



EFFECT OF MACROECONOMIC VARIABLES ON STOCK MARKET RETURNS PERFORMANCE IN NAIROBI SECURITIES EXCHANGE, KENYA

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Abstract: Stock market is a market that deals with the interest of stocks issued by publicly quoted companies and the government. Therefore, the nature and the state of a Stock market is of great concern to the government, investors and generally all the stake holders. The general objective of the study was to investigate the effect of macroeconomic variables on stock market performance in Nairobi Securities Exchange. The study sought to establish the influence foreign exchange rate, interest rate and inflation rate on stock market performance based on the weighted average monthly data from January 2005 to December 2015 for the companies listed on the Nairobi Securities Exchange in Kenya. The study utilized secondary data that was obtained from: CBK, KNBS and NSE. The study adopted descriptive statistics such as mean and standard deviation in the analysis of data. The secondary data was quantitative in nature (continuous data). The collected quantitative data was edited and coded and entered into a Stata version 14 for analysis. Both descriptive and inferential statistics was used to analyze the quantitative data. In descriptive statistics, the study used frequency distributions, mean, standard deviation and percentages. A multiple regression analysis was used to establish the relationship between the independent variables and the dependent variable. The study found that foreign exchange rate has a negative effect on stock market performance in Nairobi Securities Exchange. Over the years, the shilling has been unstable against the hard currencies of the world implying that even the foreign debts denominated in forex end up becoming a great burden on Kenyan economy. The study also found that interest rate has no significant effect on stock market performance in Nairobi Securities Exchange. In addition, the study found that inflation has a significant and negative effect on stock market performance in Nairobi Securities Exchange. The study recommends that the policy makers and the central bank of Kenya (CBK) should plan in advance and influence the macro-economic variables such as inflation by developing policies to minimize inflation. Inflation should be cubed as it negatively stock market performance. Although the government of Kenya managed to curb interest rates in commercial banks in Kenya, the same is no extended to further financial institutions such as microfinance institutions.

Key Words: Macroeconomic, Stock Market, Performance

Introduction

In most economies, effective equity market remains a critical segment of financial markets due to its role in mobilizing long term investible funds for productive investment. More so, empirical evidence suggests that movements in equity prices are fundamental in explaining aggregate investment behavior (Barro, 2002). The effectiveness and efficiency of equity market could be measured by the performance of equity market returns. Stock market plays a vital role in the modern economy because it acts as a mediator between lenders and borrowers. A well-functioning Stock market promotes economic development through boosting savings and allowing for a more efficient resource allocation and distribution. An efficient Stock market enhances the Savings to increase since the Stock market

provides households with assets that satisfies their risk preferences and liquidity needs (Adjasi, 2008). Efficient Stock interest diversifies the domestic funds and activates the productive investment projects by enhancing liquidity and providing funds for industrialization and economic development. However, this is only possible if the Stock market has significant relationship with the macroeconomic variables. According to Gatuhi (2015), any investor who wishes to be successful by increasing the returns must ensure that focus on the consideration of price shaping macroeconomic variables. The relationship between Stock market and macroeconomic variables has become primary focus in the research between academics and practitioners. Stock prices are the discounted present values of expected future cash flows. According to economic theory, Stock market should be closely related with the macroeconomic variables in an economy.

Studies conducted in both developed and developing countries used different macroeconomic variables and show mixed findings on the macroeconomic variables on stock market performance. However, the macroeconomic variables having the most contested findings include inflation, interest rate and foreign exchange rate. In the United Kingdom and Germany, Masuduzzaman (2012) found that inflation, interest rate and foreign exchange rate had a negative influence on stock market performance. However, money supply had a positive influence on stock market performance. In Ghana, Barnor (2014) found that the findings revealed that interest rates and money supply had a significant negative effect on stock market returns; however, exchange rates had a significant positive effect on stock market returns. Moreover, inflation rate did not significantly affect stock market returns in Ghana. In Kenya, Barasa (2014) found that macro-economic factors such as money supply, GDP, inflation and Interest rates had no significant influence on stock market performance. These findings also contrary to Gatuhi (2015) findings that exchange rate, inflation and interest rate had a positive influence on the stock market performance in Nairobi Security Exchange.

In Kenya, dealing in shares and Stock started in 1920. However, trading of shares was done informally since rules and regulations to govern Stock broking activities never existed (Ngugi 2003). In 1954, NSE was constituted as a voluntary association of Stock brokers registered under the societies act. In 1988, the first privatization at the NSE was successfully done with a sale of 20% government stake in Kenya commercial bank (Ngugi 2003). In September 2006 live trading on the automated trading systems (ATS) of the Nairobi Securities Exchange was implemented. In July 2011, Nairobi Stock Exchange changed its name to Nairobi Securities Exchange to revolve into a full service securities Exchange. The NSE 20 share index has been fluctuating over time and hence affecting the performance of share returns. Changes in the various macroeconomic variables like interest rate, inflation and exchange rate have been affecting the economic conditions hence influencing the performance of the Stock. Within a period of within a period of thirty four months, the NSE share index recorded its lowest point of 3224 in January 2012 while 5256 points was recorded in the month of September 2014 (NSE, 2016). It is hence evident from NSE 20 share index keeps on fluctuating from time to time.

Statement of the Problem

The Nairobi Securities Exchange Market plays a very key role in creating potential investment opportunities for domestic and foreign investors and a leading economic growth indicator. Quoted companies and households at the Nairobi Securities Exchange suffer from increasing stock return performance. Stock prices influences investment decisions and therefore excessive Stock returns performance undermines the usefulness of Stock prices since Stock prices shows the true intrinsic value of a firm (Karolyi, 2001). In order to inform quality policy making process, it is vital to understand factors that significantly influence the stock market performance. Majority of the studies

that have been done to evaluate stock returns, performance, and the macroeconomic variables mainly emanate from developed markets. Robert (2008) investigated the effect of macroeconomic variables on stock market return for four economies; Brazil, China, Russia and India where he found that a relationship between interest and the Stock market returns exist. However, having been conducted in other countries with different business environments, number of companies listed in the stock market and legal framework governing the stock market, the findings of this study cannot be generalized to NSE.

Studies on emerging market especially in Kenya have concentrated on the stock markets development on economic growth. In addition, study conducted in Kenya on macroeconomic variables and stock market performance show mixed findings. For instance, Barasa (2014) found that GDP, inflation and Interest rates had no significant influence on stock market performance. Kitatia, Zablonb and Maithya (2015) found that interest rate, exchange rate had a negative effect on stock market performance. Also, Gatuhi (2015) found that exchange rate, inflation and interest rate had a positive influence on the stock market performance. It is evident that there is no consensus in literature of the main factors causing volatility where factors vary from one study to another. It is therefore not clear how inflation, foreign exchange rate and interest rate influence stock market performance.

Evaluating the relationship between macroeconomic variables and stocks return is important for an economy. Policy makers would wish to establish which factors influence stock market performance in order to create an enabling environment for thriving investments. There is therefore a need for an evaluation of the relationship between stock returns and the macroeconomic variables and the effects of changes in such variables on performance of the stock returns in the NSE.

The study sought to test the following null hypothesis;

H₀₁: Exchange rate has no significant effect on stock market performance in Nairobi Securities Exchange.

H₀₂: Interest rate has no significant effect on stock market performance in Nairobi Securities Exchange.

H₀₃: Inflation has no significant effect on stock market performance in Nairobi Securities Exchange.

Literature Review

Concept of Stock Market Performance

Stock market performance is the assessment of an efficient market. A basic feature of an efficient capital market is constant liquidity, an easy mechanism for entry and exit by investors. This requires sufficient volume and size of transactions in the market (Daasi et al., 2015). The stock market forms a significant component of the financial sector of any economy. A well-functioning stock market is expected to lead to a lower cost of equity capital for firms and allow individuals to more effectively price and hedge risk. Stock markets can attract foreign portfolio capital and increase domestic resource mobilization, expanding the resources available for investment in developing countries (Masuduzzaman, 2012). Researches have been carried out in the past to establish the relation between the various microeconomic variables and stock market returns performance. The NSE 20-share index recorded the highest performance so far on 12th December 2007 with 6161.46 points. The worst performance in the last ten years was recorded on 3rd January 2005 with 2955.99 points. The period January 2008 to December 2012, witnessed minimal fluctuations in stock market in Kenya. During the

same period, both the US Dollar and Euro gradually kept appreciating against the Kenya shilling (Kitati, 2015). According to Omondi and Olweny (2011), NSE has been the hub of stock market, to be precise, financial markets in East and Central Africa. The bourse is one of the best performing exchanges in Africa, researchers have in the past concentrated in other exchanges and very few literatures has been done on factors affecting stock return performance. This study is important because its objective was to establish to what extent the stock market returns performance can be explained by various macroeconomic variables.

Theoretical Review

A theory is a set of statements or principles devised to explain a group of facts or phenomena. The study was anchored on three theories, namely; Fisher Theory, Classical Economic Theory and Efficient market hypothesis.

Fisher Theory

Fisher (1930) hypothesized that the ex-ante nominal interest rate should fully anticipate movements in expected inflation, in order to yield the equilibrium real interest rate. The expected real interest rate is determined by real factors such as the productivity of capital and time preference of consumers, and is independent of the expected inflation rate. In principle, the Fisher hypothesis could be extended to any asset, such as real estate, common stock, and other risky securities. The early studies on the Fisher hypothesis mentioned above were mainly concerned with documenting and describing the nature of the relationship between stock returns and inflation, and not with any explanation of the results (Mlambo, Maredza & Sibanda, 2013). Several alternative explanations have emerged. The Tax-Effect Hypothesis proposed by Feldstein (1980) argues that inflation generates artificial capital gains due to the valuation of depreciation and inventories (usually nominally fixed) subject to taxation. This increase corporate tax liabilities and thus reduces real after-tax earnings. Rational investors would take into account this effect of inflation by reducing common stock valuation. In this sense, inflation “causes” movement in stock prices.

Classical Economic Theory

Classical theory reoriented economics away from individual interests to national interests. Classical economics focuses on the growth in the wealth of nations and promotes policies that create national expansion (Thang, 2009). During this time period, theorists developed the theory of value or price which allowed for further analysis of markets and wealth. It analyzed and explained the price of goods and services in addition to the exchange value. The Classical economic theory suggests a relationship between the stock market performance and the exchange rate behavior. This theory hypothesizes that stock prices and exchange rates can interact by way of the ‘flow oriented’ and ‘portfolio balance’ models. Movements in the stock market may also affect exchange rates (Alam, 2009). Equities, being part of wealth, may affect the behavior of exchange rates through the demand for money according to the monetarist models of exchange rate determination (Qamri, Ul-Haq & Akram, 2015). Similar links can be traced through the portfolio balance models as well. In contrast, according to portfolio balance (asset) models to exchange rate determination, it is argued that a change in stock prices could also have an impact on currency value. Therefore, stock price innovations may affect or be affected by the exchange rate dynamics (Khumalo, 2013). Moreover, exchange rates may have a positive or negative impact on stock performance depending upon the nature of the economy

Efficient market hypothesis

This model was developed by Fama (1970). The model states that in an efficient market, all the important information concerning the changes in macroeconomic variables is fully reflected in the current stocks prices. Also, stocks prices fully and rationally incorporate all the relevant information and therefore this theory supports the idea that the changes in any macroeconomic variables should not affect stocks much, thereby discrediting its applicability in stocks returns. The informational efficiency of stock prices matters in two ways. First, investors care about whether various trading strategies can earn excess return that is to say beat the market (Mbulawa, 2015). Consequently, if stock prices accurately reflect all information, new investment in the market goes to its highest-valued use as a result the stock market development goes up. There are three different forms of market efficiency such as weak form, semi-strong form and strong form. Each form of efficient market theory has ability to rule out the possibilities of consistent outperformance by a certain group of investors who use certain type of information as the tool in their trading activities. However, under assumption of efficient Capital markets, all investors are risk averse and completely rational in making their decisions (Hodnettc & Hsieh, 2012).

Empirical Review

This section presents a review of empirical literature on the effect of exchange rate on stock market performance; effect of interest rate on stock market performance; and effect of inflation rate on stock market performance.

Exchange Rate

Exchange rates affect the competitive position of companies, cash flow and profitability. An increase in exchange rate (depreciation) causes a decrease in stock returns. Companies which rely heavily on imports suffer from higher costs due to a weaker domestic currency hence lower earnings. On the other hand, domestic products will become cheaper to foreign traders hence a benefit to the domestic exporters (Murungi, 2012). Mlambo, Maredza and Sibanda (2013) conducted a study on the effects of exchange rate volatility on the stock market in South Africa. The Generalized Autoregressive Conditional Heteroskedascity (1.1) (GARCH) model was used in establishing the relationship between exchange rate volatility and stock market performance. The study employed monthly South African data for the period 2000 – 2010. The data frequency selected ensured an adequate number of observations. A very weak relationship between currency volatility and the stock market was confirmed. The weak relationship between currency volatility and the stock market suggests that the JSE can be marketed as a safe market for foreign investors. However, investors, bankers and portfolio managers still need to be vigilant in regard to the spillovers from the foreign exchange rate into the stock market. In Kenya, Kirui (2014) sought to evaluate the relationship between exchange rate and stock market return. T –garch model was used to capture leverage effects and volatility persistence at the NSE where time series quarterly data from 2000 to 2012 was used. The study found that exchange rate had an effect on stock returns which was a negative relationship.

Interest Rate

Interest rates affect the competitive position of companies, cash flow and profitability. An increase in interest rate causes a decrease in stock returns. Companies which rely heavily on imports suffer from higher costs due to a weaker domestic currency hence lower earnings. On the other hand, domestic products will become cheaper to foreign traders hence a benefit to the domestic exporters (Thang, 2009). There exists a lot of empirical literature regarding the impact of Interest Rate on stock market

return performance with a view of determining the causality. In Malaysia, Thang (2009) conducted a study on the impact of Interest Rate and Exchange Rate on the Stock Market Index. Prior to testing for co-integration, Augmented Dickey Fuller (ADF) unit root test is performed. All the variables in our study are stationary at first difference, that is $I(1)$ variables. Johansen Juselius (JJ) co-integration test, Vector Error Correction Model (VECM) and Granger Causality test were applied to search for the long run and short-run impacts respectively. The results indicated that interest rate had a negative impact on the stock market index in the long run as well as the short run. Gatebi (2013) investigated the effect of macroeconomic factors on the performance of common stock returns in NSE. Monthly time series data for a five year period between January 2007 and December 2011 was used. The study undertook explanatory survey research where E-Garch was used in the analysis. The results indicated that Interest Rate had a negative correlation against the common stock return performance.

Inflation Rate

Inflation rate is a key macroeconomic variable in the Kenyan economy. Unexpected inflation triggers a rise in the living cost which will tend to shift the resources from the investment to consumption expenditure (Umashankar & .Himabindu, 2015). As inflation goes up, discount rate used to determine intrinsic values of stocks will therefore increase which will reduce the present value of net income leading to lower stock prices (Talla 2013). Mbulawa (2015) carried out a study on the impact of inflation on stock market performance in Zimbabwe between 1980 and 2008. The study employed VECM approach to test the dynamic relationship in the short and long term and to understand the key drivers of each variable. Findings support the Fisher hypothesis but stocks did not offer perfect protection from the effects of inflation over the long period. Inflation was responsible for less than 10% of variations in stock market performance during the first three quarters of the first year and this would gradually increase up to a high of 37% towards the end of the 24 months period. In Kenya, Murungi (2012) carried out a study on the impact of inflation on stock market returns and volatility in Nairobi Securities Exchange. The OLS estimation technique was employed to estimate a single equation relationship with the stock return as the dependent variable and explanatory variable as inflation. The coefficient for inflation from regression results is high at -0.38 implying that inflation is good at explaining the stock returns. The relationship between stock returns and inflation was found to be negative. This finding opposed the Fisher Hypothesis which states that the two variables are positively correlated in the sense that an increase in inflation leads to a proportional change in nominal market returns consequently hedging against inflation.

Conceptual Framework

The conceptual framework for the present study shows the hypothesized association between macroeconomic variables and stock market performance in Nairobi Securities Exchange. The independent variables were foreign exchange, interest rate fluctuation and inflation rate. The dependent variable was stock market performance in Nairobi Securities Exchange.

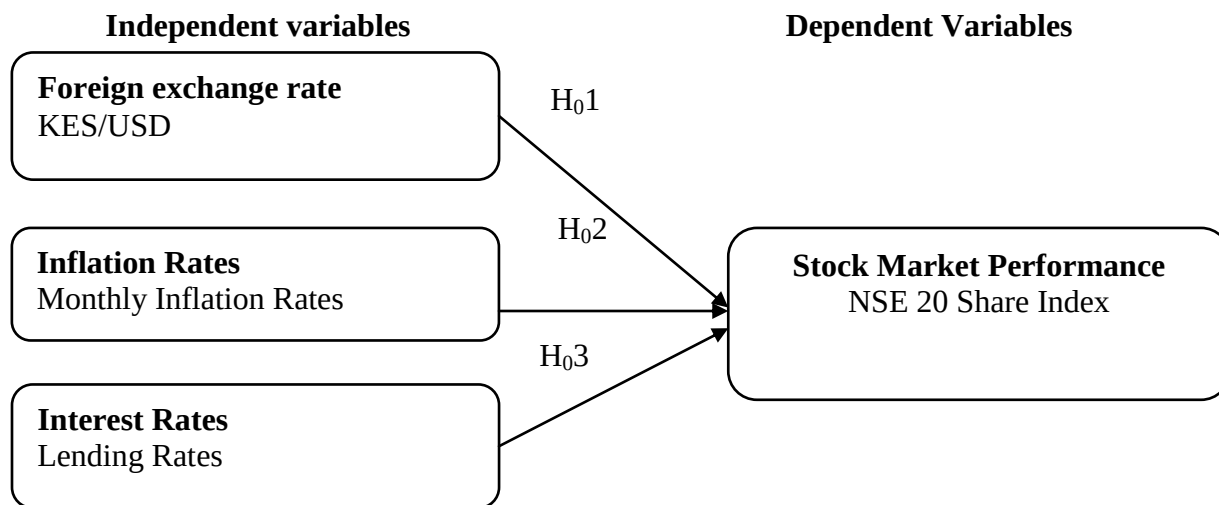


Figure 1: Conceptual framework

Research Methodology

Longitudinal Time series research under causal relationship research design was adopted in the study. The target population consisted of all the 65 companies listed at Nairobi Security Exchange (NSE) as at December 2015 from which NSE share index is derived from (NSE, 2015). This was an appropriate population and gave a clear picture of the situation in the market with all participants included.

The study used monthly time series data for NSE 20 share index that covered a period of 11 years from January 2005 to December 2015. This was aimed at achieving comprehensive coverage and a decade gave much accurate results. A data collection sheet was used to capture the monthly data of Exchange rate, Interest rate, and Inflation. The type of data used was secondary data. The NSE 20 share index return was sourced from the NSE database. Inflation rate data was sourced from Kenya National Bureau of Statistic (KNBS) database while the data on interest rate and Foreign Exchange was sourced from the central bank of Kenya (CBK) database. This was through the published time series data and monthly abstracts. The data spanned from January 2005 to December 2015.

The collected data was used for analysis purposes so that the right interpretation was done. The data was converted to their natural logs to deal with the problem of large numbers and eliminate heteroscedasticity. A variety Econometrics models were used in the study to analyze the collected data so as to get accurate results. Quantitative methods were include statistical methods like measurers of central tendency (mean, mode and median), measures of dispersion (Standard deviation, and variance) and regression analysis (OLS) to determine the correlation between variables and a post analysis of the obtained correlation coefficients in order to give a founded conclusive analysis on the research subject.

The diagnostic tests were performed on the model include correlation analysis, normality test, Heteroscedasticity Test, Autocorrelation, Stationarity and Unit Root Test and Co-integration test.

Arbitrage Pricing Theory captures the explicit relationship between stock returns and the macroeconomic variables and it has a high forecasting power than the efficient market hypothesis, capital asset pricing model and the intertemporal capital pricing model. Following the theoretical framework, Foreign Exchange Rate (FX), Interest rate (IR) and Inflation (In) and were incorporated into a linear model as suggested by Chen, Roll and Ross (1986) as follows

$$R=f(f_1, f_2, f_3, \dots, f_k)$$

Substituting f_1, f_2, f_3 , with the macroeconomic variables, equation 3.4 was expressed as follows.

$$R=F(FX, IR, In)$$

Where R the market stock return, FX is the Foreign Exchange Rate, IR is Interest Rate and In represented Inflation Rate.

In order to perform partial elasticity analysis, logs of the variables in the equation below were taken so as to assess the impact of a change in the independent variables on the dependent variable.

Expressing equation 3.4 in the form of log linear model, the following was the result.

$$R_t = \beta_1 \ln FX_t + \beta_2 \ln IR_t + \beta_3 \ln I_t \dots \dots \dots 3.5$$

Research Findings and Discussions

The objective of this study was to investigate the effect of macroeconomic variables on stock market performance in Nairobi Securities Exchange. The results were presented in tables and figures. The study covered a period of 11 years starting from January 2005 to December 2015. The total number of observations was 132.

Descriptive Statistics

The descriptive statistics comprise of mean, standard deviation, minimum and maximum of the dependent variable (NSE 20 Share Index) and the independent variables (Foreign exchange rate, Interest rate, Inflation).

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NSE 20 Share Index	132	2556.97	5987.37	4294.5530	768.01610
Foreign exchange rate	132	62.03	105.29	80.6673	9.70064
Interest rate	132	12.12	20.34	15.2464	2.06576
Inflation	132	3.09	31.50	11.3467	7.19865

From the findings, the average NSE 20 Share Index was 4293.5540 for the period ranging from January 2005 to December 2015. The minimum NSE 20 Share Index was 2556.97 and the maximum was 5987.37. In addition, the average foreign exchange rate over the study period was 80.6673. The minimum foreign exchange rate was 62.03 and the maximum was 105.29. Further, the average interest rate over the study period was 15.2464%. The minimum interest rate over the study period was 12.12% and the maximum was 20.34%. Also, the average inflation over the study period was 11.3467%. The minimum inflation rate was 3.09% and the highest was 31.50%.

Trend Analysis

This section presents the trend analysis for the dependent variable (NSE 20 Share Index) and the independent variables (Foreign exchange rate, Interest rate, Inflation). Figure 2 shows the trend of NSE 20 Share Index in Kenya for the period ranging from January 2005 to December 2015.

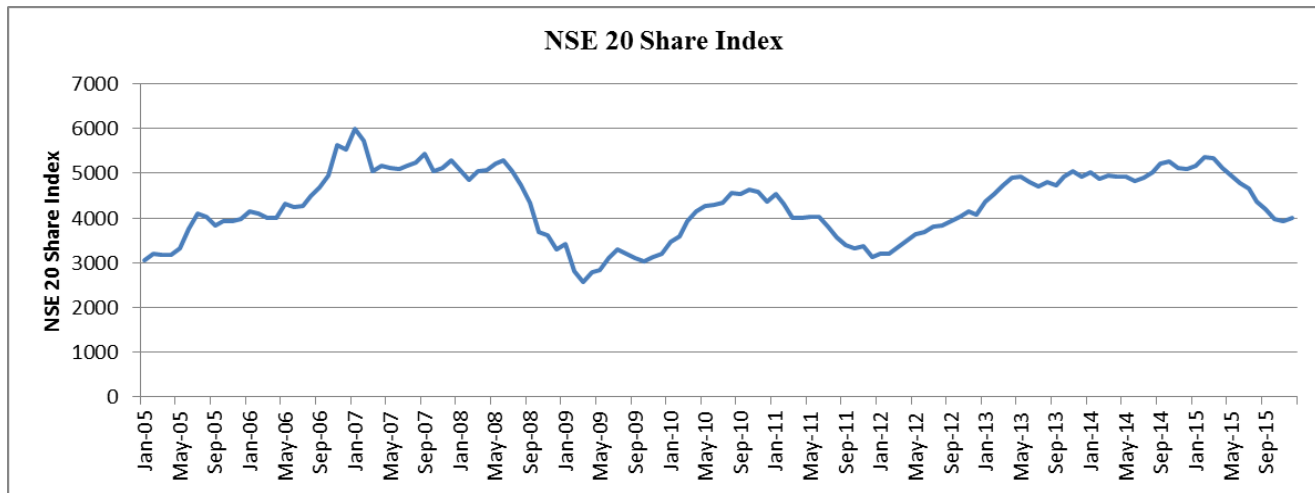


Figure 2: NSE 20 Share Index

At the beginning of the study period (January 2005), NSE 20 Share Index was at 3057.63 while at the end of the study period (December 2015) NSE 20 Share Index was at 3988.23. The lowest NSE 20 Share Index was 2556.97 in March 2009 while the highest was 5987.37. The results show that NSE 20 Share Index has been fluctuating over the years. However, in the year 2015 NSE 20 Share Index had been on a decreasing trend.

Figure 3 shows the trend of foreign exchange rate in Kenya for the period ranging from January 2005 to December 2015.

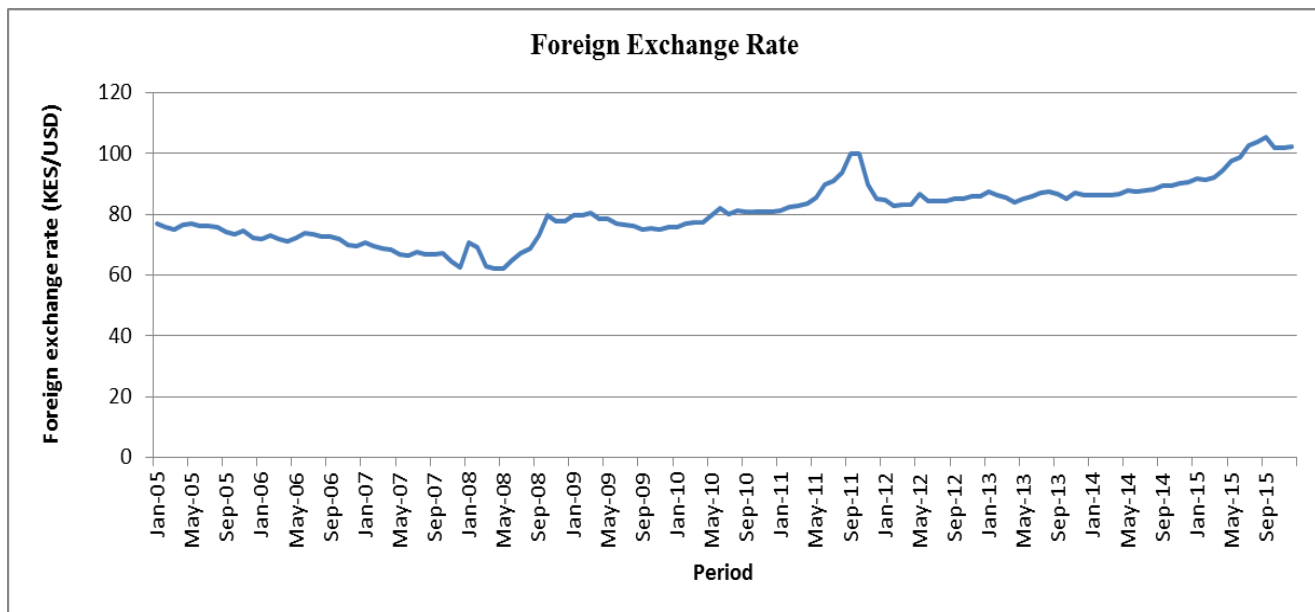


Figure 3: Monthly Foreign Exchange Rate

At the beginning of the study period (January 2005) foreign exchange rate was at 76.801 and at the end of the study period (December 2015) foreign exchange rate was at 102.311. The lowest foreign exchange rate over the study period was in May 2008 at 62.029 while the highest was in the year September 2015 at 105.293. The findings show that although foreign exchange rate has been fluctuating over the study period, it has generally been on an increasing trend.

Figure 4 shows the trend of the lending rates in Kenya for a period of 11 years starting from January 2005 to December 2015.

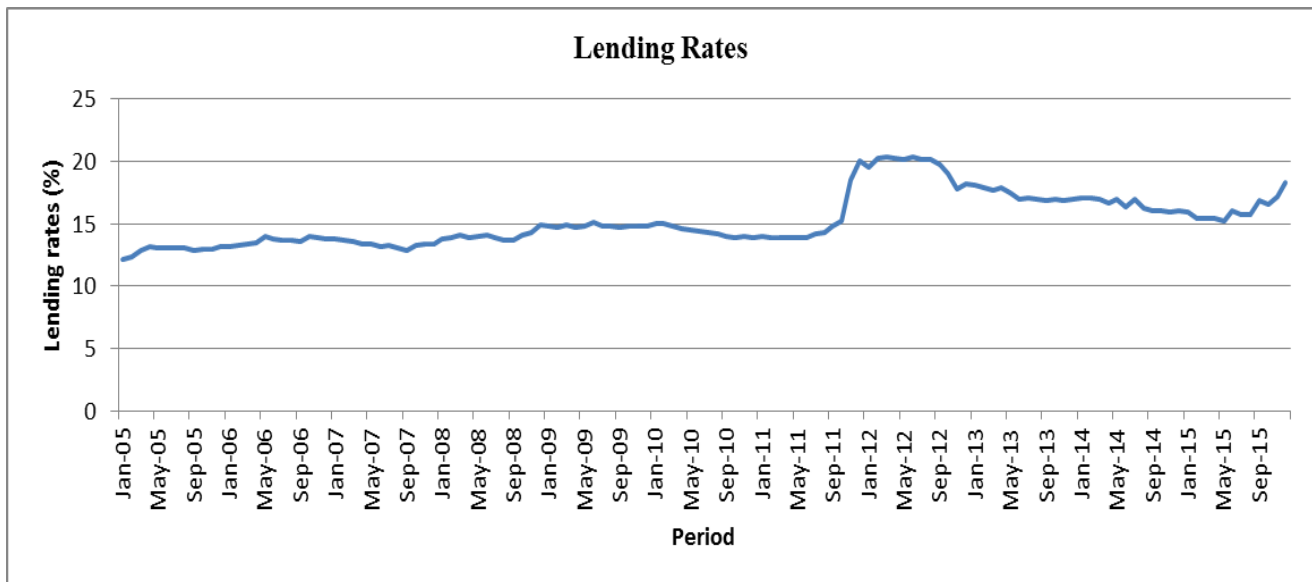


Figure 4: Monthly Lending Rates

At the beginning of the study period (January 2005), lending rates was at 12.12% while at the end of the study period it was at 18.3%. This lowest lending rate was 12.12%, which was in January 2005. The highest interest rate was 20.34% in March 2012. The findings show that although there were some fluctuations in lending rates in Kenya, the lending rates generally increased over the study period.

Figure 5 shows the trend of inflation in Kenya for the period of 11 years ranging from January 2005 to December 2015.

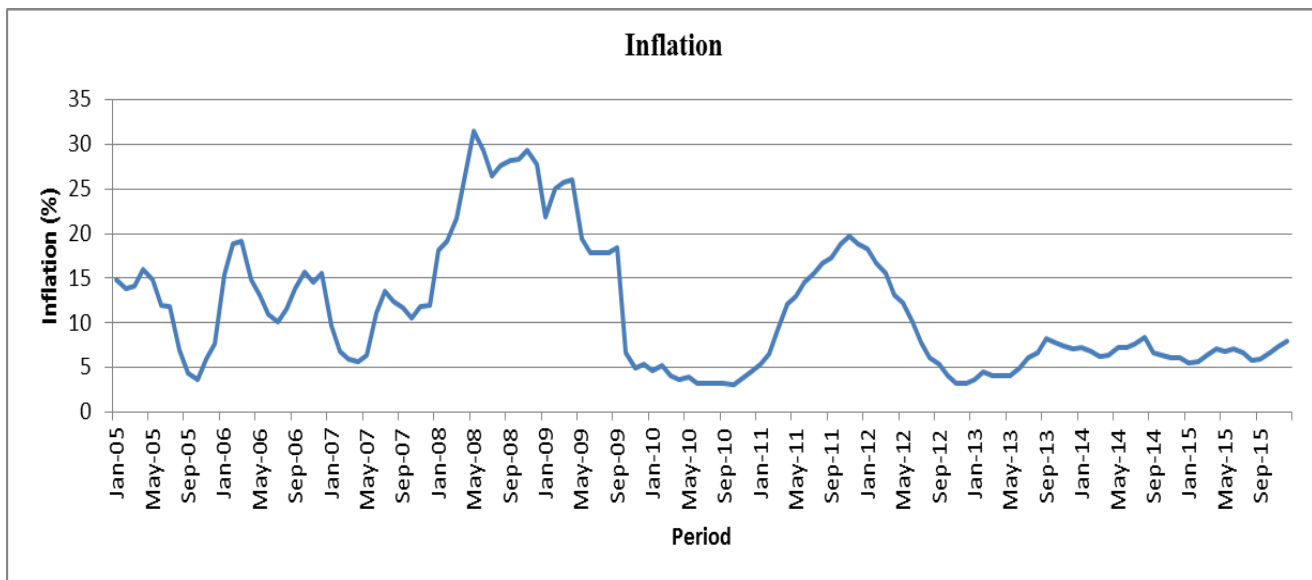


Figure 5: Monthly Inflation Rate

At the beginning of the study period (January 2005), inflation rate was at 14.9% while at the end of the study period (December 2015) it was at 8.01%. The lowest inflation rate over the study period was 3.09 in October 2010. The highest inflation rate was 31.5% in May 2008.

Test for unit root levels

In order to check for stationarity of the data, the study employed Augmented Dickey Fuller unit root test (ADF); this was chosen because it is not affected by autocorrelation as opposed to other tests. If the data is found to contain unit root and require first difference in order to be stationary, then the variable in question will be deemed to have a long run relationship with the dependent variable and would therefore require a co-integration test to be conducted. If the exogenous data is run through ADF test and happens to be stationary at level, the data would be assumed to be affecting the model in the short run. The null hypothesis is that the variables are not stationary or they got unit root.

Table 6: Test for unit root levels

Variable	Number of obs	Test Statistic	Interpolated Dickey-Fuller			Z(t) p-value
			1% critical value	5% critical value	10% Critical value	
Foreign Exchange rate	131	-0.383	-3.500	-2.888	-2.578	0.9128
Interest Rate	131	-1.340	-3.500	-2.888	-2.578	0.6107
Inflation	131	-1.900	-3.500	-2.888	-2.578	0.3319
NSE 20 Share Index	131	-1.938	-3.500	-2.888	-2.578	0.3143

In relation to foreign exchange rate the null hypothesis was that ‘foreign exchange rate has got unit root or it is not stationary’. Since the p-value (0.9128) was more than the significance level (0.05), we can accept the null hypothesis. This implies that foreign exchange rate has got unit root. With regard to interest rate, the null hypothesis is that ‘interest rate has got unit root or it is not stationary’. The p-value was 0.6107, which more less than the significance level (0.05) and hence we can accept the null hypothesis. This shows that interest rate has got unit root. Regarding inflation, the null hypothesis is that ‘inflation has got unit root or it is not stationary’. Since the p-value (0.3319) was more than the significance level (0.05), we can accept the null hypothesis. This implies that inflation rate has got unit root. In relation to NSE 20 Share Index the null hypothesis was that ‘NSE 20 Share Index has got unit root or it is not stationary’. Since the p-value (0.3143) was more than the significance level (0.05), we can accept the null hypothesis. This implies that NSE 20 Share Index has got unit root.

Estimation of granger causality

Since all the variables were found to have a unit root, the Engel Granger test was used to test for co-integration.

Table 2: Granger Causality Wald Tests

Equation	Excluded	chi2	df	Prob > chi2
R	FX	12.756	2	0.002
R	IR	3.2135	2	0.201
R	In	12.848	2	0.002
R	ALL	21.844	6	0.001
FX	R	1.213	2	0.545
FX	IR	3.2678	2	0.195
FX	In	.49874	2	0.779
FX	ALL	4.8876	6	0.558
IR	R	.93792	2	0.626
IR	FX	28.022	2	0.000
IR	In	12.124	2	0.002
IR	ALL	38.256	6	0.000
In	R	1.452	2	0.484
In	FX	.2519	2	0.882
In	IR	2.7663	2	0.251
In	ALL	6.7303	6	0.347

In the first equation, the null hypothesis indicates that foreign exchange rate does not Granger-cause stock market performance. Since the p-value (0.002) is less than the significance level (0.05) we reject the null hypothesis. This implies that foreign exchange rate Granger-causes stock market performance. In addition, stock market performance does not granger cause foreign exchange rate. This is because the p-value (0.545) is greater than the significance level (0.05). In the second equation, the null hypothesis indicates that interest rate does not Granger-cause stock market performance. Since the p-value (0.201) is more than the significance level (0.05) we accept the null hypothesis. This shows that interest rate does not Granger-cause stock market performance. In addition, stock market performance does not granger cause interest rate. This is because the p-value (0.626) is greater than the significance level (0.05).

In the third equation, the null hypothesis indicates that inflation does not Granger-cause stock market performance. Since the p-value (0.002) is less than the significance level (0.05) we reject the null hypothesis. This implies that inflation Granger-causes stock market performance. In addition, stock market performance does not granger cause inflation. This is because the p-value (0.484) is greater than the significance level (0.05). In addition, all the three variables combined granger cause stock market performance. This is shown by a p-value of 0.001, which is less than the significance level.

Regression Model

In a multiple regression analysis, logs of the independent variables were taken so as to assess the impact of a change in the independent variables on the dependent variable. The model was as follows;

$$R_t = \beta_1 \ln FX_t + \beta_2 \ln IR_t + \beta_3 \ln I_t$$

Where R the market stock return, FX is the Foreign Exchange Rate (FX), IR is Interest Rate and In represented Inflation Rate.

Table 3: Model Summary and Analysis of Variance

Source	SS	df	MS	Number of obs =	132
Model	11208710	3	3736236.66	F(3, 128) =	7.24
Residual	66061474.5	128	516105.27	Prob > F =	0.0002
				R-squared =	0.1451
				Adj R-squared =	0.1250
Total	77270184.5	131	589848.737	Root MSE =	718.4

The R-squared shows the variance in the dependent variable that can be explained by the independent variables. The R-squared in this study was 0.1451, which shows that the three variables (foreign exchange rate, interest rate and inflation) explain 14.51% of the dependent variable. This implies that 85.49% of stock market performance in Kenya can be explained by other variables or factors not included in this study.

In addition, the F-statistic is used to test whether the model is a good fit for the data. Since the p-value (0.0002) is less than the significance level (0.000), the model is a good fit for the data. This implies that at least on the independent variables has a significant influence on the dependent variable.

Table 4. 2: Regression Coefficients

R	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
LogFX	-1723.686	683.3109	-2.52	0.013	-3075.734	-371.639
LogIR	-162.2897	609.1546	-0.27	0.790	-1367.606	1043.027
LogIn	-454.9339	106.6731	-4.26	0.000	-666.0049	-243.8629
_cons	13307.29	2553.238	5.21	0.000	8255.278	18359.31

The results show that the log of foreign exchange rate has a negative influence on stock market performance in Nairobi Security Exchange as shown by a regression coefficient of -1723.686. Since the p-value (0.013) is less than the significance level (0.05), we can reject the null hypothesis that “exchange rate has no significant effect on stock market performance in Nairobi Securities Exchange”. Therefore, exchange rate has a significant and negative effect on stock market performance in Nairobi Securities Exchange. These findings agree with Zubair (2013) findings that exchange rate has a negative influence on stock market performance in Nigeria. However, the findings are contrary to Tian and Ma (2010) findings that exchange rate has a positive influence on stock market performance in China.

The study established that the log of interest rate has an effect on stock market performance in Nairobi Securities Exchange as shown by a regression coefficient of -162.2897. However, since the p-value (0.790) was more than the significance level (0.05), the influence is not significant. Therefore we accept the null hypothesis that “interest rate has no significant effect on stock market performance in Nairobi Securities Exchange”. This implies that interest rate has no significant effect on stock market performance in Nairobi Securities Exchange. These findings are contrary to Thang (2009) findings that interest rate had a negative impact on the stock market index Malaysia.

The results show that inflation has an influence on stock market performance in Nairobi Securities Exchange as shown by a regression coefficient of -454.9339. Since the p-value (0.013) is less than the significance level (0.05), we can reject the null hypothesis that “inflation has no significant effect on stock market performance in Nairobi Securities Exchange”. Therefore, interest rate has a significant and negative effect on stock market performance in Nairobi Securities Exchange. These findings agree with Khumalo (2013) findings that inflation exerts a significant and negative impact on stock market performance in South Africa. However, the findings disagree with Katrakilidis et al. (2002) findings that there is positive relationship between the stock market returns and inflation in Greece.

Conclusions and Recommendations

The study concludes that foreign exchange rate has a negative effect on stock market performance in Nairobi Securities Exchange. The study also concludes that interest rate has no significant effect on stock market performance in Nairobi Securities Exchange. The study further concludes that inflation has a significant and negative effect on stock market performance in Nairobi Securities Exchange.

The study recommends that the policy makers and the central bank of Kenya (CBK) should plan in advance and influence the macro-economic variables such as inflation by developing policies to minimize inflation. Inflation should be curbed as it negatively affects stock market performance. Although the government of Kenya managed to curb interest rates in commercial banks in Kenya, the same is not extended to further financial institutions such as microfinance institutions. Therefore, the Central Bank of Kenya should seek to extend the interest rates capping policy to micro finance institutions. The study found foreign exchange rate influences stock market performance negatively. The study recommends that the policy makers as well as the Central Bank of Kenya should develop policies to curb the currently high foreign exchange rates.

Suggestions for Further Research

The study found that the three macroeconomic variables (foreign exchange rate, interest rate and inflation) explain 14.51% of the stock market performance in Nairobi Security Exchange. The study therefore suggests that further studies should be conducted on the other factors influencing stock market performance in Nairobi Security Exchange. In addition, the study was limited to three macroeconomic variables only and hence other studies should be conducted to focus on other macroeconomic variables like money supply and GDP.

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