their businesses, and hire more employees, all of which can contribute to economic growth (Mwaore, 2017). The ability of shareholders to hold management accountable for their performance is another way that share prices contribute to corporate governance, future prospects for a corporation improve as its stock price rises, an increase in share prices boosts the prices at which investors buy company shares. Companies may be encouraged as a result to run more effectively and perform better financially (Chang & Rajput, 2018). Share prices are used by analysts and investors to assess the health of businesses and industries (Msabaha, 2020).

Interest rates are an important factor that can impact share prices as they affect the cost of borrowing for companies and consumers and the valuation of stocks through the discounted cash flow model. Interest rates are the charges that a borrower or loan customer makes in exchange for using money borrowed, they can be set by central bank or determined by market forces of demand and supply for credit (Mwaore, 2017). As interest rates affect the cost of borrowing for businesses and consumers, they have an impact on share prices. When interest rates are low, borrowing costs drop, making it more affordable for businesses to invest and grow, which raises profits and stock values. Low interest rates can persuade people to spend more money, which can boost the economy and increase the demand for products and services offered by companies (Alam, 2020).

Nairobi Securities Exchange

In Kenya, NSE serves as an important gauge of the health of the country's economy. Kenyan firms rely heavily on the NSE as a source of finance, changes in share prices can have a big influence on both these businesses and the overall economy (Tola, 2018). Interest rates affect the share prices, for instance, a rise in interest rates increases the cost of borrowing for businesses, which has a negative effect on their share prices and profitability (Kibara, 2021). Founded in the early 1920s as a voluntary association of stock brokers under the Societies Act, the Nairobi Securities Exchange, formerly known as the Nairobi Stock Exchange, started operating in 1954. The government and listed firms both trade their financial securities on the NSE. The organization in charge of regulating the Nairobi Securities Exchange's operations is the Capital Market Authority (CMA). CMA provides a trading platform at the Nairobi Stock Exchange for the securities of the listed firms. According to NSE, 20 companies that form NSE 20share index as of December 2022 (CMA, 2022).

Statement of the Problem

The success of the stock markets has a significant impact on the nation's financial stability and economic progress. Publicly listed firms place a lot of emphasis on the value of their stock, which generally indicates the firm's overall financial health. A firm's future prospects are brighter as its stock price rises. However, the NSE20 share prices in Kenya have fluctuated over time (Fredrick, 2021). There was a decline in share prices witnessed in 2018 with the NSE 20 share index recording an 8.91% decrease down to 3,285.73 billion from 3,607.18 billion in 2017 (CMA 2018). The NSE 20 Share Index also recorded a decrease of 18.53% to close the

year at 2,676.92 billion in 2019 (CMA 2019). In 2020 there was a significant decline share prices, the NSE 20 Share Index recorded notable decreases of 26.25% down to 1,942.12billion (CMA 2020). The year 2021, the NSE 20 Share Index recorded a 2.0% decrease down to 1,902.57 billion (CMA 2021). In 2022 the Share Index recorded a 11.90% decrease to close at 1,676.10 billion compared to 1,902.57 billion recorded in 2021 (CMA 2022). The performance of a company's share price is used as a standard of the goods and or services it offers. Sudden drops in stock price might give the impression that the quality of the items or services being offered has declined and they can also negatively impact a company's capacity to compete. Investors base their investment decisions on the trends and changes in macroeconomic indicators since they know that macroeconomic conditions have a big impact on share prices Kemei (2021). Mumo (2017)'s study on the effects of macroeconomic volatility on stock prices in Kenya found out that there was a positive association between exchange rates, interest rates, and share prices. Alam (2020)'s study on effect of macroeconomic variables on the stock market returns of South Asian region established that stock market returns were positively impacted by the GDP growth rate and the return on the stock market has been adversely affected by interest rates and exchange rates. Phiri (2017)'s study on Unemployment stock market relationship in South Africa found linear and nonlinear co-integration as well as causal correlations between unemployment and stock market performance in South Africa. Findings from both linear and nonlinear models demonstrated a sizable co-integration effect between the time series. By examining the effects of interest rate on volatility of share prices of the Nairobi Securities Exchange 20 share index over a five-year period (2018-2022), being current data, the study provides insights that are directly relevant to the Kenyan market context, to close the contextual, methodological and conceptual gap.

Objective of the Study

To establish the effect of interest rate on volatility of share prices of firms listed at the Nairobi securities exchange Kenya

Research Hypothesis

H_O: Interest rate does not have an effect on volatility of share prices of firms listed at the Nairobi securities exchange in Kenya

Justification of the Study

The study findings of these investigations would assist upcoming scholars in identifying new fields of study and formulating fresh research topics. Subsequent researchers may be keen to look into the processes underlying this link between interest rate and volatility of share prices or to examine how other macroeconomic factors interact with interest rates to influence market performance, the study would also serve as a source of empirical literature review for similar studies in future.

The Loanable Funds Theory

The Loanable Funds Theory was formulated by Irving Fisher in 1907. According to the theory, people and businesses save money and lend it to others who want to invest in projects, the cost of using these funds is determined by the interest rate that borrowers pay. Interest rate fall if there is more money available for loans than there is demand and if there is more demand than supply for loanable money, the interest rate will rise. The theory assumes that individuals save their income and invest it to earn a return and assumes that these decisions are based on rational

expectations of future returns and risks. The theory assumes that the interest rate is the price that equates the demand for and supply of loanable funds, individuals and firms are willing to supply loanable funds at higher interest rates and demand loanable funds at lower interest rates and that there is no inflation in the economy, the real interest rate is equal to the nominal interest rate (Romer & Romer, 2018).

The loanable funds theory can be used to understand how changes in interest rates can affect the amount of money available for investing in businesses. When interest rates are high, the cost of borrowing money rises decreasing the demand for loanable funds leading to a decline in investment in businesses, which can have a negative impact on their share prices. In contrast, when interest rates are low, the cost of borrowing money falls, increasing the demand for loanable funds. This can lead to a rise in investment in businesses, which can have a beneficial effect on the share prices of those businesses. The theory can assist in explaining how variations in interest rates impact the availability of loanable funds from savers, savings may increase when interest rates are high because the return on investment is more leading to availability of more money for loans hence lower interest rates (Abel, Bernanke & Croushore, 2017).

Markets for loanable funds are frequently imperfect, with some borrowers or lenders having more bargaining power than others but the theory makes the assumption that the market for loanable funds is perfectly competitive meaning that all borrowers and lenders have perfect information and can easily enter and exit the market. The theory assumes that changes in the money supply have no impact on interest rates, yet changes in the money supply affect investment choices and interest rates. The theory assumes that government intervention in the market is minimal, however, government policies and regulations can significantly affect the supply and demand for loanable funds and interest rates. The loanable funds theory assumes that an economy is closed, meaning that there is no international trade. In reality, international trade can affect the supply and demand for loanable funds and interest rates.

Conceptual Framework

Interest rate
- Mean 91day treasury bill rate

Volatility of share prices
- Standard deviation of share prices
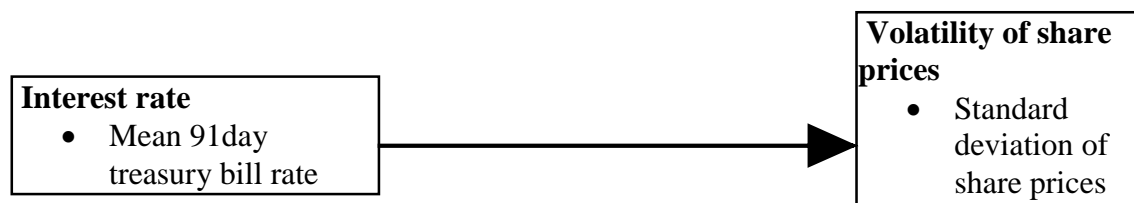
Independent Variable

Dependent Variable

Empirical Review

Muktadir (2013) sought to determine the effects of interest rates volatility on stock returns in Bangladesh. The study used monthly time series data for the period 1991 to 2012, data was analyzed by the Granger causality analysis, findings showed a stable and significant long run relationship. The study considered interest rate volatility as the independent variable and stock returns as the dependent variable, it did not control for other potential factors that could affect stock returns, such as macroeconomic indicators or political events. The study used a regression analysis to analyze the relationship between interest rate volatility and stock returns, which may not fully capture the complexity of the relationship between these variables. The findings

of the study may not be applicable to other emerging markets with different economic and political conditions, interest rate regimes, and levels of financial development.

Hossain, Alam and Khaled (2020) examined the impacts of interest rates on the Dhaka Stock Exchange (DSE) in Bangladesh. The study used a time-series regression model to analyze the impact of interest rates on the DSE over a period of 10 years from 2009 to 2018, monthly data for interest rates and stock returns for the DSE General Index was utilized to examine the relationship between these variables. The study found that interest rates have a significant negative impact on the DSE General Index returns. However, the study did not take into account other factors that may have affected stock returns, such as political instability, changes in government policies, and macroeconomic factors like inflation and exchange rates. The study used a time-series regression model, which may not fully capture the complexity of the relationship between interest rates and stock returns.

Otieno, Ngugi and Wawire (2017) investigated the effect of interest rate on stock market returns in Kenya. The study used an Autoregressive Fractionally Integrated Moving Average model to analyze data, it also examined Granger causality between interest rate and stock market returns, results showed that interest rate and stock market returns are fractionally integrated. However, the study relied on secondary data obtained from the NSE, CBK, and KNBS which may have been subject to errors or inconsistencies. The study used data from only one stock exchange, the Nairobi Securities Exchange (NSE), which has a limited number of listed companies, the small sample size limits the generalizability of the findings to other markets or regions. The study did not consider other variables that may affect stock market returns, such as macroeconomic indicators, political stability, and industry-specific factors. This may lead to omitted variable bias and affect the accuracy of the results.

Mutheu (2016) sought to examine the relation between interest rates and share prices of commercial banks listed at NSE, Kenya. A descriptive research design was adopted for the study; the target population was 10 commercial banks listed at NSE. The study used secondary data of commercial banks listed at NSE, the study used three models; Augmented Dickey Fuller (ADF) model, the Granger Causality Test (GCT) and linear regression model, findings indicated that interest rates had a negative but significant effect on share prices. However, the study examined the relation between interest rates and share prices of commercial banks listed at NSE, thus, the findings are only limited to listed commercial banks in Kenya. The study did not control for other variables that may affect stock prices, such as the performance of the economy, inflation rates, and political stability.

Thuo (2012) analyzed the effects of interest rates volatility on stock returns in the Nairobi Securities Exchange, Kenya. Monthly time series data for the years 2007 to 2011 were used in a descriptive design, the effect and direction of the variables were then determined by using regression and correlation analysis on the data. To examine how interest rate fluctuations, affect the volatility of stock returns, two GARCH (1,1) models were used. Model 2 contains the interest rates for evaluating conditional mean variance while Model 1 is estimated without interest rate changes. The study results indicated that interest rates have strong effect for stock returns and volatility. However, the study only considered the effects of interest rate volatility on stock prices and did not examine other factors that may affect stock prices, such as inflation rates, and exchange rates, therefore, the findings of the study may not fully capture the complexity of the relationship between interest rates volatility and stock prices in the NSE.

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Research Gap

The empirical review of literature makes it clear that there are contextual, methodological, and conceptual research gaps. Contextually, most studies carried out on the impact of interest rate on the share price of listed firms were done in other economies which may limit the generalizability of the findings, Muktadir (2013) sought to determine the effects of interest rates volatility on stock returns in Bangladesh. Methodologically, Otieno, Ngugi and Wawire (2017) investigated the effect of interest rate on stock market returns in Kenya. The study used an Autoregressive Fractionally Integrated Moving Average model to analyze data, this study employed a linear regression model. Conceptually, some studies have emphasized on four variable, findings may not be generalized, effect of macroeconomic variables on share prices of firms listed at the NSE (Mwaore, 2017). This study used the most recent data (2018-2022) and adopted interest rate as the independent variable and volatility of share prices as a dependent variable.

Research Design

This study employed a descriptive research approach. The tactics used to accomplish the research's objectives are referred to as the research design. According to Cooper and Schindler (2003), a study design serves as a roadmap for selecting the data sources.

Population of the Study

A population is everything that is included in any field of study, also referred to as the researcher's universe (Kothari 2004). The 20 companies listed on the Nairobi Securities Exchange that forms the NSE20 share index as of December 2022 made up the study's population.

Sampling Frame

A set of data called a sampling frame is used to choose a sample population for statistical analysis (Olive and Abel, 2003). The sample frame for this study was the list of 20 companies that are used to calculate the NSE 20 share index.

Census

When all factors are considered in such an investigation, it can be assumed that there is no chance element remaining (Kothari, 2004)). The 20 companies listed at the Nairobi Securities Exchange that forms the NSE20 share index as of December 2022 made up the study's population.

Data Collection Instruments

The study gathered quarterly secondary data from secondary sources. Information was gathered from financial and statistical reports released by the NSE, the Central Bank of Kenya, and the KNBS. The performance of stock prices was gauged using the NSE20 share index.

Data Processing and Analysis

Data analysis is the process of applying logic to comprehend the information that has been obtained in order to identify reoccurring patterns and summarize the crucial information gleaned from the research (Olive & Abel, 2003). The filled secondary data collection sheet was adequately checked for credibility and verification after which the data collected will be coded and tested for completeness and then be put in Microsoft excel and the analysis will be done with the aid of the Stata version 17. The study analyzed data using descriptive and inferential

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statistics. The descriptive statistical tools included frequencies, percentages, means, variances and standard deviations. Inferential statistic tools included Pearson's Product Moment correlation and the multiple regression analysis. The study used tables to present the findings.

Model Specification

The following multiple linear regression was utilized to demonstrate the link between independent and dependent variables;

$Y = \beta_0 + \beta_1 X_{1t} + \varepsilon$ ………………………………Equation 3.1

Where;

Y represents the volatility of share price

β_0 represents the constant term

β_1, represents Beta coefficient of independent variable

χ_1 represents the interest rate

t represents time series

ε represents the error term

Descriptive Statistics

According to Hayes and Smith (2021), descriptive statistics describes the features of a specific data set by giving short summaries about the sample and measures of data. According to Darren George and Mallery Paul (2018), mean is a measure of central tendency that gives the average of the particular sample data being used while Standard deviation is used to measure the variability around the mean. Minima and maxima gives the information concerning the spread of the distribution with minima giving the smallest value while the maxima providing the largest. Between 2018 and 2022, Mean 91day treasury bill rate as a measure of interest rate ranged from 6.24 to 9.19 with a mean of 7.3215 and standard deviation of 0.709724. The skewness was less than 2.0 (0.969539) and Kurtosis was less than 6 (3.807969) implying that the data was normally distributed. Volatility of share prices of firms listed at the NSE in Kenya ranged from 1664 to 3780.33 with a mean of 2322.916 and a standard deviation of 633.1609. The skewness was less than 2.0 (0.862013) and Kurtosis was less than 6 (2.603409) implying that the data was normally distributed.

Table 1: Descriptive Statistics

Stats	Mean 91day treasury bill rate	SD of share prices
N	20	20
Min	6.24	1664
Max	9.19	3780.33
Mean	7.3215	2322.916
Sd	0.709724	633.1609
skewness	0.969539	0.862013
kurtosis	3.807969	2.603409

Correlation Analysis

Correlation Analysis is a statistical method used to discover the relationship between variables in a data set. According to James (2022), correlation analysis is used for spotting patterns within datasets. A positive correlation result means that both variables increase in relation to each other, while a negative correlation means that as one variable decreases, the other increases. From the analysis, it is evident that volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya and interest rate had a relationship of (r = 0.5641, P=0.0096) which is positive and significant indicating that increase in interest rate would results to increase in share price volatility.

Table 2: Pearson Correlation Analysis

	Share Price Volatility	GDP	Exchange Rate	Interest Rate
Share Price Volatility	1			
	20			
Interest Rate	0.5642	-0.15	0.7578	1
	0.0096	0.528	0.0001	
	20	20	20	20

Regression Analysis

Regression analysis is a conceptually simple method for investigating relationships among variables (Ali and Chatterjee, 2006). In this study, univariate regression analysis was done to find out the relationship between the independent variable and the dependent variable.

Univariate Linear Regression

A linear regression analysis was conducted between interest rate and volatility of share prices of firms listed at the NSE in Kenya to determine the impact of Interest rate on volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya.

Table 3: Model Summary and ANOVA for Interest Rate

Source	SS	Df	MS	Number of obs	=	20
				F(1, 18)	=	8.4
Model	0.394876	1	0.394876	Prob > F	=	0.0096
Residual	0.845786	18	0.046988	R-squared	=	0.3183
				Adj R-squared	=	0.2804
Total	1.240662	19	0.065298	Root MSE	=	0.21677

The R squared value from the model was 0.318 which implied that the model explained 31.8% of the variation in volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya. The model is statistically significant, $F(1,18) = 8.4$, p=0.009< 0.05 suggesting that interest rate had a significant impact on volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya.

Table 4: Regression Coefficient

SPV	Coef.	Std. Err.	T	P>t	[95% Conf.Interval]	
IR	0.198898	0.068611	2.9	0.01	0.054751	0.343044
_cons	7.434464	0.109233	68.06	0.000	7.204973	7.663954

Share Price Volatility (SPV) = 7.434464+ 0.198898 (IR) ………...Equation 4.3

The regression coefficient of interest rate was 0.198898 at t =2.9, p =0.009 had a significant impact on volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya. This implies that a unit increase if interest rate would cause share price volatility to increase by 0.318 units. These study findings concurred with (Banton's, 2020) findings that interest rates affect companies' cost and accessibility to credit facilities. Also, the findings concur with (Yahyazadehfar, 2012) which established a significant negative association in both the long and short term between the nominal interest rate and Iran's stock market index, (Ozbay, 2009) which established that stock prices were negatively correlated with the interest rate. On the other hand, the study disagrees with (Obudah, 2013) that interest rates unconstructively changed equity investment in Nigeria.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

Interest rate positively correlates with volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya. Simple linear regression revealed that interest rate significantly explained some variation in share price volatility. In the regression model it is evident that interest rate has a positive coefficient. This means that an increase in interest rate has a subsequent positive impact on volatility of share prices of firms listed at the Nairobi Securities Exchange in Kenya.

Conclusion

The study revealed that interest rate has a positive significant effect on volatility of share prices of firms listed at the NSE in Kenya. The null hypothesis that interest rate does not have an effect on volatility of share prices of firms listed at the NSE is rejected. The study concluded that increase in interest resulted in increase in share price volatility.

Recommendations

The study recommended that the monetary Committee department at the CBK is recommended to maintain stable interest rates in order to encourage borrowing as would foster investment in the NSE and other sectors. Further, the Central Bank is advised to be cautious in setting the base rate, it should be go lower rather than higher as this impacts share price volatility. The recommendation is in line with the Loanable Funds Theory, as it seeks to establish a reliable and advantageous climate for borrowing. This approach allows businesses and investors to make more effective investment plans, as they can predict the cost of borrowing over time. Additionally, the monetary committee at the Central Bank of Kenya (CBK), responsible for setting the policy rate, should take into account how their decisions influence short-term interest rates in the economy. This consideration is important for the well-being of businesses, investors and the Nairobi Securities Exchange (NSE).

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