

Effect of Selected Macro-Economic Variables on Securities Performance at the Nairobi Securities Exchange, Kenya



Maiyo chelanga Luka R¹, Elvis Kiano PhD², Kipruto Kemboi, PhD³

^{1,2,3}Department of Economics, Moi University

ABSTRACT: The equity securities market is an integral component of any country's financial system, and its performance is intertwined with the broader macro-economic environment. Equity securities market determines the state of the economy; this is through stock and asset prices fluctuations as well as company earnings with corresponding dividend policies, and multiple macroeconomic variables. The inherent problem has been how do changes in specific macro-economic variables affect the performance of the equity securities market at the Security Exchange. This study sought to establish the influence of the selected macro-economic variables on equity securities market performance at Nairobi Securities Exchange (NSE). The specific objectives were to establish the effects of exchange rate; interest rate; inflation rate; money supply; and Gross Domestic Product on equity share prices fluctuations based on the NSE-20 from when the economy was liberalized. The study was guided by the Capital Asset Pricing Model, the Arbitrage Pricing Theory and the Efficient Market Hypothesis. An explanatory research design was used to determine the effect of selected macro-economic variables on securities exchange market performance. Annual time series secondary data for the periods 1986 to 2022 was used. Findings of diagnostic test demonstrated that there was no multicollinearity among the independent variables, residuals were homoscedastic, and there was no autocorrelation among the residuals. The results of Shapiro wilk normality test showed that the study's variables were normally distributed. The Augmented dickey fuller unit root test both showed that there was no unit root and that the variables had a short run relationship. The study findings were: the exchange rate (indicating negative and significant effect on equity security indices; the interest rate indicating negative and significant effect on equity security indices; inflation rate indicating positive and significant effect on equity security indices; money supply which indicates a negative and significant effect on equity security indices; and gross domestic product had a positive and significant effect on equity security indices. The study concluded that exchange rate, interest rate and money supply significantly affect equity security indices negatively while inflation rate and gross domestic product significantly affect equity security indices positively. The study therefore recommends the Central bank of Kenya to employ measures intervening foreign exchange markets to stabilize the currency, implement appropriate interest rate policies, and maintaining adequate foreign exchange reserves. The policy makers should prioritize price stability and monitor the growth of money supply to ensure it remains in line with the country's economic fundamentals. Policy makers should also strike a delicate balance between controlling inflation and supporting economic growth by closely monitoring economic indicators and adjusting interest rates accordingly.

KEYWORDS: Exchange rate, Interest rate, Inflation, Money supply, Gross domestic product, Equity share prices.

1.0 INTRODUCTION

Securities performance is closely tied to market volatility, which refers to the degree of price fluctuations in financial instruments (Liu, Umair & Gao, 2023). Volatile markets can present both opportunities and risks (Wu, et al., 2020). Investors often seek to balance risk and return, aiming for securities that offer potential gains while mitigating losses (Laplane & Mazzucato, 2020). Assessing the historical volatility of securities provides insights into their potential future performance and aids in constructing diversified portfolios. The performance of securities is intricately linked to macroeconomic factors such as interest rates, inflation, and GDP growth (Kalbouneh et al., 2023). These factors influence investor sentiment and market trends. In times of economic expansion, securities performance tends to be positive as companies' earnings grow (Erlando, Riyanto & Masakazu, 2020). Conversely, economic downturns can lead to reduced securities performance due to lower corporate profits and increased risk aversion among investors.

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For individual stocks, factors like company earnings, revenue growth, debt levels, and competitive positioning impact securities performance (Ullah et al., 2020). Fundamental analysis involves evaluating these company-specific variables to estimate the intrinsic value of a security. For the purpose of helping in making investment decisions, investors check if a security is undervalued or overvalued by comparing its market price to its intrinsic value (Koski, 2020). To forecast the future performance of securities, technical analysis looks at past price patterns, trading volume, and market movements.

Traders use technical indicators and chart patterns to make short-term investment decisions, attempting to profit from price movements. Technical analysis also aids in market timing, helping investors identify potential entry and exit points. The regulatory environment significantly impacts securities performance. Regulations ensure fair practices, prevent market manipulation, and enhance transparency. Efficient markets, where securities' prices reflect all available information, are a cornerstone of modern finance theory. Investors and researchers study the efficiency of markets to understand the implications of publicly available information on securities performance.

Securities performance can also be influenced by psychological factors. Behavioral finance studies how investor emotions, biases, and cognitive errors impact decision-making and securities performance. Investor sentiment, fear of missing out, and herding behavior can drive market trends and contribute to securities' overvaluation or undervaluation. The Nairobi Securities Exchange is confronted with a significant challenge in the form of stock return volatility, as highlighted in the sessional document No. 10 of 2012 on Kenya Vision 2030. The volatility of the NSE 20 share index has had an impact on the stock returns of the publicly traded companies listed on the Nairobi Securities Exchange (Kamande, 2015).

The existence of volatility in the Nairobi Securities Exchange was confirmed by Kalui (2004), who linked it to various market causes. Nairobi Securities Exchange stock returns are extremely volatile, which makes investors wary of putting their money there. There is empirical evidence linking macroeconomic variables to stock return volatility, and some theories of finance, such as the Arbitrage Pricing Theory, take macroeconomic variables into account as possible predictors of stock return volatility. Results from the many empirical studies that have looked at how macroeconomic variables affect stock returns have been all over the outline. The effect of macroeconomic variables on stock returns is thus a topic of debate. Researchers Ouma and Muriu (2014) and Kirui (2014) used Ordinary Least Squares (OLS) theory to determine that interest rate had no statistically significant effect on stock return. A negative effect was, however, noted by Olweny and Omondi (2014) and Gatebi (2013). Olweny and Omondi (2014) and Ouma and Muriu (2014) both confirmed that inflation is significant, however Kirui (2014) came to the opposite conclusion. The study by Olweny and Omondi (2014) found that exchange rates positively correlated with stock returns, while the study by Kirui (2014) found no such correlation. By including a large number of macroeconomic variables, this study hoped to rectify the aforementioned shortcomings and provide solid results.

Macroeconomic variables refer to the underlying economic factors that possess the capacity to influence the performance of a nation's economy, as well as the returns of the stock market and the volatility of stock prices (Kitati et al., 2015). Illustrative instances encompass the level of employment or unemployment, rates of foreign exchange, gross domestic product, money supply, interest rate, rate of industrial production, and inflation rate. According to Olukayode and Akinwande (2009), macroeconomic variables refer to the variables that exert control over the macro-economy, including the whole of the economy. The existence, conduct, and outcomes of organizations are influenced by macroeconomic conditions. These factors can have a direct impact on competitors or an indirect effect on the business climate. According to Atanda (2012), the variables that exert significant influence on the economy include Gross Domestic Product (GDP), unemployment, exchange rate, and inflation. The present study employed many economic indicators, including exchange rate, rate of inflation, money supply, gross domestic product, as well as interest rate.

Inflation, as defined by Basu (2011), refers to a general increase in the prices of goods and services. The consumer price index and producer pricing index are widely employed as the primary indices for assessing inflation. The Price Performance Index (PPI) measures the mean cost of a collection of goods that a company utilizes to convert them into final products. According to Barnor (2014), the impact of inflation rates on securities indexes can be either beneficial or negative. Increased producer inflation leads to a decrease in firm earnings, a reduction in market expansion, and a subsequent rise in unemployment when companies stop hiring people. Stock prices fluctuate in response to indications from production indexes. The correlation between disposable income and inflation, as well as the subsequent decline in the production of vital goods and services, has been observed. Inflation diminishes the purchasing power of individuals with low income, resulting in their inability to obtain necessary goods and services. The value of one currency relative to another is determined by the exchange rate, which is described by Schiller (2008) as a quotation that evaluates this value directly or indirectly. It measures how much money would have to change hands in another country to buy the same assortment of products and services as in one's own. The exchange rate affects both the relative worth of domestic and foreign items and the demand for domestic goods from outside (Ncube & Ndou, 2011).

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Numerous studies have examined the utilization of nominal exchange rates as a means to assess fluctuations in international exchange rates, despite the possibility of evaluating them in real terms as well. There is a widespread belief that there is an inverse relationship between stock returns and exchange rates. As a result, an increase in exchange rates is believed to result in a decrease in stock returns, while a reduction in exchange rates is believed to lead to an increase in stock returns. This is demonstrated by good market theory. An increase in the value of the local prices causes a decrease in the demand for a nation's products because other countries are going to pay more. As a result, the stocks of companies in that nation will fall because investors will not be willing to invest in such businesses. This is in accordance with the theory of the market.

The portfolio balance theory elucidates the correlation between the stock markets and the exchange rate market, however the extent of this correlation remains uncertain and occasionally yields conflicting findings in empirical investigations. Gross domestic product (GDP) refers to the comprehensive monetary value of a nation's production throughout a designated time frame (Schiller, 2008). A reliable indicator for assessing economic recession and subsequent recovery is the gross domestic product per capita. Gross domestic product (GDP) is a metric that quantifies the total income generated by a nation through both domestic and foreign factors of production. The stock market return is directly influenced by significant fluctuations in gross domestic product, which can have either positive or negative effects. A positive economic forecast that anticipates economic growth is likely to result in an increase in stock prices, as a prudent investor would be inclined to purchase stocks in order to capitalize on the profits generated by a rising economy. Conversely, in the event of an anticipated economic crisis, it is seen that stock prices tend to decrease as investors choose to divest from their stocks and acquire instruments with lower risk, such as bonds.

According to Wang (2013), gross domestic product (GDP) is commonly regarded as the primary macroeconomic indicator for assessing total economic productivity in a country. The rate of growth in GDP serves as an indicator of the economic conditions during different phases. The data analysis in this study will employ actual numbers of Gross Domestic Product. The interest rate refers to the expense associated with obtaining a loan. An interest rate refers to the component of a loan that an investor requests in exchange for utilizing their funds. The interest rate is the percentage cost imposed by the lender on the borrower for loan money, given as a cost relative to the principal amount. The Central Bank of Kenya Lending Rate was employed as a proxy in this study to assess the interest rate.

According to Songole (2012), investors engage in the purchase of stocks with the most favorable interest rates, which is determined by the interplay of the money market mechanism in an economy (Darfor & Agyapong, 2010). The central bank, acting on behalf of the government, often adjusts interest rates as required to regulate the quantity of money in circulation. Numerous research examining the correlation between macroeconomic variables and stock returns have consistently demonstrated a considerable negative impact of interest rates on stock returns. According to Olweny's (2011) study, there was a substantial relationship between interest rates and stock returns among firms listed on the Nairobi Stock Exchange. The lending rate of the Central Bank of Kenya served as an indicator for interest rates in the context of this study.

Economic growth refers to the gradual increase in the level of output within an economy during a specified timeframe, often measured over a one-year period. Economic growth is very desirable as it signifies an overall increase in the wealth of individuals within an economy. There are several factors that contribute to economic growth, including technological advancements, increased demand for goods and services, and an expansion of the labor force, resulting in a reduction in unemployment rates. The money supply refers to the aggregate amount of money present within an economy during a specific period. The average annual monetary base (M3) is determined by calculating the total amount of currency in circulation and reserve balances. Money refers to a collection of liquid assets that serve as a means of trade and are commonly accepted for the purpose of debt repayment. In this capacity, it functions to optimize the utilization of limited resources allocated to transactions, enhance resources for manufacturing, facilitate commerce, foster specialization, and contribute to the overall well-being of a society. The present study employed M2 as a surrogate measure for assessing the money supply. The utilization of M2 in this study was justified due to its broader categorization of currency compared to M1, which solely encompasses liquid assets. The inclusion of M2 in this analysis was deemed pertinent due to its exclusion of assets with the lowest liquidity, as observed in M3. The money supply data is collected, recorded, and periodically published by the government or central bank of the country.

Sessional document No. 10 of 2012 on Kenya Vision 2030 notes that stock return volatility is a major issue confronting the Nairobi Securities Exchange. Companies listed on the Nairobi Securities Exchange have seen their stock returns impacted by the NSE 20 share index's historical volatility (Kamande, 2015). The Nairobi Securities Exchange experiences volatility due to a number of market conditions, as proven by Kalui (2004).

The Nairobi Securities Exchange (NSE) is a critical component of Kenya's financial infrastructure, serving as a platform for trading securities and facilitating capital formation (Aduda, Masila & Onsongo, 2012). The performance of securities at the NSE is not only influenced by internal factors but also by external macroeconomic variables. Kenya's economy has experienced significant fluctuations in recent years, with notable changes in inflation rates, interest rates, exchange rates, and other macroeconomic

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indicators (Murgor & Saxunova, 2022). These fluctuations have the potential to significantly affect the value and performance of securities traded at the NSE. Investors and stakeholders need to comprehend these dynamics to make rational investment decisions.

Investor trust in Nairobi Securities Exchange investment decisions is negatively impacted by stock return volatility (Obiny, 2022). Macroeconomic factors and stock return volatility have been related, with certain financial theories—such as Arbitrage Pricing Theory—viewing macroeconomic variables as determinants of stock return volatility. Contradictory findings have been found in a number of research on the impact of macroeconomic factors on stock performance. Therefore, opinions on how macroeconomic factors affect stock returns are divided. The researcher's motivation for this work has come from this. For instance, Ouma and Muriu (2014) and Kirui (2014) discovered, using OLS, that the interest rate had no discernible effect on stock return, but Gatebi (2013), Olweny and Omondi (2014), and others found the opposite. While Kirui (2014) concluded that inflation was small, Olweny and Omondi (2014), Ouma and Muriu (2014), and others proved inflation to be significant. While Kirui (2014) found the exchange rate to be inconsequential, Olweny and Omondi (2014) concluded that there was a favorable association between the exchange rate and the stock returns. In order to provide reliable findings, this study used a variety of macroeconomic variables to try to close the aforementioned gaps.

A few studies on the relationship between certain macroeconomic factors and the market returns of securities that are listed on the Nairobi Securities Exchange make reference to these companies. Songole (2012), for instance, concentrated on the connection between a few chosen macroeconomic factors and the Nairobi Securities Exchange's stock return. The study conducted by Mwangi, Makau, and Kosimbei (2014) investigated the correlation between non-financial companies listed on the Nairobi Securities Exchange and their capital structure and performance. Lastly, Karubari, (2017) concentrated on how certain macroeconomic factors affected the depth of the Nairobi Securities Exchange stock market. These studies, however, don't address the connection between certain macroeconomic variables and the success of the equities securities market as demonstrated by firms listed on the Nairobi Securities Exchange. The current study's goal is to examine how certain macroeconomic factors affect the performance of Nairobi Securities Exchange companies in the securities market.

2.0 LITERATURE REVIEW

Wu et al. (2010) measured the ratio between the value of domestic shares listed on domestic exchanges and GDP in their study using the equity market capitalization. They also used the stock market's liquidity as a proxy for the value of domestic share trading on domestic exchanges divided by the value of domestic shares that are listed. The results of the study showed that equity market development had a negative short-term impact on real output relative to its long-term effects. According to their research, while equity market capitalization and liquidity have positive long-term effects on economic development, they have a negative short-term impact on economic growth.

Diebold and Yilmaz's (2008) analysis found a one-way correlation between the volatility of the GDP and the equities market. Caporale and Spagnolo (2003) discovered that the volatility of the production growth was positively impacted by the equity market's volatility. However, a number of studies have provided empirical evidence of a reciprocal relationship between GDP growth volatility and stock market volatility. Using spectral analysis, Leon and Filis (2008) looked at Greece's quarterly GDP, investment, and stock market data. According to Leon and Filis (2008), changes in GDP can cause changes in equity market volatility, but changes in equities market volatility can also cause changes in GDP.

A number of research have been carried out to examine the relationship between GDP and stock returns. Most studies have found that future levels of real economic activity, measured by gross domestic product, will positively correlate with current stock levels (Geske & Roll, 1983; Chen et al., 1986; Sharma & Wongbangpo, 2002). In the economy, stock returns are influenced by how the GDP (gross domestic product) affects firm profitability. Increased output leads to expectations of increased earnings in the future, which in turn raises stock values. The converse also applies in the event of a recession in an economy.

Tursoy, Gonsel, and Rjoub (2008) used the Ordinary Least Squares (OLS) technique to investigate the correlation between 11 industrial portfolios and 13 macroeconomic indices, including the gross domestic product. Examining the effects of macroeconomic factors on the Istanbul Stock Exchange was the aim of this study. The results of the analysis show that there is no statistically significant correlation between stock returns and GDP. This phenomena may be explained by the variability of the relationship, which might show both positive and negative associations depending on the industry. Similar conclusions were drawn about the relationship between macroeconomic variables and stock returns in the Nigerian capital market index in a study by Osamuonyi and Evbayiro-Osagie (2012). It was discovered that the gross domestic product had little effect on stock returns in the Nigerian economy. On the other hand, the goal of Kirui, Wawire, and Onono's (2014) study was to evaluate the relationship between macroeconomic variables and stock returns inside Kenya's Nairobi Securities Exchange. The results of the analysis showed that there was no statistically significant relationship between stock return and GDP.

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Owusu-Nantwi and Kuwornu (2011) carried out research using a Ghanaian background. The study's conclusions show that interest rates have a comparatively small impact on stock returns in the Ghanaian stock market. The interest rate in the nation's stock market was calculated using the rate on 91-Treasury bills. The interest rate and stock return were found to be negatively correlated. The aforementioned result was obtained through the application of the Ordinary Linear Square methodology to the analysis of monthly data collected between 1992 and 2008. The research team's conclusions aligned with earlier investigations on contemporary society.

Onasanya and Ayoola (2012) used data from 1985 to 2008 and a Vector Error Correction Model (VECM) in their work. The purpose of the study was to look into the relationship between stock returns and macroeconomic variables. The researchers arrived at the conclusion that there was little to no impact of the macroeconomic factors on stock returns. The study's conclusions show that interest rates and stock returns in the Nigerian stock market are negatively correlated. However, the statistical insignificance of the observed negative association was determined.

Maswera and Kaberuka (2013) conducted a study in which they looked at the variables affecting the Uganda Security Exchange stock market. The study's conclusions show that interest rates and stock market performance inside the country have a negative relationship over a long period of time. Nevertheless, no statistically significant changes in this connection were seen in the short term.

Kirui, Wawire, and Onono (2014) looked into the relationship between macroeconomic variables and stock market performance on Kenya's Nairobi Securities Exchange. The analysis came to the conclusion that interest rates and stock returns are negatively correlated. As such, government authorities must maintain control over the extent to which interest rates fluctuate in the nation.

Choudhry (2001) looked into how inflation affected stock returns. Four major Latin American nations—Chile, Mexico, Argentina, and Venezuela—that were known for having high rates of inflation were the focus of the study. The results of the empirical analysis showed that every series in the study showed mean reversal at every level. In order to investigate the relationship between stock returns and inflation, the study used linear regression. The results showed that inflation levels had a significant effect on stock returns, mainly because they were lags rather than leads. The results also showed that there was an adverse relationship between inflation and stock returns during times of high inflation.

Maswera and Kaberuka's (2013) study examined macroeconomic variables from 2003 to 2011 in order to determine the factors impacting stock market prices in Uganda. The Phillip-Perron unit root test and the Augmented Dickey Fuller test were used to test the variables. The findings showed that while inflation was initially constant, later changes had a significant effect on the economy's stock prices.

On the other hand, Shilinde (2013) carried out research that looked at how macroeconomic factors affected Tanzania's economy. The study used the Johansen co-integration test and the Vector Autoregressive (VAR) framework to investigate the existence of long-lasting relationships between the variables. The results concerning inflation suggest that high rates of inflation have a noteworthy effect on stock returns in the Tanzanian economy.

Kirui, Wawire, and Onono (2014) conducted a study with the objective of evaluating the relationship between the GDP, inflation, Treasury bill rate, exchange rate, and stock return in relation to Nairobi Stock Exchange Limited.

In order to ascertain whether the inflation illusion was indeed influencing the relationship between stock return and inflation, Lee (2009) reevaluated the data. Using a larger sample period of data from US and international sources, the hypothesis was reexamined. The study looked at the pre-war era phenomena of overpricing in tandem with growing inflation. This implies that in both subsample periods, the mispricing component has a considerable impact on the link between the equity market and inflation. The relationships found before and after the conflict are consistent with the relative importance of these shocks.

In 2009, Rahman, Sidek, and Tafri carried a research to investigate the correlation between various macroeconomic variables and stock returns in the Kuala Lumpur Composite Index (KLCI), a proxy for the Malaysian stock market. The study utilized the Vector Autoregression (VAR) methodology with data collected between 1986 and 2008. The research study's conclusions show a significant and negative correlation between the exchange rate and stock market performance, which in turn affects stock returns.

Osamuonyi and Evbayiro-Osagie (2012) came to a similar conclusion when they examined the relationship between macroeconomic factors and stock returns in the Nigerian capital market index. The study used annual exchange rate data from 1975 to 2005 and the Vector Error Correction Model (VECM) to investigate the short- and long-term relationships between exchange rates and stock returns.

Aurangzeb (2012) came to a similar result in his investigation of the variables influencing the stock market's performance in South Asian nations. The author used monthly data for India, Pakistan, and Sri Lanka—three South Asian nations—that ranged from 1997 to 2010. Descriptive statistics were used in the study's analysis. The study's conclusions showed that exchange rates had a significant and positive effect on stock market performance in each of the three countries. As a result, exchange rates and stock returns showed a strong and positive association.

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Adarmola (2012) conducted a study wherein the behavior of the Nigerian stock market and the volatility of currency rates were examined. The study used an error correcting mechanism and Johansen's Co-integration Technique, and the results were similar to those published in the previously stated articles. The study comprised quarterly information from 1985 to 2009. The study's conclusions show that the exchange rate had a significant impact on the Nigerian stock market during both short- and long-term timeframes. Based on the investigation's findings, it was determined that the exchange rate had a positive short-term impact on the stock market's performance or returns. On the other hand, over an extended period of time, the study's results also showed a statistically significant negative correlation between the exchange rate and stock returns.

Ouma and Muriu (2014) used the frameworks of Arbitrage Pricing Theory (APT) and Capital Asset Pricing Model (CAPM) to examine how macroeconomic factors affected stock returns in Kenya from 2003 to 2013. Monthly data were the main focus of the analysis. The Ordinary Least Squares (OLS) method was employed in this study to evaluate the model's viability and ascertain the relative importance of the several variables that could affect stock returns. Two fascinating results emerged from the empirical investigation. Each variable is first represented by the letter I(0). Moreover, there is a strong correlation between macroeconomic factors and stock market returns—interest rates excluded. The study's conclusions imply that there is a connection between Kenya's stock market performance, money supply, inflation, and exchange rates.

3. RESEARCH METHODOLOGY

3.1 Research Design

Explanatory research design was used for this study in order to determine the amount and type of the relationships between the variables under consideration as well as their causes and effects. The study period was 1986 to 2022.

3.2 Data Type and Source

This research study made use of a secondary type of data. The World Bank, the Central Bank of Kenya, and the Kenya National Bureau of Statistics (KNBS) were consulted for the statistics. The study employed Auto-regressive Distributed Lag (ARDL) model for analysis. The table shows how the study variables were measured.

Variable	Definition	Measurement
Equity securities market performance	Refers to the evaluation and measurement of how well stocks or equity securities are doing within a specific market, such as a stock exchange or a broader equity market index (Almagtome & Abbas, 2020).	NSE indices
Interest rate	is the cost of borrowing money or the return on investment for lending or saving money (Alper et al.,2020)	Annual interest rate
Inflation rate	is a measure of the percentage increase in the general price level of goods and services in an economy over a specific period of time (Liu & Lee, 2021)	Consumer price index
Exchange rate	is the rate at which one currency can be exchanged for another (Edwards, 2019).	Annual Ksh/USD
Money supply	is the total amount of money available in an economy at a given point in time (Qing & Kusairi, 2019).	M3
Gross domestic product	is a key economic indicator that measures the total monetary or market value of all goods and services produced within the borders of a country in a specific time period, typically a year or a quarter (Coscieme et al., 2020)	Real GDP

3.3 Model specification

Equation below shows the regression model of the independent variables against the dependent variable

$$ESM_t = \beta_0 + \beta_1 ER_t + \beta_2 IF_t + \beta_3 IT_t + \beta_4 MS_t + \beta_5 GDP_t + \epsilon_t$$

Where;

ESM = Equity Securities Market index

β_i the model coefficients

ER: =Exchange rate.

IF= Inflation

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IR =Interest rate

MS=Money supply

GDP= Gross Domestic Product

ϵ = is the error term.

t = is time element

A transformed analytical model using natural log (Ln) to standardize the variable representation (unify the elasticity)

$$\ln \text{ESM}_t = \beta_0 + \beta_1 \ln \text{ER}_t + \beta_2 \ln \text{IF}_t + \beta_3 \ln \text{IT}_t + \beta_4 \ln \text{MS}_t + \beta_5 \ln \text{DP}_t + \epsilon_t$$

3.4 Data Analysis Method

The Augmented Dickey-Fuller Unit Roots Test (ADF) was used to test the unit test of the given model. The Breusch-Pagan heteroscedasticity test was used to determine heteroscedasticity. To determine whether there is a correlation between the independent variables in the regression model, the study used the Variance Inflation (VIF) factor test. Co-integration was ascertained using the ARDL bound tests developed by Pesaran, Shin, and Smith (2001). The Breusch-Godfrey test of autocorrelation was used to measure autocorrelation. In this work, the optimal lag duration of the ARDL model was determined using the following criteria: the Akaike Information Criterion (AIC), Final Prediction Error (FPE), Hannan-Quinn Criterion (HQIC), and Schwartz Information Criterion (SIC). The cumulative sum of recursive residuals (CUSUM) test was also used to examine the parameter stability of the time series model.

4. ANALYSIS AND DISCUSSION

4.1. Descriptive statistics

Table 4.1 outlines the summary of descriptive statistics of variables that were employed in this study. These descriptive statistics entails mean, standard deviation, minimum and maximum values. Mean is used as a yardstick of central value of the entire dataset in the observation. The standard deviation is used shows the extent to which dataset spreads from the central values.

From the table 4.1, the mean of the interest rate is 7.8967 (standard deviation =6.8991; Minimum=-10.096; Maximum=21.0963). Higher value of interest rate is an indicator of a tight monetary policy in an economy while low interest rate is an indicator of an expansionary monetary policy. It can be concluded from the results that on average for the last 37 years, interest rate in Kenya has been 7.8967. Further, the gap between the minimum value and the maximum value implies interest rate in Kenya has been fluctuating with some periods recording high values while other periods recording low values. The extent of variation from the mean of interest rate was high as indicated by a higher value of standard deviation of 6.8991.

The graphical representation of the interest rate from 1986 to 2022 is shown in Figure 4.1. The interest rate has varied significantly over all of the years, with 1998 recording the highest rate at 21.096 and 2009 recording the lowest rate at -10.096. Between the years 2010 and 2022, interest rates have maintained a relatively stable, steady level with only very slight shifts.

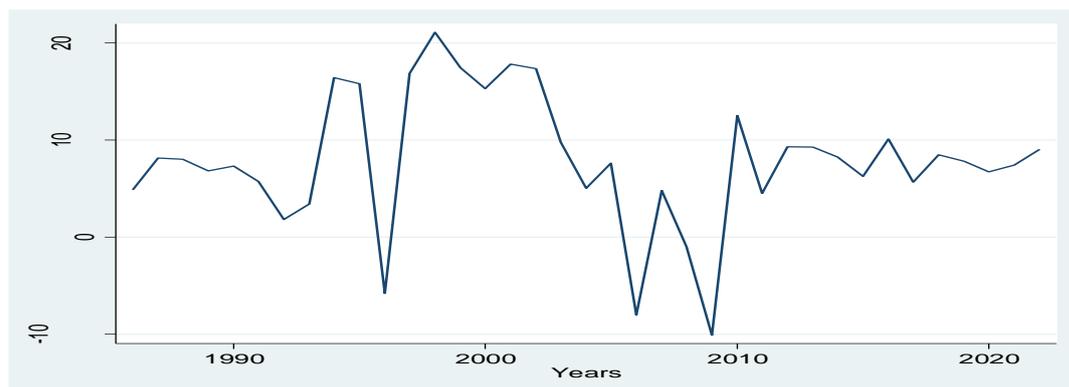


Figure 4.1: Graphical Representation of Interest Rate

From the table 4.1, the mean of the exchange rate is 69.8031 (standard deviation =28.4718; Minimum=16.2257; Maximum=117.866). Higher value of exchange rate is an indicator of stronger currency while low interest rate is an indicator of weak currency. It can be concluded from the results that on average for the last 37 years, exchange rate in Kenya has been 69.8032. Further, the gap between the minimum value and the maximum value implies exchange rate in Kenya has been fluctuating with some periods recording high values while other periods recording low values. The extent of variation from the mean of exchange rate was high as indicated by a higher value of standard deviation of 16.2257.

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The exchange rate from 1986 to 2022 is graphically represented below in figure 4.2, which spans the years 1986 to 2022. From 1986 through 1995, there was an overall rising trend in the currency exchange rate. From 1995 through 2010, there were oscillations, with some years recording a rise and some years recording a decline. The overall trend, however, was generally upward. Nevertheless, the degree of volatility seen in exchange rates has been growing from the year 2010 to 2022.

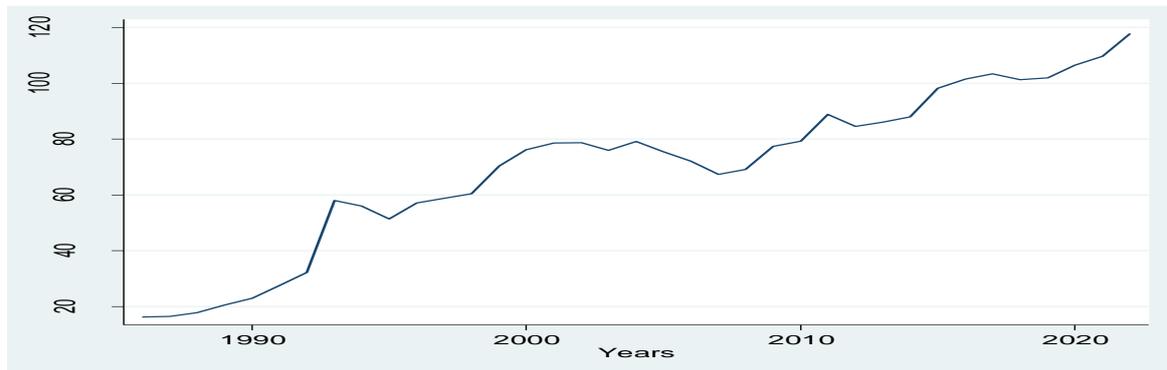


Figure 4.2: Exchange rate graphical representation

From the table 4.1, the mean of the inflation rate is 11.0952 (standard deviation =8.850691; Minimum=1.554328; Maximum=45.97888). Higher value of inflation rate is an indicator of high cost of living while low inflation rate is an indicator of low cost of living. It can be concluded from the results that on average for the last 37 years, inflation rate in Kenya has been 11.0952. Further, the gap between the minimum value and the maximum value implies inflation rate in Kenya has been fluctuating with some periods recording high values while other periods recording low values. The extent of variation from the mean of inflation rate was high as indicated by a higher value of standard deviation of 8.850691.

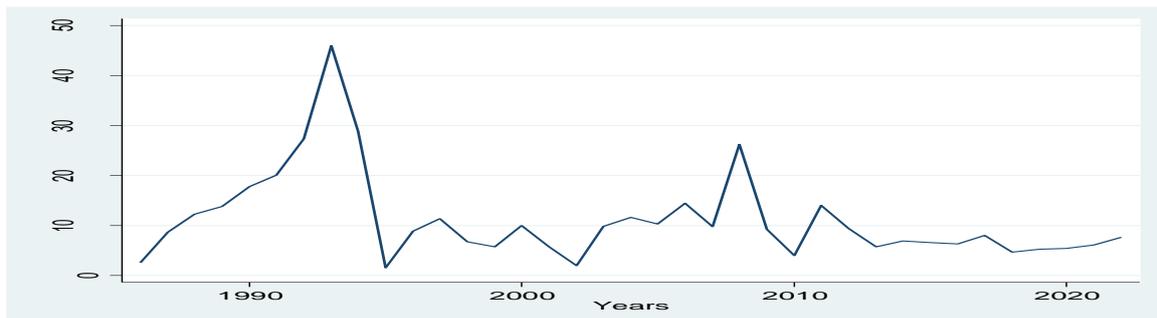


Figure 4.3: Inflation rate graphical representation

The inflation rate from 1986 to 2022 is depicted graphically in Figure 4.3 above. From 1986 to 1993, the inflation rate rose significantly. The recession of the late 1980s and early 1990s may be to blame. Since then, the inflation rate has fluctuated, with some periods exhibiting an inflation rate increase and others exhibiting an inflation rate decrease. The maximum rate of inflation was recorded in 1993, while the lowest rate was recorded in 1995.

From the table 4.1, the mean of the money supply is $1.24e+12$ (standard deviation = $1.41e+12$; Minimum= $3.57e+10$; Maximum= $4.69e+12$). It can be concluded from the results that on average for the last 37 years, money supply in Kenya has been $1.24e+12$. Further, the gap between the minimum value and the maximum value implies money supply in Kenya has been increasing over years. The extent of variation from the mean of money supply was high as indicated by a higher value of standard deviation of $1.41e+12$

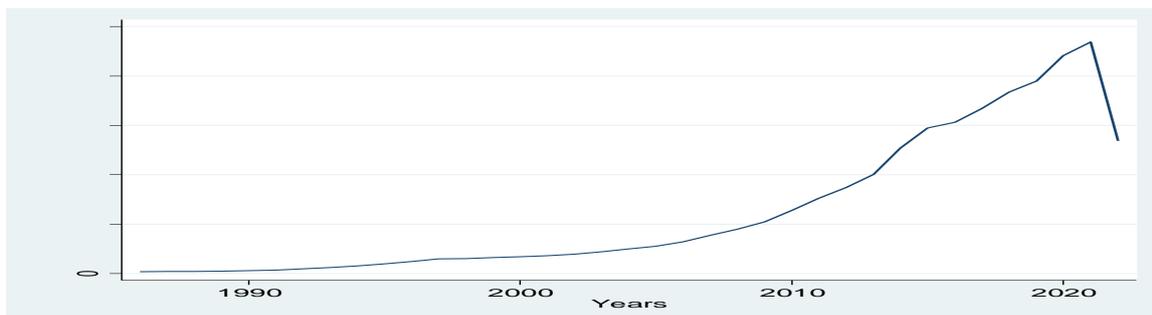


Figure 4.4: Money supply graphical representation

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The graphical representation of the money supply from 1986 to 2022 is shown in Figure 4.4. From 1986 to 2022, the trend of money supply shows a general upward trajectory with some fluctuations. The money supply data indicates a significant increase over the years. From 1986 to the early 1990s, the money supply experienced steady growth, more than doubling by 1995. The growth rate accelerated further in the late 1990s and early 2000s, reaching a peak in 2008. This period saw a substantial increase in the money supply, reflecting economic expansion and potential monetary stimulus. However, the global financial crisis in 2008 had an impact, leading to a temporary decline in the growth rate. Following the crisis, the money supply continued to increase, with varying growth rates. Notably, there was a sharp increase in money supply from 2020 to 2021, likely influenced by fiscal and monetary measures implemented to address the economic challenges caused by the COVID-19 pandemic. The data for 2022 shows a decrease compared to the previous year, suggesting a possible change in the growth trajectory. Overall, the trend indicates a generally increasing money supply, reflecting economic growth, monetary policies, and macroeconomic conditions.

From the table 4.1, the mean of the GDP is $3.72e+10$ (standard deviation = $3.45e+10$; Minimum = $5.75e+09$; Maximum = $1.13e+11$). It can be concluded from the results that on average for the last 37 years, GDP in Kenya has been $3.72e+10$. Further, the gap between the minimum value and the maximum value implies GDP in Kenya has been increasing over years. The extent of variation from the mean of GDP was high as indicated by a higher value of standard deviation of $3.45e+10$.

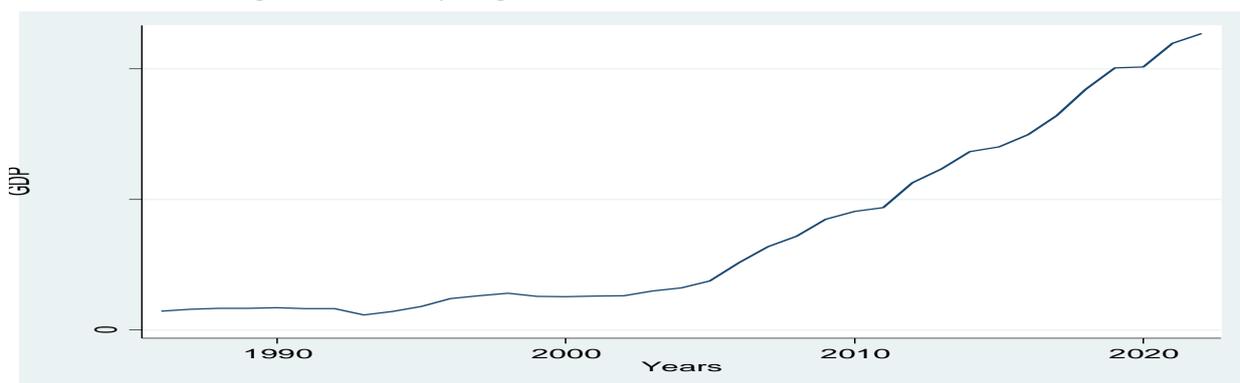


Figure 4.5: GDP graphical representation

The graphical representation of the GDP from 1986 to 2022 is shown in Figure 4.5. From 1986 to 2022, the trend of GDP (Gross Domestic Product) shows a generally increasing trajectory with some fluctuations. The GDP data indicates periods of growth and temporary setbacks. The GDP experienced relatively steady growth from the late 1980s to the mid-1990s, with some fluctuations along the way. There was a notable increase in GDP from the mid-1990s to the early 2000s, reflecting a period of economic expansion. However, there was a dip in GDP in 2009, likely due to the global financial crisis. Following the crisis, GDP recovered and continued to grow, reaching new highs in subsequent years. The data shows a consistent upward trend in GDP from 2012 to 2022, indicating sustained economic growth. Notably, there was a significant increase in GDP from 2020 to 2021, possibly influenced by fiscal stimulus measures and economic recovery efforts following the COVID-19 pandemic. The data for 2022 indicates further growth in GDP, highlighting the ongoing economic expansion. Overall, the trend suggests a generally positive trajectory for the economy, reflecting periods of growth and resilience in the face of challenges.

From the table 4.1, the mean of the equity performance index is 16.99195 (standard deviation = 38.24838; Minimum = -40.30563; Maximum = 186.21). It can be concluded from the results that on average for the last 37 years, equity performance index in Kenya has been 16.99195. Further, the gap between the minimum value and the maximum value implies equity performance index in Kenya has been increasing over years. The extent of variation from the mean of equity performance index was high as indicated by a higher value of standard deviation of 38.24838.

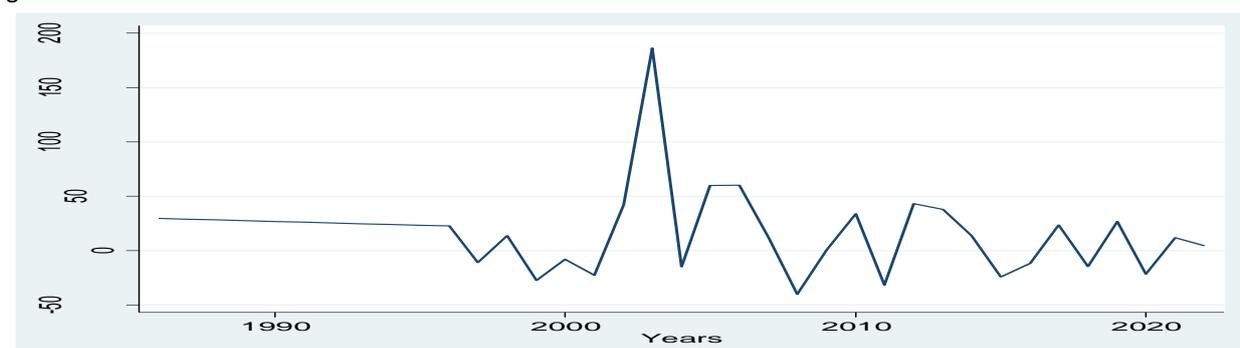


Figure 4.6: Equity performance index graphical representation

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The graphical representation of the equity performance index from 1986 to 2022 is shown in Figure 4.6. From 1986 to 2022, the trend of the equity performance index shows a mixed pattern with periods of growth, decline, and volatility. The index experienced relatively stable performance during the late 1980s and early 1990s, with minor fluctuations. However, there was a significant decline in the index in 1997, followed by a substantial increase in 1998. The year 1999 saw a significant downturn, and the index experienced further volatility in the early 2000s. The year 2002 stood out with a notable increase in the index, followed by a significant surge in 2003. The index experienced fluctuations and negative performance in subsequent years, notably with a sharp decline in 2008 during the global financial crisis. The years 2010 and 2012 showed positive growth, but 2011 saw a significant decline. The index experienced a mix of positive and negative performance from 2013 to 2019. In 2020, the index declined sharply, likely due to the economic impact of the COVID-19 pandemic. The following years showed some recovery and moderate growth. Overall, the trend of the equity performance index reflects a combination of market ups and downs, influenced by various economic and financial factors over the years.

Table 4.1: Results of Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Interest rate	37	7.896658	6.899123	-10.096	21.09633
Exchange rate	37	69.80315	28.47182	16.22574	117.866
Inflation rate	37	11.0952	8.850691	1.554328	45.97888
Money Supply	37	1.24e+12	1.41e+12	3.57e+10	4.69e+12
Gdp	37	3.72e+10	3.45e+10	5.75e+09	1.13e+11
Equity index	37	16.99195	38.24838	-40.30563	186.21

4.2 Pearson Correlation Analysis

The correlation's results are summarized and presented in table 4.2. Despite a high R-squared, the correlation between independent variables is evaluated due to the possibility of a very high standard error, a low t-statistic, and unanticipated changes in the signs or magnitudes of coefficients. The pair-wise correlation matrix of the independent variables reveals that no two variables exhibit an exceptionally high degree of collinearity.

Results in Table 4.2 indicate that Exchange rate is negatively related with Inflation rate ($r = -0.3337$, $p < 0.05$). Consequently the higher the exchange rate, the lower the inflation rate. Results further show that money supply is positively related with exchange rate ($r = 0.7933$, $p < 0.05$). Therefore, the higher the money supply, the higher exchange rate. Gdp was positively correlated to exchange rate ($r = 0.8092$, $p < 0.05$). The higher the Gdp, the higher the exchange rate. Money supply was negatively correlated to inflation rate and significant at 5 percent level of significance ($r = -0.3586$, $p < 0.05$). The higher the money supply the lower the inflation rate. Gdp was negatively correlated to inflation rate ($r = -0.3582$, $p < 0.05$). The higher Gdp the lower the inflation rate. Gdp was positively correlated to money supply ($r = 0.9694$, $p < 0.05$). The higher the Gdp the higher the money supply.

Table 4.3: Results of Correlation Analysis

	NSE Index	Interest rate	Exchange rate	Inflation rate	Money supply	Gdp
NSE Index	1.0000					
Interest rate	-0.0364	1.0000				
Exchange rate	-0.1985	0.0448	1.0000			
Inflation rate	0.0119	-0.2760	-0.3337*	1.0000		
Money supply	-0.2354	-0.0668	0.7933*	-0.3586*	1.0000	
Gdp	-0.2307	-0.1024	0.8092*	-0.3582*	0.9694*	1.0000

Note: * 5% significance level

Source: (Field data, 2023).

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4.3 Normality Test

The Shapiro-Wilk Normality test was employed to verify normality. The findings displayed in Table 4.3 indicate that the λ -value exceeds the threshold of 0.05. Based on the findings, it is not possible to reject the null hypothesis that the residuals follow a normal distribution. Consequently, the conclusion drawn is that the data exhibits a normal distribution.

Table 4.4: Shapiro Wilk Normality test

Variable	Obs	W	V	Z	Prob>z
Interest rate	37	0.94423	2.077	1.530	0.06295

Source: Field data (2023)

4.4 Autocorrelation Test

The Breusch Godfrey LM test was employed to examine the presence of autocorrelation. The data displayed in table 4.4 indicate that the p-values are 0.7874, which is greater than 0.05. Hence, the null hypothesis of the test, which posits the absence of a correlation, cannot be rejected. The findings were further validated by the utilization of the Durbin Watson test, which yielded a value of 2.0865. According to prevailing convention, it is generally accepted that the absence of serial correlation is indicated when the test statistic values fall within the range of 1.5 to 2.5.

Table 4.5: Breusch Godfrey LM test results

Source	chi2	df	Prob>chi2
Breusch Godfrey LM test for Autocorrelation(lags(1))	0.073	1	0.7874
Durbin Watsin Test d statistic (6, 37)			2.0865

Source: (Field data, 2023).

4.5 Heteroskedasticity Test

The heteroscedasticity test for residuals was assessed using the Breusch-Pagan test. The null hypothesis of homoscedasticity was contrasted to the alternative hypothesis of heteroscedasticity. According to Breusch and Pagan (1979), the acceptance of the null hypothesis of homoscedasticity is dependent upon the p values associated with the chi-square test statistics exceeding the predetermined threshold of significance of 5 percent. Conversely, if the p values are below the aforementioned level of significance, the null hypothesis is rejected. Table 4.5 displays the test results, which demonstrate that the residuals of the model exhibit homoscedasticity. The p values for the chi-square test results of 0.9740, which exceed the 5% level of significance (0.05), provide support for this conclusion.

Table 4.6: Heteroskedasticity Test results

Source	chi2	Df	Prob>chi2
Heteroscedasticity	9.66	20	0.9740

Source: (Field data, 2023).

4.6 Multi-collinearity Test

Multicollinearity refers to the presence of a strong correlation between two or more predictor variables. In order to assess the presence or lack of multicollinearity, the study employed the Variance Inflation Factor (VIF) and the correlation matrix. According to Gujarati (2012), the presence of multicollinearity can be identified when the Variance Inflation Factor (VIF) exceeds 10 or when the pairwise correlation coefficients above 0.8. According to Table 4.5, the Variance Inflation Factor (VIF) is 8.27, which is below the threshold of 10. This suggests that the study variables are not affected by multicollinearity.

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Table 4. 7: Multi-collinearity test results

Variable	VIF	1/VIF
Gdp	18.89	0.052950
Money supply	16.94	0.059036
Exchange rate	3.05	0.328381
Inflation rate	1.29	0.772885
Interest rate	1.21	0.829834
Mean VIF	8.27	

Source (Field data, 2023).

4.7 Stationarity Results

From the results of the table below, the null hypothesis of unit root of interest rate, exchange rate, inflation rate, money supply, GDP and Equity performance index is rejected at 5 percent level of significance. This suggests that interest rate, exchange rate, inflation rate, money supply, GDP and Equity performance index do not have a unit root which means they are stationary.

Table 4.8: Stationarity test results

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Interest rate	-5.523	-3.675	-2.969	-2.617
Exchange rate	-5.997	-3.675	-2.969	-2.617
Inflation rate	-4.972	-3.675	-2.969	-2.617
Money supply	-8.890	-3.675	-2.969	-2.617
Gdp	-8.005	-3.675	-2.969	-2.617
Nseindex	-5.717	-3.675	-2.969	-2.617

Source: Field data (2023)

4.8 Lag Selection Criteria

The best lag duration of the ARDL model was determined in this study using the Akaike Information Criterion (AIC), Final Prediction Error (FPE), Hannan-Quinn Criterion (HQIC), and Schwartz Information Criterion (SIC). Nevertheless, particular attention was devoted to the Akaike Information Criterion (AIC) and Final Prediction Error (FPE). Liew (2004) asserts that the Akaike Information Criterion (AIC) and Final Prediction Error (FPE) are particularly well-suited for the analysis of small data sets or datasets with less than 60 observations. AIC and FPE decrease the probability of underestimating, hence enhancing the probability of achieving the optimal lag duration in a model. The criteria for selecting the lag order for all variables in the study are presented in Table 4.8. These criteria include the Akaike Information Criterion (AIC), Final Prediction Error (FPE), Hannan-Quinn Criterion (HQIC), and Schwartz Information Criterion (SIC). The Akaike Information Criterion (AIC) recommends that the autoregressive distributed lag (ARDL) model should use four lags.

Table 4.9: Lag Selection Criteria Results

Lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	-2313.89				1.2e+56	140.478	140.539	140.659
1	-2217.68	192.42	16	0.000	9.4e+53	135.617	135.922*	136.524*
2	-2208.97	17.416	16	0.359	1.5e+54	136.059	136.608	137.691
3	-2178.14	61.657	16	0.000	7.0e+53*	135.16	135.954	137.518
4	-2161.97	32.335*	16	0.009	9.0e+53	135.15*	136.188	138.234

Source: (Field data, 2023).

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4.9 Co-integration Test

According to Gregory Hansen's co-integration test, the null hypothesis posits the absence of co-integration at the break point, while the alternative hypothesis suggests the presence of co-integration at the break point, with a significance level of 5 percent. The null hypothesis is rejected when the absolute values of the zt statistics surpass the crucial threshold of 5 percent. This observation indicates that the linear combination of the variables demonstrates consistent characteristics over an extended period, but with occasional structural disruptions. The assessment of the structural rupture was conducted utilizing the zt test distribution.

The findings of the Gregory Hansen cointegration test for structural breakdowns in the level are presented in Table 4.9. The magnitudes of the zt test statistics, which are 4.43, are smaller than the asymptotic critical value of 5.44, which represents the 5 percent limit. The acceptance of the null hypothesis, which posits the absence of co-integration at the break point, and the rejection of the alternative hypothesis, which suggests the presence of co-integration at the break point, were observed. Consequently, it can be inferred that there was an absence of a sustained association between the variables.

4.9.1 Gregory-Hansen Test with break in level (break in the level)

Table 4.10: Gregory-Hansen Test with break in level (break in the level) results

	Test Statistic	Breakpoint	Date	5% Asymptotic Critical Value
ADF	-4.43	6	1991	-5.44
Zt	-4.49	6	1991	-5.44

Source: (Field data, 2023).

4.9.2 Gregory-Hansen Test for Co-integration with Regime Shifts (break in Regime)

Table 4.10 shows the results for Gregory Hansen cointegration test for structural breaks in the regime. The absolute values of zt test statistics of 4.49 are less than the 5 percent asymptotic critical value of 5.44. The null hypothesis of no co-integration at the break point was accepted and the alternative hypothesis of co-integration at the break point was rejected. This therefore means that there was no long run relationship among the variables.

Table 4.11: Gregory Hansen cointegration test for structural breaks

	Test Statistic	Breakpoint	Date	5% Asymptotic Critical Value
ADF	-4.43	6	1991	-5.44
Zt	-4.49	6	1991	-5.44

Source: (Field data, 2023).

4.10 Parameter Stability Test

The CUSUM test was used to assess the consistency of the model's variables. It made it possible to monitor the evolution of the estimated coefficient as the sample size of the data used to make the estimation increased. There are two standard error ranges on either side of the calculated coefficients. If there is a significant variation in the coefficient when new information is introduced into an estimation equation, this is a distinct indication that the system is unstable. If the blue line is located outside of the two red lines, this is an unmistakable indication of instability.

The results of the CUSUM and CUSUM of squares are displayed in Figures 4.7 and 4.8. The blue lines were within the red lines, as depicted by the two graphs. This indicates that the variables utilized in the model remained consistent over time. Figure 4.7 depicts the numerous residual graphs of the model's variables. The variables' residuals fluctuate around the mean. This conforms to the assumption of normality that the residuals have a mean of zero.

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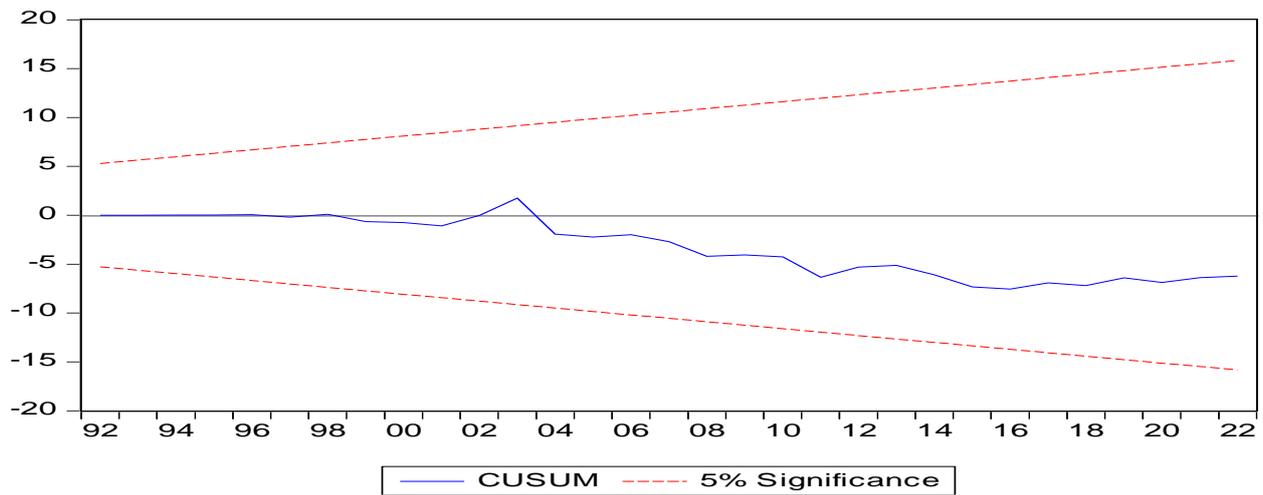


Figure 4.7: Cusum graph

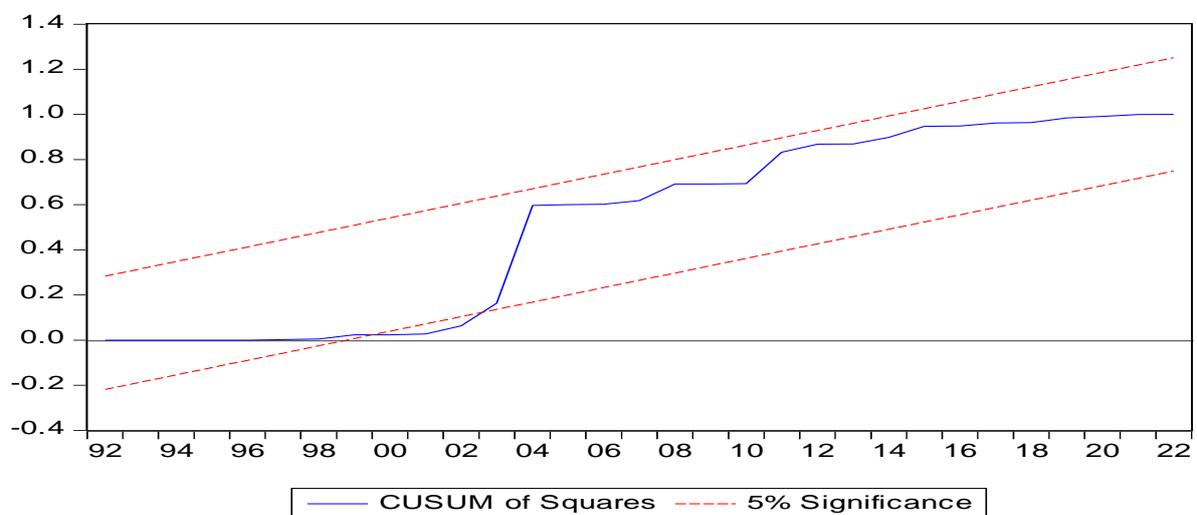


Figure 4.8: Cusum of squares graph

4.11 Discussion of ARDL results

Table 4.12: ARDL Test Results

Sample: 1990-2022	Number of obs	=	33		
	F(2,358)	=	5193.60		
	Prob > F	=	0.0000		
	R-squared	=	1.0000		
	Adj R-squared	=	0.9998		
Log likelihood = -4.9426718	Root MSE	=	0.5983		
Variable	Coef.	Std. Err.	t	p>t	[95% Conf. Interval]
nseindex					
L1	1.18962	.1109209	10.72	0.000	.8816545 1.497586
L2	-1.701016	.1917524	-8.87	0.001	-2.233406 -1.168626
L3	.9289012	.1058428	8.78	0.001	.6350346 1.222768
L4	.5015541	.0907663	5.53	0.005	.2495464 .7535619
Interest rate					
L1	-.3469313	.0305245	-11.37	0.000	-.4316809 -.2621817
L1	.3119061	.0566127	5.51	0.005	.1547241 .4690881
L2	-.4288249	.0353078	-12.15	0.000	-.526855 -.3307949

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L3	.3824891	.05471	6.99	0.002	.2305898	.5343884
L4	-.4262062	.0410089	-10.39	0.000	-.5400653	-.3123472
Exchange rate	-.0146571	.0001068	137.23	0.000	.0143606	.0149537
L1	-.0169246	.0015636	-10.82	0.000	-.0212658	-.0125834
L2	.0236187	.0026837	8.80	0.001	.0161676	.0310697
L3	-.0131567	.0014826	-8.87	0.001	-.017273	-.0090403
L4	-.0060815	.0012657	-4.80	0.009	-.0095958	-.0025673
Inflation rate	.2377357	.0341427	-6.96	0.002	-.3325311	-.1429403
L1	.293814	.0479017	6.13	0.004	.1608174	.4268105
L2	-.5611202	.0620455	-9.04	0.001	-.7333862	-.3888542
L3	.0465851	.0271844	1.71	0.162	-.028891	.1220611
Money supply	-1.51e-13	7.59e-15	-19.90	0.000	-1.72e-13	-1.30e-13
L1	1.80e-13	1.48e-14	12.19	0.000	1.39e-13	2.21e-13
L2	-1.91e-13	2.58e-14	-7.42	0.002	-2.63e-13	-1.20e-13
L3	1.35e-13	1.62e-14	8.36	0.001	9.04e-14	1.80e-13
L4	-2.25e-14	1.30e-14	-1.73	0.159	-5.86e-14	1.37e-14
Gdp	1.10e-09	2.04e-10	5.36	0.006	5.28e-10	1.66e-09
L1	-2.59e-09	2.64e-10	-9.79	0.001	-3.32e-09	-1.85e-09
L2	1.86e-09	1.88e-10	9.94	0.001	1.34e-09	2.39e-09
L3	-6.94e-10	1.43e-10	-4.87	0.008	-1.09e-09	-2.98e-10
L4	3.38e-10	1.70e-10	1.98	0.119	-1.36e-10	8.11e-10
cons	7.485306	2.156742	3.47	0.026	1.49723	13.47338

Source: (Field data, 2023).

H₀₁: Exchange rate has no significant effect on equity security market indices in Kenya. The results presented in Table 4.12 show that exchange rate has a significant negative effect on equity performance index ($\beta_1 = -.0147$ $p\text{-value} < 0.05$); hence, (H_01) was rejected. A one-unit increase in the exchange rate is associated with a decrease in the equity performance index by 0.0147 units. In other words, when the exchange rate rises, it tends to have a negative impact on the equity performance index. This relationship suggests that a stronger domestic currency or depreciation in the exchange rate can potentially lead to improved equity performance. These results are in agreement with another study that was done by Osamuonyi and Evbayiro-Osagie (2012). Depreciation in the exchange rate tends to make imported goods and services relatively more expensive. As a result, companies that rely heavily on imports for their operations may face higher production costs, leading to a decrease in profitability. This can negatively impact the overall performance of these companies, which are typically included in equity indices. Secondly, depreciation in the exchange rate can increase the cost of foreign debt for companies that have borrowed in foreign currencies. This can put financial strain on these companies, impacting their profitability and subsequently affecting the performance of the equity market indices. Thirdly, depreciation in the exchange rate can lead to inflationary pressures in an economy. Higher inflation can erode consumer purchasing power and reduce overall economic growth. This can dampen investor sentiment and lead to a decrease in equity market performance. Furthermore, the exchange rate serves as a signal of a country's economic stability and attractiveness to foreign investors. A volatile or depreciating exchange rate may lead to a loss of investor confidence, resulting in capital outflows from the equity market and a decline in stock prices

H₀₂: Interest rate has no significant effect on equity security market indices in Kenya. The results presented in Table 4.12 show that interest rate has a significant negative effect on equity performance index ($\beta_2 = -.3469$ $p\text{-value} < 0.05$); hence, (H_01) was rejected. A one-unit increase in the interest rate is associated with a decrease in the equity performance index by 0.3469 units. In other words, when interest rates rise, it tends to have a negative impact on the equity performance index. This relationship suggests that higher interest rates can potentially lead to decreased investor confidence and reduced investment in the equity market, resulting in lower equity performance. These results are in agreement with another study that was done by Maswere and Kaberuka (2013). The inverse relationship between interest rates and equity security market indices in can be attributed to several

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factors. Firstly, higher interest rates increase borrowing costs for businesses and individuals, which can lead to decreased investment and reduced consumer spending. This can negatively impact the profitability and growth prospects of companies listed in the equity market, ultimately affecting the performance of equity indices. Additionally, higher interest rates can make fixed-income investments, such as bonds or savings accounts, more attractive relative to equity investments. This can divert funds away from the equity market, resulting in decreased demand for equities and potential downward pressure on stock prices. Furthermore, higher interest rates can reflect tighter monetary policy aimed at controlling inflation. This can dampen economic activity and investor sentiment, leading to a decrease in equity market performance. Overall, the inverse relationship between interest rates and equity security market indices in Kenya suggests that changes in interest rates can have a significant impact on investor behavior, investment decisions, and ultimately the performance of the equity market.

H₀₃: Inflation rate has no significant effect on equity security market indices in Kenya. The results presented in Table 4.12 show that inflation rate has a significant positive effect on equity performance index ($\beta_3 = 0.2377$ $p\text{-value} < 0.05$); hence, (H₀₁) was rejected. A one-unit increase in the inflation rate is associated with an increase in the equity performance index by 0.2377 units. In other words, when the inflation rate rises, it tends to have a positive impact on the equity performance index. This relationship suggests that higher inflation can potentially lead to increased investor confidence and reduced investment in the equity market, resulting in lower equity performance. These results are in contradiction with another study that was done by Mohammad (2011). Moderate levels of inflation often coincide with a growing economy, which can drive increased consumer spending and business activity. This can lead to higher corporate earnings and improved financial performance for companies listed in the equity market, positively impacting equity market indices. Additionally, during periods of inflation, certain industries or companies may benefit from increased pricing power, allowing them to pass on higher costs to consumers through price adjustments. This can contribute to revenue growth and positively influence equity market performance. Moreover, inflation can incentivize investors to seek alternative investments to preserve the value of their assets. Equities, as an asset class that historically has the potential to outpace inflation, may become relatively more attractive, leading to increased demand and upward pressure on equity market indices.

H₀₄: Money supply has no significant effect on equity security market indices in Kenya. The results presented in Table 4.12 show that money supply has a significant negative effect on equity performance index ($\beta_4 = -1.51 \times 10^{-13}$ $p\text{-value} < 0.05$); hence, (H₀₁) was rejected. A one-unit increase in the money supply is associated with a decrease in the equity performance index by -1.51×10^{-13} units. When the money supply increases, it tends to have a negative impact on the equity performance index. This relationship suggests that higher money supply can potentially lead to decreased investor confidence and reduced investment in the equity market, resulting in lower equity performance. These results are in contradiction with another study that was done by Shaoping, (2008). A decrease in the money supply can indicate tighter monetary policy aimed at controlling inflation. This can lead to higher borrowing costs, reduced consumer spending, and decreased business investment, negatively impacting the financial performance of companies listed in the equity market. Additionally, a contraction in the money supply can result in reduced liquidity in the economy, making it more challenging for businesses to access funds for expansion or operational needs. This can constrain their growth prospects and ultimately affect equity market performance. Moreover, a decrease in the money supply can signal a period of economic uncertainty and decreased investor confidence. Investors may become more risk-averse and shift their investments away from equities, leading to a decline in demand for stocks and a potential decrease in equity market indices.

H₀₅: GDP has no significant effect on equity security market indices in Kenya. The results presented in Table 4.12 show that GDP has a significant positive effect on equity performance index ($\beta_5 = 1.10 \times 10^{-9}$ $p\text{-value} < 0.05$); hence, (H₀₁) was rejected. A one-unit increase in GDP is associated with an increase in the equity performance index by 1.10×10^{-9} units. When GDP increases, it tends to have a positive impact on the equity performance index. This relationship suggests that higher GDP can potentially lead to increased investor confidence, improved corporate earnings, and higher stock prices, positively influencing equity market performance.

These results were in agreement with another study that was done by Diebold and Yilmaz (2008). A growing GDP indicates an expanding economy with increased production, consumption, and business activity. This can lead to higher corporate earnings and improved financial performance for companies listed in the equity market, positively impacting equity market indices. As GDP expands, companies may experience revenue growth, increased profitability, and enhanced investor confidence, which can contribute to higher stock prices and overall equity market performance. Additionally, a growing GDP often implies a positive business environment, favorable market conditions, and increased investor sentiment, attracting both domestic and foreign investors to participate in the equity market. This influx of investment can drive demand for equities and lead to upward pressure on equity market indices. However, it's important to note that other factors, such as government policies, monetary conditions, market sentiment, and global economic trends, can also influence the relationship between GDP and equity market indices.

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5.0 RECOMMENDATION AND CONCLUSION

Based on the observed negative significant effect of the exchange rate on equity security market indices, a policy recommendation to mitigate any adverse impact on the equity market would be to focus on promoting stability in the exchange rate. This can be achieved through effective monetary and fiscal policies aimed at managing exchange rate fluctuations. Central banks can employ measures such as intervening in foreign exchange markets to stabilize the currency, implementing appropriate interest rate policies, and maintaining adequate foreign exchange reserves. Additionally, policymakers should work towards fostering a favorable investment climate by promoting economic stability, attracting foreign investment, and implementing structural reforms to enhance the competitiveness of domestic industries. This can help reduce the vulnerability of equity market indices to adverse exchange rate movements and create a conducive environment for the growth and development of the equity market. Monitoring and analyzing the impact of policy interventions on the relationship between the exchange rate and equity market indices will be crucial in ensuring the effectiveness of these measures.

Central bank and policymakers should aim to strike a delicate balance between controlling inflation and supporting economic growth. This can be achieved by closely monitoring economic indicators and adjusting interest rates accordingly. During periods of economic expansion, policymakers can consider gradually raising interest rates to prevent overheating and excessive risk-taking in the equity market. On the other hand, during economic downturns or periods of low growth, policymakers can adopt accommodative monetary policies by lowering interest rates to stimulate economic activity and encourage investment in the equity market. Additionally, it is essential to maintain clear and transparent communication about interest rate decisions to manage market expectations and minimize uncertainties. Regular assessment and monitoring of the impact of interest rate changes on equity market indices will be crucial in ensuring the effectiveness of these policies.

Additionally, central banks should prioritize price stability and monitor the growth of money supply to ensure it remains in line with the country's economic fundamentals. This can be achieved through effective implementation of monetary tools such as interest rate adjustments, reserve requirements, and open market operations. Additionally, policymakers should promote financial stability by monitoring and regulating the banking and financial sector to prevent excessive credit creation and speculative activities. Maintaining transparency and clear communication about monetary policy decisions can help manage market expectations and minimize uncertainties. Regular evaluation of the relationship between money supply and equity market indices will be crucial in assessing the effectiveness of the implemented policies and making any necessary adjustments.

Lastly, policy makers should prioritize policies that promote sustainable economic growth and support the development of robust and diversified industries. Governments should focus on implementing measures that foster a conducive business environment, encourage entrepreneurship, and attract domestic and foreign investment. This can involve providing incentives for innovation, improving infrastructure, enhancing access to financing for businesses, and reducing bureaucratic barriers. Additionally, policymakers should prioritize education and skills development to ensure a skilled workforce that can contribute to economic growth and attract investment in knowledge-intensive industries. Strengthening governance frameworks, enforcing regulations, and enhancing investor protection can also instill confidence in the equity market. Regular monitoring of GDP growth, market dynamics, and the relationship between GDP and equity market indices will be crucial in assessing the effectiveness of policies and making necessary adjustments to sustain the positive impact on the equity market.

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