

**THE INFLUENCE OF MACRO ECONOMIC FACTORS ON THE STOCK MARKET
PERFORMANCE IN KENYA.**

BY

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DECLARATION

I declare that this thesis is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and author duly acknowledged.

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Declaration by University Supervisor

This research project has been submitted for examination with my approval as

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ABSTRACT

The study sought to analyze the influence of macroeconomic factors on stock market performance in Kenya. The macroeconomic factors of interest in this study include interest rates, money supply, economic growth and net capital flow. The study was anchored on the Flow oriented theory, the monetarist model and the efficient market hypothesis. The study targets all the firms listed in the Nairobi Securities Exchange (NSE). The study used secondary data which was sourced from the Central Bank of Kenya (CBK) and Kenya National Bureau of Statistics (KNBS). Data was analyzed using STATA using time series methods. The characteristics of the data were determined using exploratory time series analysis. Trend analysis was also done on all the variables in order to ascertain the behavior across the time period. This was achieved through line plots. The appropriate time series model for the data was Autoregressive-Distributed Lag (ARDL). This was used to determine the relationship between macroeconomic variables and NSE performance. Post estimation tests were done to determine how the model used is effective in explaining the relationship between variables in the study. This was achieved using the Granger Causality test. Based on the study findings, the study concludes that the macroeconomic environment in the country over the study period have been changing greatly. There were huge variations in the interest rates, exchange rates, and BOP. Based on the granger causality test, the study concludes that interest rates granger cause NSE performance, hence, the interest changes can be used to forecast changes in the NSE performance. Changes in the interest rates is therefore a key factor used by investors in making investment decisions when buying stocks in the NSE. The granger causality test also found out that exchange rates granger causes the NSE performance. This implies that investors in the stock market can base their decision on the exchange rates. From ARDL model, there was a statistically significant relationship between exchange rates and NSE performance. Specifically, the study concludes that exchange rates significantly influence the NSE performance in that an increase in exchange rates leads to a decline in the NSE performance. This means that an increase in the exchange rates reduces foreign participation in the NSE. This is likely to lower the returns and hence a low NSE index. A stable currency is thus crucial as it helps to maintain market vibrancy as trading continues. When market volatility is high, the risks are high since it is hard for investors to approximate precisely the future direction of their investments. This discourages investment and hence low NSE index. Regarding the influence of net cash flow on the NSE performance, the study concludes that changes in the BOP influence the stock market performance. This implies that, when making decisions on whether to invest in the NSE, investors consider the net capital flow. The findings imply that an increase in the BOP causes the stock market returns to increase which indicates the listed companies get the capability to expand productions and increase sales. This leads to increased sectors earnings for firms which results in better dividend payments for firms leading to an increase in the stock market shares. Generally, the study concludes that interest rates, exchange rates, and BOP influence the NSE performance and can be used to predict the NSE performance. There was a strong and significant relationship between all the macroeconomic factors and the NSE performance. This implies that the macroeconomic environment in Kenya is a key determinant of business activities including the performance of equity markets.

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DEDICATION

This research project is dedicated to my family for their support, prayers and encouragement throughout my academic journey.

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ACCRONYMS AND ABBREVIATIONS

ARDL	Autoregressive-Distributed Lag model
ARIMA	Auto Regressive Integrated Moving Average
CAEX	Current Account to Export
CBK	Central Bank of Kenya
CDS	Central Depository System
CMA	Capital Market Authority
CPI	Consumer Price Indices
EGARCH	Exponential Generalized Autoregressive Conditional Heteroskedascity
EMH	Efficient Market Hypothesis
ERSWEC	Economic Recovery Strategy for Wealth and Employment Creation
IFC	International Finance Corporation
KNBS	Kenya National Bureau of Statistics
LSE	London Stock Exchange
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
OILP	Oil Price Index.
RER	Real Effective Exchange Rate
UK	United Kingdom

TERMS AND DEFINITIONS

Capital flow-The movement of money in and out of the country for the purpose of investment, trade, or business operations

Exchange rates-The value of a country's currency against the currency of nations of economic zones.

Interest rates-The charges paid when money is borrowed for a given duration

Macroeconomic variables- Factors that influence the general economy of a country

Stock market -A platform in which stocks and securities of different firms are traded

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stock markets offer a platform in which stocks and securities of different firms are traded. In the stock market, hundreds of stocks are traded on a daily basis. To determine and analyze the performance of stocks, investors, the investors observe the level of the various composite market indices. Here, a market index refers to a general value that is produced through a combination of the different stocks being traded and the total values are then expressed against a base value. The stock index is vital as it gives the historical performance of a stock market. It also offers a bench mark that helps in comparison against the performance of individual investors. The market indices can also help the investors to predict the future stock market trends.

The stock market is crucial both to the listed firms and the general economy. Stock markets are vital in that they offer an avenue where the listed firms can access long-term capital and offers the investors alternative investment avenues to venture into (Fufa & Kim, 2018). The stock exchange affects the general economy of a nation as stock prices fluctuations cause's changes in the total consumption in a country. Fluctuations in stock prices can also lead to changes in the financing cost available to firms. This shows the significance of stock markets to the economy of a country.

The stock market is sophisticated in nature. This is because, besides offering an avenue where traders trade in stocks, it is also a center to the creation and development of a strong and competitive economy (Masoud, 2014). Likewise, according to Yartey and Adjasi (2007), the stock market is a very vital financial sector component. Therefore, a well-streamlined and a

properly functioning stock market can help reducing the equity capital for companies and help investors in pricing and hedging risks effectively.

The significance of the stock market has been acknowledged in both developed as well as the developing economies. According to Prats and Sandoval (2016), the stock markets in the European nations are very developed and they are a key feature of the financial sectors in these countries. Using the data for the period 1995 to 2012, they established that stock markets contribute significantly to the economy as a result of stock market growth in Slovakia, Bulgaria, Czech Republic, Hungary, Poland, and Romania. In the United Kingdom, the stock market is among the leading economic contributors. The London Stock Exchange is among the most developed stock markets globally and it creates an avenue where trades deal in shares, stocks and other forms of capital. The stock market helps to mobilize the domestic savings and facilitate the reallocation of financial resources. It also enhances the flow of capital in and out of the country (Nyasha & Odhiambo, 2013).

The contribution of the stock markets is also notable in the Asian countries. Evidence gathered from four nations, China, India, Singapore, and Bangladesh shows that the stock markets in these nations are very advanced and they have noteworthy economic contribution (Azam et al, 2016). In all the countries, the well-built and developed stock markets make it easier for investors to circumvent risks when they capitalize on prospective projects. Additionally, the active stock markets perform a decisive role in investments assignment in various sectors which ultimately contributes to the economic welfare of the countries.

In Africa, while the stock markets are not as developed as it is the case with developed nations, their key roles cannot be ignored. Using evidence from South Africa and Nigeria, Osakwe and Ananwude (2017) identified that stock markets had huge economic contribution in

both nations. Osakwe and Ananwude (2017) documented that stock markets offers an avenue where scarce resources are pooled and this helps to promote the economies of the countries.

In the East African region, the stock markets continue registering growth and development and continue being a huge economic contributor. Evidence from Uganda shows that the stock market, although it is still not so much developed, has great economic contribution to the country. The stock has created an avenue for efficient allocation of resources which in turn spur economic growth and development (Tumwebaze, Orobias, & Kamukama, 2019). In Kenya, the stock market is highly developed, it is the most developed in East African and among the most developed in Africa. The Nairobi Stock Exchange, since its formation, has continued to develop including a surge in the increase in the stock brokers, investment banks, credit firms, custodian institutions, as well as a large number of listed firms (Cherono, Olweny, & Nasieku, 2019).

While the stock markets have been identified as key economic contributors, their performance is affected by numerous macroeconomic factors. Macroeconomic variables form a component of economics that focuses on the functioning of a given economy in general. It is the overall external environment that influences the behavior and performance of a given entity. These variables are vital to the entire economy either in an individual country or the world in general. These factors are used as the basis for evaluating the economic performance of a nation. These factors are vital as they determine the welfare of a given economy (World Bank, 2014).

1.1.1 Macroeconomic Variables and the Stock Market Performance

Macroeconomic variables have been defined differently. According to Evusa, Kitati and Maithya (2014), macroeconomic variables refer to factors that influence the general economy of a country. World bank (2012) defined macroeconomic variables as factors that are pertinent to the

broad economy at various levels that is national or regional levels. Some of macroeconomic factors include inflation, economic output, money supply, interest rates, among other factors. Macroeconomic factors impact on the firms and firms do not have control over them (Shah, Hiles, & Morley, 2018). While these factors are beyond the business entity, they greatly affect the operations of the firm.

The stock market performance highly depends on macroeconomic variables. The economic growth, for instance, is considered among the major factors that greatly impact the stock markets (Singh, 2014). This is because, when the economic conditions are favorable, there are high trading activities, including investment activities. In this period, stocks are greatly traded and yielding huge returns. On the other hand, poor economic conditions negatively affect the stock market performance, leads to high volatility in market returns, and reduced trading of stocks in the economy (Singh, 2014).

Another factor that impacts on the stock markets is fluctuations in exchange rates (Hajilee & Al Nasser, 2014). The change in the exchange rate can occur due to volatility in other macroeconomic factors. The uncertainty in exchange rates can also occur due to the liberalization of capital flows. Depreciation in exchange rates leads to reduced activities in the stock markets. On the other hand, appreciation in exchange rates increases the activities in the stock markets which in turn translates to good performance.

Interest rates also impact stock market performance (Ahmed & Zlate, 2014). According to Ali (2014), interest rates are charges borrowers pay to lenders to use the lenders' funds for a given duration. Interest rates are measured by the average lending rates by commercial banks. They are rarely static, and they often fluctuate depending on the changes in the microenvironment. Interest rates changes cause variations in the stock markets in a way that

high-interest rates discourage borrowing, which in turn decreases investment. Low rates, on the other lead to increased borrowing and increased investment in the stock markets.

Exchange rates is another factor that influence the stock market performance. Exchange rates simply refers to the degree in which a country's currency is traded against the currency of another country (Engel & West, 2005). Changes in the exchange rates occur as a result of changes in other factors in the macro economy. The variations in the exchange rates are also caused by capital flows liberalization. The changes in the exchange rates in turn impacts on the performance of the stock market. This is because, the variations in the exchange rates causes changes in a company's operations, cash flows and the value of its stocks.

1.1.2 Stock Market in Kenya

The stock market activities started in the 1920s dealing with stocks and shares. During that period, the market was not formally regulated and all the trading activities did not occur under any formal rules. During this period, the trading activities were done under informal agreements whereby (Aduda, Masila, & Onsongo, 2012). In 1995, the stock market in Kenya registered notable improvements after the stock market liberation (NSE, 2018). Between 1990 and 2012, there was a huge increase in turnover whereby by 2010, it reached Ksh.110.3 billion. In 2012, according to the Economic Survey (GOK, 2013), the performance of the stock market improved greatly, whereby the NSE 20 Share Index recorded an increase of 29% to 4,133 as compared to the 3,205 obtained by the end of recorded by the end of 2011. At the time, there was a significant increase in market capitalization from Ksh.868 billion recorded in 2011 to Ksh. 1,272 billion by the end of 2012.

In Kenya, the stock market activities are conducted in The Nairobi Securities Exchange (NSE). NSE is among the highly growing and developing in the Sub-Saharan region. From the

time it was established in 1954, NSE has been able to list both equity and debt securities (Olweny & Omondi, 2011). It gives a platform to both local and international firms that seeks to get exposed to the economic growth in Kenya in Africa in general. In terms of trading volumes, the NSE is Africa's fourth largest stock exchange (CMA Bulletin, 2009). By December 2009, the 56 listed 28 companies had a total market capitalization of approximately Kshs 831 billion, (NSE Bulletin, 2009). Bonds and commercial papers are other securities listed at NSE.

Dealing in stocks and shares in Kenya is a gradual process that began in the 1920s, when Kenya was still a British colony. NSE has grown over the years to play an important role in the economy of Kenya before and after independence, after being recognized as an overseas stock exchange by the London Stock Exchange (LSE) in 1954. By 1966, the NSE had started computing the NSE Index, a weighted average of price changes in a number of stocks, to monitor regular trading activity. The year 1966 was used as the starting point, with a score of 100.

The major stakeholders in the history of NSE are GOK, CBK, CMA, and NSE itself, who have come up with several initiatives aimed at enhancing the bourse's growth over the years, either individually or in collaboration, including legislation at various stages of the bourse's existence aimed at strengthening and improving its efficiency. The abolition of the entire Exchange Control Act in 1995, as well as changes to restrictions on foreign ownership of local companies and the implementation of a favorable tax system on dividend income (NSE Handbook), is intended to promote foreign portfolio investments and increased local involvement in the NSE. The CMA Act of 1989 and the Central Depository System (CDS) Act of 2002, as well as the publication of various policies and guidelines, have all played a role in improving the exchange's efficiency.

GOK Policy reforms allowed the CBK to conduct a study titled "Development of Money and Capital Markets in Kenya" in 1984 in collaboration with the International Finance Corporation (IFC), which became a blueprint for structural reforms in Kenya's financial markets and led to the establishment of the CMA in 1989 - a regulatory body tasked with assisting in the creation of an environment conducive to business.

The NSE underwent institutional reforms in 1991, when it was registered under the Companies Act, after which it embarked on an ambitious modernization program, which included a relocation to more spacious premises at the Nation Centre in July 1994, along with a new Information Centre. Workflows were computerized, and in 2006, the Electronic Trading System was implemented in response to growing trading volumes. Trading can be done from the brokers' offices thanks to a Wide Area Network platform that was launched in 2007.

The NSE is poised to play an increasingly important role in the Kenyan economy, especially in the privatization of state-owned enterprises. Under the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) 2003-2007, the Government implemented a number of key privatization transactions through the NSE. Kenya's new development blueprint - Kenya Vision 2030 aims to transform Kenya into a newly industrializing, "middle-income country" by the year 2030 and targets macro-economic goals such as raising the savings rates from 17% to 30% of GDP and increasing the stock market capitalization from 50% to 90% of GDP (Ministry of State for Planning National Development and Vision 2030). This is also hoped to improve performance of the NSE.

Currently, the NSE has four indices that are utilized to measure stocks' performance. One of these measures is the NSE All Share Index which captures all the listed firms. Another measure is the Financial Times Stock Exchange which captures the largest 15 stocks trading on

the NSE. Another index used in the NSE is the FTSE NSE Kenya 25 which captures the 25 firms listed in the NSE with the most liquid stocks. Another index used in the NSE is the NSE 20 Share Index. This measure captures the 20 blue-chip companies' through market capitalization, shares traded, number of deals, and turnover (Karanja, 2012).

1.2 Statement of the Problem

The NSE has emerged as one of the highly growing markets in Eastern and Central African nations and it has significant economic benefits to the country (Capital Markets Authority, 2012). However, in the recent past, the NSE has experienced great changes. Secondary trading activities have increased from Kshs. 432 billion in 2016 to Kshs. 435 billion in 2017. The NSE 20 gained a 17% increase from 2016 to 2017. The NSE All Share Index (NASI) increased by 28% between 2016 and 2017. Since August 2019, the Nairobi Stock Index has recorded a decline of up to 5% which indicates a slowdown in the Kenya' capital market. Since the beginning of 2020, the NSE performance has declined greatly and has recorded a decrease of about 27.15%.

The macroeconomic environment has recorded numerous changes in the recent past. According to the recent publication by the Kenya National Bureau of Statistics on Consumer Price Indices (CPI) and Inflation Rates, by December 2019, the year-to-year inflation stood at 5.82 % (Capital Markets Authority, 2019). The available statistics shows that in the whole year 2019, the inflation rates remained high and had increased considerably from 3.83% in September to 5.82 in December. Regarding the interest rates, the interest rates had a declining trend through 2019 showing a huge decline from 7.51 in the third quarter of 2018 to 6.31 in the third quarter of 2019 (Capital Markets Authority, 2019). Regarding the exchange rates, the exchange rates have been recording high volatility since liberalization in October 1993 (Maana, 2013).

Huge exchange rate volatility was also experienced between 2007 and 2014. It is worth noting that such variation in exchange rates leads to an increase in market risks which would in turn impact on the performance of a firm. Since 2014, there have been considerable changes in the macroeconomic environment in the country and therefore there is need for another study to capture the recent changes in the macroeconomic variables. In this regard, there was need for a study that captures the current and recent macroeconomic changes as well as the changes in the stock market performance. The purpose of this study therefore is to determine whether the decline in the stock market performance recorded in the recent past is partly attributed to changes in the macroeconomic variables in the country.

Although various studies have been done on how the macroeconomic environment in country affects the economic activities, there is still unclear research on the stock market as only a few studies have focused on this area. Among the few studies done, Ouma and Muriu (2014) established that money supply, exchange rates, and inflation impact on the stock market returns in Kenya. Although this study was informative and offered key insights on the role of macroeconomic factors on the stocks, it did not capture the recent changes in the macroeconomic factors since the study period was 2003- 2013. Since 2012, there have been considerable changes in the macroeconomic environment in the country and therefore there is need for another study capturing these changes. In this regard, there was need for a study that captures the current and recent macroeconomic changes.

In another study, Ndegwa (2015) analysed how macroeconomic environment determine the stock market returns in Kenya and established that exchange rates and money supply affected the stock market returns. While this study was crucial and offered insights, it only focused on two macroeconomic factors, and hence the findings were not conclusive. There was, therefore, a

need for this study in order to get better insights. From the available literature, there is a knowledge and empirical literature gap and hence the need for this study. It is expected that the findings in this study will go a long way into shaping policies, guiding investors when making investment decisions and contributing to the available literature on macroeconomic variables and the effects on the stock market performance.

1.3 Research Objectives

1.3.1 General Objective

The overall goal of this study was to analyze how macroeconomic factors influence the stock market performance in Kenya.

1.3.2 Specific Objective

- i. To determine the influence of interest rates on stock market performance in Kenya.
- ii. To analyze the influence of exchange rates on stock market performance in Kenya.
- iii. To assess the influence of net capital flow on stock market performance in Kenya.

1.4 Research Questions

- i). How do interest rates influence the stock market performance in Kenya?
- ii). What is the effect of exchange rates on stock market performance in Kenya?
- iii). How does net capital flows influence stock market performance in Kenya?

1.5 Significance of the Study

The study is vital in different ways. It will have both policy contribution and academic and scholarly contribution.

1.5.1 The Investors

The study will offer key insights on the effects of macroeconomic factors on stock market performance. The study will benefit investors as they will be better informed on how different

macroeconomic variables influence stock market performance. This way, the investors will get good background information on how various macroeconomic factors can impact on their investments. This guides in making investment decisions. In this study, the study will offer key insights on how changes in interest rates, exchange rates, and balance of payment cause variability in the stock market performance. It is worth noting that changes in macroeconomic variables increases uncertainty in the market. When the macro economic environment is favorable, the investors' confidence is boosted which in turn increases investment in the stock market. On the other hand, unfavorable macroeconomic environment in the country discourages investment in the stock market which in turn lowers the stock market performance. This implies that investors will highly rely on the findings of this study to diversify risks while investing in the stock market.

1.5.2 Policy Making

The study will help to shape policies on macroeconomic variables and stock market performance. In this regard, the study will be useful to the Capital Markets Authority and the Nairobi Securities Exchange as it will guide them in formulating and implementing different policies related to stock pricing as well as regulating trading activities at the NSE. Further, the study will offer the government key insights on how macroeconomic variables impact on the stock market performance and hence help in shaping policies.

1.5.3 Academicians and Researchers

The study offers key insights on macroeconomic variables and their effects on the stock market performance in Kenya. The study will have great contribution to literature and theory on macroeconomic variables and how they influence the NSE performance. In this regard, this study will benefit other researchers and academicians. The study will be a key reference point for other researchers and academicians with interest in the same area and other related areas. Also the

study will research gaps that other researchers can focus. For instance, since this study only focused on the interest rates, exchange rates, and net capital flows and how these influence NSE performance, further studies can be done focusing on other macroeconomic variables such as inflation, and GDP on the stock market performance.

1.6 Scope of the Study

The study sought to determine how macroeconomic factors influence the stock market performance in Kenya, focusing on the firms listed on the NSE. The macroeconomic factors that were covered include interest rates, Exchange rates and Net capital flow. The study period covered the period between 1990 and 2019 in quarterly basis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two covers literature review whereby it analyses various studies conducted by other researchers. The chapter presents a theoretical framework, discussing the relevant theories that will inform the study, the empirical literature review where it focuses on relevant research studies that have been done previously by various researchers, and the conceptualization of the study variables.

2.2 Theoretical Framework

The study was informed by Flow-oriented theory, Monetarist model and Efficient Market Hypothesis (EMH). These theories explain the effect of various macroeconomic variables on the stock market performance.

2.2.1 Flow-Oriented Theory

Flow oriented theory was developed by Dornbusch and Fisher (1980). The theory argues that changes in exchange rates changes the competitiveness of the firm in the global market as well as the balance of trade position. The exchange rates therefore impact on the real income and output in a nation. According to this theory, the share prices of a firm are determined by changes in the exchange rates as well as the future cash flows of companies (Dornbusch & Fisher, 1980).

The flow-oriented theory maintains that changes in exchange rates impact on the firm's competitiveness due to its effect on input and output prices (Sui & Sun, 2016). This therefore implies that appreciation in exchange rates negatively affects exports. In the same regard if the currency of a country appreciates, the value of the goods and services in the international markets goes low. This as a result leads to a decline in the value of exports as they will appear excessive to buyers in the international market. This implies that the goods lose competitiveness

in the international market. Consequently, their profits go down which will in turn lower the competitiveness of the firm in the domestic stock market (Sui & Sun, 2016). The low attractiveness of the firm on the domestic stock market leads to low value in the company's stock prices.

This model is relevant and applicable in this study as it related the macroeconomic variables on the performance of a firm as well as the attractiveness of the firm on the stock market. In this study, the theory helps to determine how exchange rates variations affects the stocks of the companies listed on the NSE.

2.2.2 The Monetarist Model

The Monetarist model was originated by Friedman (1940). The monetarist model is an economic concept which argues that money supply changes are the most significant determinants of the economic growth rate and the business cycle behaviors. According to the monetarist model, an increase in a country's money supply enhances economic engagements and the reverse holds. The theory argues that in most cases, real output fluctuations occur due to changes in the money supply rather than changes in the consumption or investment spending.

According to this theory increasing money supply, causes inflation and prices to increase while decreasing money supply causes deflation and risks, causing a recession. Changes in money supply also affects the production levels, and employment but the monetarist theory argues that the effects are only short term while the effects on inflation is long-lasting and significant (Wright, 2018).

The monetarist model application in economic is premised on the amount of money circulating in the economy which includes bank balances, coins and bills (Isaic, Smirna, & Paun, 2019). The fundamental argument of the theory is that the size of money supply is more

important than other factors in the economy. In the 1970s, governments were guided by the Keynesian economics school of thought, which was dominant during those eras, to curb economic stagnation and inflation. According to the proponents of the theory, the Keynesian model had shortcomings as it argued that inflation could only be suppressed by restraining money supply.

The development of the Monetarist theory was as a reaction to Keynesian theory (Tily, 2016). Keynes provided a blueprint for recovery from the Great Depression that impacted significantly on the world economy in the 1930s and guided the governments on how to revive their economies by reducing taxes and increasing money supply. The money utilized to fund project projects and to help the poor and the underprivileged people for example would lead to an increase in disposable income which in turn increase their ability to purchase goods and services. A surge in demand for the goods and services would be a key incentive to firms to expand their production capacities. This policy was pursued by many countries during the recovery from e great depression (Tily, 2016).

The suitability of the model in the current study is based on the premise that it provides key insights on how the stock market reacts to changes in the country's money supply. The theory argues that an increase in the money increases the money in circulation which implies there is sufficient money for investment including investment in the stock market. The performance of the stock market improves in result. On the contrary, a decrease in money supply leads to low money in circulation which in turn reduces the money available for investment including investment in the stock market.

2.2.3 The Efficient Market Hypothesis (EMH)

This theory was created by Eugene Fama (1970) and hold that in an efficient market, the stock prices reflect all the information the market receives at all the times. According to Fama, it is impossible for a firm to make profit by studying the different factors that can cause changes in stock prices. As per the EMH model, there will be instant changes in the stock prices which reflects any new information that is received by the market (Malkiel, 2003). Going by the conclusions of this theory, any form of data analysis on the macroeconomic factors would not be useful due to lack of stock prices prediction currently and in the future. If the conclusions of the EMH are upheld, this study will be invalidated as the focus on the macroeconomic variables.

EMH proposes different types of information. The lowest level of efficient market is the weak form whereby; all past information is reflected in the stock prices which makes it useless to conduct technical analysis. The other efficient market level is the semi strong form whereby stock prices changes rapidly and swiftly to incorporate all information in the weak form and all publicly available information. As a result, there is no need of analysis of the firm's specific factors, industry factors, and other economic factors. The other highest form of the efficient market is the strong form whereby all the information in the semi strong form and the information considered as secret by firm is reflected in the share prices (Malkiel, 2003). According to all the three efficient market forms, it is useless to forecast the stock prices based on the analysis of information.

The EMH is relevant and applicable in this study. Therefore, the model is used to determine whether it is possible to predict the future stock market performance through the analysis of the macroeconomic factors.

2.3 Empirical Review

Macroeconomic variables are variables that are critical for the entire economy of a country or the world as a whole (Romer, 2012). These factors have an effect on the whole population, not just a few individuals. Gross domestic product (GDP), interest rates, inflation, rate of trade, government intervention, and natural disasters are among the variables. They are of interest to a wide range of stakeholders, including company owners, customers, government agencies, and commercial and service companies.

2.3.1 Interest Rate and Stock Market Performance

Interest rates refers to the charges paid when money is borrowed for a given duration (Ali, 2014). Interest rates are not constant, and they often fluctuate in response to changes in the macroeconomic climate. Interest rates, according to Sill (1996), are influenced by events in the foreign and domestic markets, as well as national economic prospects and inflation. The nominal interest rate, according to Fisher (1930), is a mixture of the actual interest rate and inflation. When inflation rises, so does the cost of living.

The impact of interest rates on NSE has been researched widely. Talla (2013) conducted a study determine how macroeconomic factors influence the Stockholm Stock Exchange. The data for this period covered the period 1993 to 2012. The data was analyzed using Granger causality test, unit root test and multivariate regression method. From the analysis, the study established the stock prices were highly affected by changes in interest rates.

Zoa (2014) analyzed the macroeconomic variables and the influence the reaction of the Japanese stock market to the macroeconomic factors. Based analysis, the study identified that the macroeconomic environment had significant effect on the stock market performance. In another study, Eldomiaty et al (2019) analysed the sensitivity of stock market performance on the

macroeconomic variables among firms listed in DJIA30 and NASDAQ100 and established that the stock market performance was highly sensitive to changes in the macroeconomic environment in the country. In another study, Omodero and Mlangi (2019) identified that the Nigerian stock market was highly affected by the interest rates. Similarly, Addo and Sunzuoye (2013) identified that the Ghanaian stock market was highly sensitive to the macroeconomic environment in the country, more specifically changes in interest rates and treasury bills.

Barakat et al. (2016) conducted a study to determine the how the stock amrkets in Egypt and Tunisia are affected by changes in the macroeconomic environment and established that variability in the stock market was as highly influenced by the changes in the prevailing macroeconomic environment in the countries. Similarly, Kganyago and Gumbo (2015) analyzed sensitivity of the Zimbabwean stock market on the money market interest rates for the period 2009 to 2013 and identified that the changes recorded in the stock market were mainly due to variability in macroeconomic factors in the country.

Locally, Olweny and Omondi (2011) analysed the macroeconomic determinants of NSE performance and found out that interest rate had an impact on stock market returns. Similarly, Wanjiku (2014) conducted a study to determine how the industry returns of Pension Funds in Kenya changes with changes in the macroeconomic environment in the country and concluded that interest rates had negative influence on the industry returns.

Laichena and Obwogi (2015) analysed the different macroeconomic factors and how they influence the stock market returns in Kenya. Secondary data was used covering the period 2005 to 2014 which was analysed using regression analysis. The study established that the NSE was highly sensitive to changes in the interest rates. This implies that when interest rates increase, they discourage borrowing which also limits investment in stocks. On the contrary, a reduction in

interest rates encourages borrowing which consequently increase investment in the stock market. In a similar study, Ochieng et al. (2012) identified that the NSE performance was highly affected by changes in inflation rates, interest rates, and treasury bills and therefore, investors highly observed changes in these variables when making investment decisions.

Chirchir (2012) examined the reaction of NSE performance to changes in the interest rates for the period between 2002 and 2004 and identified that changes in the NSE were highly affected by changes in the interest rates. This is because, favorable rates encourage high borrowing and consequent investment in different sectors including investment in the stocks of the listed firms. On the other hand, high rates discourage borrowing and limits investment in stock market and other sectors in the country.

Muriuki (2014) conducted a study on to determine how NSE reacts to changes in the macroeconomic environment in the country. Based on the analysis, it emerged that market liquidity had weak positive effect on the relationship market returns. This would be taken to mean that when market liquidity increases, there is resultant increase in the stock market investment which leads to higher returns. With regard to inflation, it emerged that an increase in inflation negatively impacted on the market returns.

Siriba (2016) did a study to find out how NSE reacts to changes in the interest rates. The analysis results indicated changes in the macroeconomic variables chosen, with the exception of inflation, had no major effect on stock market results, and that changes in TB rates had only a slight impact on the returns from the stock market. Furthermore, it was observed that changes in TB did not lead to changes in stock market performance. The study's findings show that the Federal Reserve's expansionary monetary policy is working. Similarly, Otieno, Ngugi, and Wawire (2017) in a study on the sensitivity of NSE performance on changes in the interest rates

established that high interest rates limit investment in the stocks of the listed companies while low rates increased investment in the stocks which in turn led to high returns.

Rachael and Moses (2017) conducted a study to determine how interest rates impact the NSE returns for the period between, 2012 and 2016, focusing on how the market returns changes with changes in interest rates regulation. The data was analyzed using the mean, standard deviations and regression analysis. Based on the results, a conclusion was made that changes in the interest rates negatively impacted the stock market performance. This implies that when the rates are high, there is low borrowing and investment in the stocks of the listed firms which in turn leads to low market returns. On the other hand, low rates increases investment in the stock market which in turn leads to high market returns.

2.3.2 Exchange Rates and Stock Market Performance

The influence of exchange rate movements has become a key concern among policy makers and researchers across the globe. For a number of purposes, economists are concerned about the inter-temporal nexus between the stock market returns and the exchange rates. The growth of a country's economy Increases in global trade and capital continue to rise. Exchange rates have become a significant determinant of company profitability due to their fluctuation as well as stock values (Kim, 2003). The exchange rate impacts the prices of inputs and outputs which in turn impact on the firms' value as well as their competitiveness in the global markets (Joseph, 2012). As a result, recognizing this partnership would aid local and international investors in hedging and diversifying their portfolios.

Extensive research has been conducted on the influence of exchange rates on NSE performance. For instance, in a study conducted by Patra and Poshakwale (2012) on the Greece stock market performance for the period between 2001 to 2011, the findings showed that

exchange rate among other variables highly impacted the value of the stocks of the listed firms as well as the market returns. This was interpreted to mean that an increase in exchange rates discouraged investment in the stocks of listed firms which in turn lead to low market returns.

Perera (2016), the findings indicated that exchange rate movements had an impact on ASPI return volatility. In another study, Joseph (2012) studied the effect of foreign exchange and interest rate changes on 231 UK firms in the chemical, electrical, engineering and pharmaceutical industries for the period of 1988 to 2000. For the years 1988 to 2000, the study looked at the effect of foreign exchange and interest rate shifts on 231 UK chemical, electrical, engineering, and pharmaceutical firms. The study used two separate foreign exchange rate indexes, as well as a measure of interest rate adjustments. Increases in the interest rate had a greater negative impact on sector performance than foreign exchange rate changes. Interest rate and foreign exchange rate increases had more negative effects in the electrical and engineering industries, while they had more positive effects in the pharmaceutical field. Additionally, the results at the portfolio-level were generally similar with those based on the firm-level analysis, except that the short-term foreign exchange rate impact was very weak at the portfolio level.

Rashid and Karachi (2016) conducted a study on the relationship between interest rates and stock market returns. The study established that an increase in the real interest rate decreases the present value of a firm's potential cash flows, causing stock prices to fall. However, a higher interest rate encourages capital inflows, causing the exchange rate to fall. In this regard, a positive relationship between the average level of stock prices and exchange rates may be due to a real interest rate disturbance. As a result, the APT model assumes that macroeconomic factors like the exchange rate will influence the stock market.

Tiryaki, Erdoğan and Ceylan (2017) conducted a study to determine the relationship between stock returns and changes in macroeconomic factors in Turkey for the period 2003 to 2016. The study applied Engle-Granger causality and ARDL tests to determine the relationship between macroeconomic factors and stock market returns. The independent variables comprised of Industrial production index (IPI), Balance of Payment as measured by the current account balance to export, inflation as measured by CPI, exchange rates, interest rate, and the world oil price index. The study used monthly data obtained from financial statements of the firms and the central bureau of statistics. Based on the findings, the main determinants of stock returns included IPI, CPI, real effective exchange rate (RER), current account to export ratio (CAEX) and World Oil Price Index (OILP).

Iqbal and Haider (2015) conducted a study on the influence of changes in fundamental economic and financial variables such as interest rates, real business activity, inflation, exchange rate, and other variables on the stock market returns. The study established a relationship between exchange rates and the stock market performance. The existence and scale of the interdependence between exchange rates and stock prices has repercussions for international finance, and the issue of whether security markets price exchange rate risk is important. With the significant increase in cross border equity investments, the risk-reward trade-off of international diversification and management of multi-currency equity portfolios is of concern.

Sekmen (2011) conducted a study to determine how exchange rate fluctuations impact the stock returns in the US for the period 1980 to 2008. The ARIMA model was used to calculate volatility estimates. The federal funds rate was also used in the study to investigate how the stock market reacts to changes in the monetary policies in the country. Based on the analysis, the study found that changes in exchange rates had a negative impact on US stock returns because hedging

instruments were unable to mitigate the negative impact of exchange rate volatility on trade amount. Also, there was a significant relationship between the stock returns, monetary policy; and that federal funds rate, unanticipated inflation and current expected inflation rate.

Muhamad and Rasheed (2011) studied the relationship between stock prices and exchange rates in South Asian countries from 1994 to 2000, including Pakistan, India, Bangladesh, and Sri Lanka. The study utilized co-integration, vector error correction modeling, and standard Granger causality tests to determine the long-run and short-run relationship between stock prices and exchange rates. For all four nations, the analysis found no short-run relationship between the variables. In Pakistan and India, there was no long-term relationship between stock prices and exchange rates. However, there seemed to be bidirectional causality in Bangladesh and Sri Lanka.

Baharom, Habibullah, and Royfaizal (2008) conducted a study on the causal relationships between exchange rates and stock prices in Malaysia for the period 1988 to 2006. The research period was divided into two sample periods for the analysis. The first is the pre-crisis period, which began in January 1988 and ended in June 1997, the second was the post-crisis period, which began in July 1998 and ended in December 2006. The co-integration approach of Johansen (1991) was used both before and after the crisis. The study discovered that exchange rates had only short-term relationships and no long-term relationships.

Aydemir and Demirhan (2009) conducted a study to determine the causal relationship between stock prices and exchange rates for the period February 2001 to January 2008. Based on the findings, the study found out that there was a bidirectional causal relationship between the exchange rate and all stock market indices. In another study, Olugbenga (2012) investigated the relationship between exchange rate vitality and stock market conduct focusing on the Nigerian

stock market. Based on the findings, the study established a significant positive relationship between stock market performance and exchange rate in the short run and a significant negative stock market performance to exchange rate in the long run. The Granger causality test was also applied and the test result showed a strong evidence that the causation runs from exchange rate to stock market performance; implying that fluctuations in the Nigerian stock market index is explained by exchange rate volatility.

Adjasi (2008) conducted a study to determine whether exchange rate fluctuations have an effect on the Ghanaian stock market. The relationship between exchange rate volatility and stock market volatility was established using the Exponential Generalized Autoregressive Conditional Heteroskedascity (EGARCH) model. It was discovered that exchange rate volatility and stock market volatility have a negative relationship. In the long run, performance depreciation in the local currency increased stock market performance but, in the short run, it decreased the stock market performance.

Dimitrova (2015) investigated whether there is a correlation between the stock market and exchange rates that could explain market volatility. The study focused on the United States and the United Kingdom over the period January 2000 through August 2014. In the short term, he concluded, an upward trend in Currency depreciation can be induced by the stock market, whereas currency depreciation can be caused by a weak currency. He used a multivariate, open-economy model to evaluate these claims. Short-run model that allows for simultaneous products, money, and foreign exchange equilibrium. The study concluded that a depreciation of the currency may depress the stock market and the stock market will react with a less than one percent decline to a one percent depreciation of the exchange rate. This also implies that an appreciating exchange rate boosts the stock market.

Kitatia, Zablonb, and Maithyac (2015) examined the efficiency of NSE-listed firms in relation to macroeconomic variables. The study covered a five-year period from 2008 to 2012. The data was collected on a monthly basis. Stock prices were the dependent variable, while the independent variables were the rate of foreign exchange, interest rate, and the degree of inflation on share prices. The study used secondary data from the CBK and KNBS and analyzed using multiple regression analysis. Based on the analysis, the study established that changes in the exchange rate and other macroeconomic factors affected NSE stock prices.

Ndunda (2016) conducted a study on the impact of macroeconomic variables on the performance of equity market firms listed on the Nairobi Stock Exchange (NSE) for the period 2004 to 2015. The macroeconomic variables studied included exchange rate, inflation rate, money supply, and real GDP. Data was collected from the NSE, CBK, KNBS, and the International Monetary Fund website. The degree to which the stock market performance changed as a result of a unit difference in each of the dependent variables was estimated using a multiple regression analysis. The study indicated that exchange rate and other macroeconomic variables has statistically significant impact on the stock market returns.

Muinde (2017) conducted a study to determine the effect of macroeconomic variable changes on the share prices at the NSE. The macroeconomic variables in this study included inflation, exchange rate, money supply, credit spread, lending rates, and Treasury bill rates. The study used data gathered from diverse sources including the Central Bank of Kenya website, Kenya National Bureau of Statistics Website and the individual companies' websites. The study used applied the Johansen co-integration methodology to analyze the data. Based on the findings, the study established that a negative equilibrium relationship between money supply and share prices and a positive relationship between exchange rates and interest level in the long-duration.

In another study conducted in Zambia by Sichoongwe (2016), the study concluded that exchange rates volatility had negative effect on stock market performance for the period 2000 to 2015. This study is vital as it offer key insights on the role of exchange rates volatility on stock market performance and creates an opening for this study and other related studies.

Rabai and Khakan (2016) conducted a study on the relationship between exchange rate and stock market volatility in India Stock Market for the period between 2008 and 2010. Based on the analysis, the study concluded that exchange rate movement had negative influence on the Indian stock market. The study observed that the causality between There is a unidirectional causality between the two. In another study conducted in Nigeria by Diala, Kalu, and Igwe (2016) for the 2000 and 2010, the findings indicated that exchange rate movement had insignificant effect on the stock market. Insignificant relationship between the two variables of study.

Locally, Mugambi and Koech (2016) conducted a study on the effect of exchange rate and other macroeconomic variables on the stock market performance of the listed banks in the NSE. The study was conducted for the period between 2000 to 2015 on a quarterly basis. The study concluded that there was insignificant relationship between exchange rates and stock market performance.

In another related study, Nyongesa and Muchoki (2016) analyzed the relationship between exchange rate and NSE performance and concluded that there was a weak relationship between exchange rate movements and stock market performance in Kenya.

Ouma and Muriu (2014) conducted a study to determine the effect of macroeconomic variables on stock returns in Kenya for the period 2003 to 2013. The data was collected from different secondary sources. The study used Ordinary Least Square (OLS) to determine the

impact of macroeconomic variables on stock returns. Based on the analysis, the study established a statistically significant relationship between macroeconomic variables and stock returns. The study concluded that there was a significant effect on the stock market returns in Kenya attributed to the money supply, exchange rate and inflation rate. The exchange rate was however found to have a negative influence on the stock market return for the period of the study.

Musa (2014) conducted a study on the relationship between exchange rate volatility and stock market performance in Kenya using a sample of 55 companies for the 2009 and 2013. The study used multiple linear regression analysis to analyze data. Based on the analysis, the study concluded that there was an inverse relationship between exchange rate movements and the stock market performance in the study period.

Makori (2017) did a study to determine how the NSE performance is influenced by exchange rates variability. The exchange rates keep on fluctuating randomly and in this study the purpose was to determine whether this volatility affects trading activities and the NSE as well as the market returns. The study targeted all the listed firms, which is a census of all the 65 firms was conducted in the period between 2006 and 2016. The data utilized was sourced from the CBK, including regular stock market prices sourced from the NSE 20 share index and then averaged to monthly data, monthly exchange rate, inflation rate, interest rate, and money supply. The data collected was analyzed using the Dickey Fuller Test to determine stationarity. The nexus between the variables was determined using the Granger causality. Based on the analysis, there was a strong negative relationship between the exchange rates and the NSE market returns. The negative relationship indicated that an increase in the exchange rates discouraged investors from buying stocks of the listed firms due to weakening of the currency. The investors would reap less returns due to the weakened value of money and hence low investment.

Besides the exchange rates, other variables such as inflation and interest rates were analyzed. Concerning the interest rates, there was an inverse association between the NSE outcomes and interest rates. This implied that when the interest rates are high, there is less borrowing and less investment in the stocks of the listed firms. On the contrary, low rates would increase borrowing and investment in the stock market and other sectors in the country. Concerning inflation, there was a negative relationship between inflation rate and stock returns. This implies that when inflation is high, the value of money deteriorates which in turn discourages investment in the NSE and other sectors in the economy.

Mwangi (2017) did a study to determine how NSE reacts to changes in the exchange rates in Kenya. It is worth noting that exchange rates are not static and highly fluctuate which makes them highly uncertain. The trading activities at the NSE are based on this uncertainty which implies that the market returns also relies on the changes in the exchange rates. In this study, the aim was to determine how changes in the exchange rate of Ksh against USD for a 5-year period, 2012 to 2016 impact on the stock market. The study used descriptive analysis and inferential analysis methods to analyze the data.

Based on the findings, over the 60-month period from January 2012 to December 2016, foreign exchange movement was on average erratic. The largest percentage change was 4.34 percent in May 2012, followed by 3.94 percent in July 2015. The largest drop was -3.32 percent in October 2015, with the time between November 2015 and December 2016 stabilizing at 0.31 percent and 0.03 percent, respectively. The All-Share Index, which measures the success of the NSE, showed a downward trend from January 2012 to December 2016. A similar declining trend was recorded in the performance of the Nairobi Securities Exchange across the period January 2012 to December 2016, as indicated by the percentage change in the NSE 20 Share Index as

was with the All-Share Index. Pearson's partial correlation and regression analyses showed a poor and negative relationship between exchange rates and the performance of the Nairobi Stock Exchange, as calculated by the NSE 20 share index and the NSE All Share Index.

Nyaga (2014) did a study to examine operating foreign exchange exposure affect stock prices at the NSE. The research was carried out using an event study approach, which looked at how the stock price reacted to the event (exchange rate movement). Data for this study spanned the period between 2009 to 2013. Using correlation analysis, the study found out that exchange rates among other variables were strongly correlated with stock prices for all the listed firms. With regard to exchange rates, there was an inverse relationship between the exchange rate changes and stock market returns which implies that when exchange rates are high, it indicates weakness in the local currency and reduced value for money. Investors would thus be discouraged from investing in the stocks of the listed firms. On the other hand, low rates indicate strength in the local currency, high value for money which would then lead to high investment the stock market and other sectors in the economy.

Mbithi (2013) the nexus between the NSE performance and the foreign exchange rates for the period between 2002 and 2012 focusing on all the listed companies. Based on the analysis, the study found out that all the NSE's listed firms were exposed to exchange rate risk. According to the study's results, most Nairobi Stock Exchange listed companies are substantially exposed to foreign exchange risk arising from all major international trade currencies. Foreign exchange fluctuations affect companies' financial performance via imports, exports, accounts payables and receivables, and thus have an effect on their net income and balance sheet through equity reserves, according to the study.

Sifunjo and Mwasaru (2012) studied the causal relationship between Kenyan stock prices and foreign exchange rates. The data was collected for the period November 2003 to May 2009 covering monthly observations of the NSE stock price index and nominal Kenya Shillings per US dollar exchange rates. The study used the error-correction model to test for causality and conducted stationary and cointegration tests between exchange rates and stock prices. The empirical findings revealed that both the first variations and level types of the foreign exchange rate and stock prices are non-stationary, and the two variables are integrated in order one. The results of this study showed that in Kenya, exchange rates Granger trigger stock prices. From exchange rates to stock prices, there is a one-way causality. As a result, changes in exchange rates have a major effect on stock price determination.

Wu, Lu, and Perez (2012) investigated the relationship between the US dollar and stock exchange indexes, with the Philippine Stock Exchange or PSEI as their target. Data for this study was collected for the period July 1997 to July 2010 which was collected from the Philippine Stock Exchange. Based on the co-integration measure, the study found that the US Dollar exchange rate and the PSEI had a significant long-term relationship. Although the PSEI's trend movement will gradually increase in the short run, the movement will tend to become zero whereas the growth of US dollar exchange rate will keep deteriorating.

2.3.3 Net Capital Flows and Stock Market Performance

Capital flows comprises of the movement of money in and out of the country for the purpose of investment, trade, or business operations. The net capital flows reflect the action of foreign and domestic agents. Net capital inflows are determined by subtracting capital outflows from the foreign agents' purchases of domestic assets. These gross capital flows, in turn, are influenced by the rewards that foreign and domestic agents face. For example, if agents have

access to better technology, they can invest more in foreign markets as compared to domestic markets. As a result, it seems fair to expect international and domestic agents to contribute different amounts to net capital flows. It is worthy of note that international capital flows have become an increasingly imperative source of capital for most countries especially the developing countries. This is partly due to the process of financial globalization which has accelerated the international economic integration of the emerging economies (Osaze, 2011).

The influence of capital flows has been studied widely. Loncan and Caldeira (2015) conducted a study on the various listed companies in Brazil. Using a 6-factors APT model, the study established that the stock markets highly relied on the capital flows. The study also found out that foreign portfolio capitals increased the market returns particularly in sectors related to cyclical consumption, commodities, and industry.

Feng, Lin and Wang (2012) studied the influence of capital flows on stock and housing returns in China. Data for this study was collected for the period 1997 to 2010. The study used a data-based LP method to determine the relationship between net capital flows on both stock market and housing returns. From the analysis, the study concluded that there was a statistically significant relationship between net capital flows and the stock market returns in China. The study found out that the influence of capital flow was instant.

Kumar (2013) conducted a study on the international financial flows and how they influenced the stock markets in India. Data for this study was collected for the period 2001 to 2012 and analysed using correlation and multi regression methods. The stock market performance data was collected from Sensex and Nifty which are the most popular stock market indices. Based on the findings, the study concluded that the net capital flows had an increasing

trend during the study period. The relationship between the net capital flows and the stock market performance was statistically significant.

In a study conducted in Nigeria, Omorokunwa (2018) analysed the influence relationship between foreign capital flow and stock market performance and identified that net capital flow influences the Nigerian stock market. Based on the findings, a conclusion was made that when the foreign capital inflows are boosted, the stock market responds positively. This is because the foreign capital can be used to enhance technology, administrative activities and other long-term developments of the market. Such developments in turn attracts a large number of investors in the market which in turn increases the market returns.

Anthony-Orji, Orji, and Ogbuabor (2018) conducted a study on the influence of economic growth and foreign private investment on the stock market performance in Nigeria. Data for this study was collected from various publications of the Central Bank of Nigeria for the period 1985–2016 and analysed using ordinary least square method. Based on the findings, a conclusion was made that capital inflow significantly influenced the Nigerian stock market. This implies a huge net capital flow is desirable for the stock market to grow. It is thus crucial for the government to devise and implement effective investor friendly policies that would encourage foreign investors to increase their participation in the stock market in order to promote economic growth and development.

Onyeisi, Odo, and Anoke (2016) analysed the foreign portfolio investment and the influence on the Nigerian stock market. Based from the analysis, the study concluded that there was no statistically significant relationship between capital flow and the stock market performance and growth. This was attributed to poor and unconducive business environment which did not attract foreign investment.

Locally, Gachanja (2018) studied the influence of foreign equity flow on the stock market returns at the NSE. The specific purpose of the study was to determine how the stock prices influence the domestic stock market and how foreign capital and equity flows impact on the stock market in the country. The study sought to determine whether capital and equity flows induce a surge in the stock market performance. Based on the findings, the study established that high net capital flows positively impact on the stock market in the country. Therefore, it was advisable for the government to ensure that relevant policies are devised and implemented in order to promote a good environment that attract capital inflow.

2.4 Knowledge Gap

Numerous research studies have been done on the macroeconomic environment and how it influences the stock markets. The findings have revealed that the macroeconomic variables influence the stock markets differently in different countries. There is therefore need for this study to determine how macroeconomic factors determine the stock market behavior in Kenya. Also, while some literature exists on the same, no comprehensive has covered different macroeconomic variables and their influence on the stock market behavior. Also, most of the available literature has touched on the influence of macroeconomic variables on stock prices. In addition, no research has been done recently on the influence of macroeconomic variables on stock market performance capturing the current macroeconomic environment in the country. Among the available studies locally, Ouma and Muriu (2014) studied the influence of exchange rates, money supply, and inflation on the stock market returns, Ndegwa (2015) focused on the exchange rates and money supply on stock market performance, and Olweny and Omondi (2011) focused on the influence of inflation rate, interest rate, and exchange rate on stock market returns volatility at the NSE. As revealed in the literature review, there is a literature gap and hence the rationale for this study.

2.5 Conceptual Framework

A conceptual framework presents the study variables and their interaction (Britton & McGonegal, 2007). The predictor variables in this study are interest rates, exchange rates and net capital flow. The stock market performance is the outcome variable. It is worthnotinng that changes in the macroeconomic environment causes uncertainties. Such uncertainties influence the trading patterns as well as the manner in which the investors distribute their portfolios. In this regard favorable macroeconomic environment reduces risks and in turn encourages investment in the stock market. Poor macroeconomic environment on the other increases risks this discouraging investment in the stocks of the listed firms. This in turn leads to poor NSE performance. The conceptual framework is presented as follows;

Independent Variable

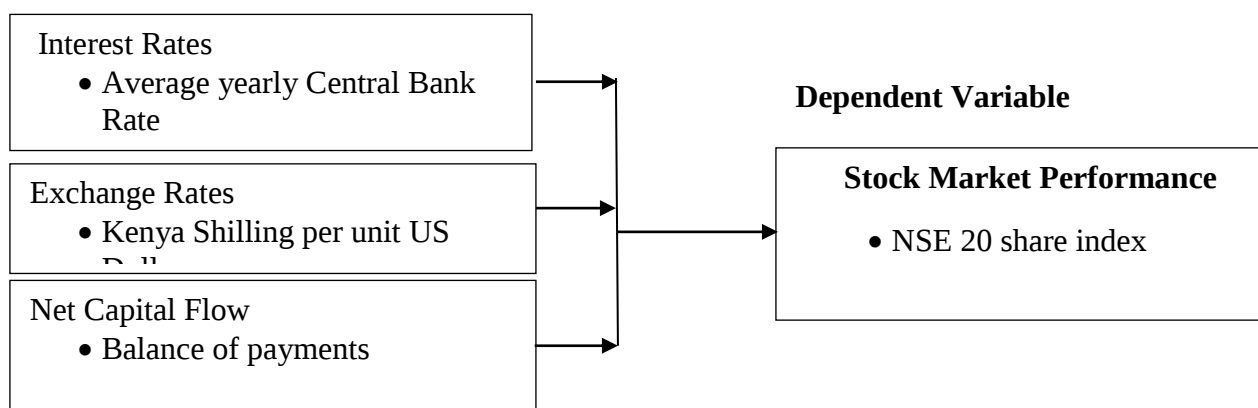


Figure 2.1: Conceptual Framework

2.5.1 Interest Rates

Interest rates refers to charges paid by borrowers to lenders to use the amount of the funds borrowed for a particular period of time. In this study, the purpose is to determine the influence of interest rates on stock market performance. It is expected that changes in the interest rates alter the stock market performance. Increase in interest rates are expected to discourage

borrowing which will in turn discourage investment in different economic sectors including the stock market. Reduced investment in the stocks will lead to poor performance. On the other hand, low interest rates encourage borrowing from the financial institutions which in turn increase investments in the economy including the stock market. In this study, interest rates will be measured in terms of Average Central Bank Rate

2.5.2 Exchange Rates

Exchange rates refers to the value of a country's currency against the currency of nations of economic zones. The exchange rates are highly volatile and they keep on fluctuating in an unpredictable manner. When such fluctuations occur, the cash flow of a firm and the operations of the firms are affected. The changes in the cash flow of a firm and the operation of a firm in turn affects the value of the firm which in turn affects the value in its stocks. In this study, it is expected that the uncertainty caused by exchange rates variation affects the stocks of the listed firms which in turn affects the stock market index.

2.5.3 Net Capital Flows

Capital flows is the movement of money in and out of the country through investments, trade, and business. Currently, international capital flows have become an increasingly key source of income for most nations especially the developing economies. In this study, it is hypothesized that an increase in net capital flows in the countries encourages investment in the stock market which in turn improve the overall performance. In this study, net capital flows will be measured in terms of Balance of payments.

2.5.4 Stock Market Performance

The stock market behavior highly depends on the macroeconomic environment of a country. This is because favorable macroeconomic environment encourages investment, trade, and business operations. In such environment, there is high trading of stocks which leads to

overall improvement in the stock market performance. In this study, it is hypothesized that interest rates changes, money supply, economic growth, and net capital flows would influence the stock market behavior. The stock market performance will be measured in terms of NSE 20 share index

2.6 Operationalization of Variables

The purpose of the study is analyzing how macroeconomic factors influence the Kenyan stock market. The independent variables are interest rates, exchange rates, and net capital flow. The dependent variable is stock market performance. The variables are operationalized as follows;

TABLE 2.1
Operationalization of variables

Category	Variable	Scale	Measurement
Independent Variables	Interest rates	Ratio	Average Central Bank Rate
	Exchange rates	Ratio	Kenya Shilling per unit US Dollar
	Net capital flow	Ratio	Balance of payments
Dependent Variable	Stock market performance	Ratio	NSE20 Index

CHAPTER THREE

RESEARCH METHDOLOGY

3.1 Introduction

This chapter covers the methods and procedures used to undertake the study. The pertinent issues discussed here include the design, the population of interest, the sampling methods used, and methods of data collection and analysis. The section also covers the ethical guidelines observed when undertaking the study.

3.2 Research Design

A research design is a plan that researchers use to conduct research studies (Creswell & Poth, 2017). It is a structure that gives an outline on how research studies are undertaken (Creswell & Creswell, 2017). It defines how data is gathered and analyzed in order to meet specific research objectives. This study employed a descriptive research design. This design is considered suitable when the purpose is to get a description of the research phenomenon without changing the research variables. The use of a descriptive design made it possible to gain a profound understanding on how the microenvironment in the country has impacted in the NSE performance.

The study utilized a quantitative research approach, a method that involves quantification and analysis of variables in order to obtain results. This method uses numerical methods and statistical techniques to analyze data to answer questions like who, how much, what, where, when, how many, and how. Aliaga and Gunderson (2002) argues that this method gives an explanation of an issue or research phenomenon by use of data gathered and analyzed with the help of scientific and mathematical techniques. This method is less time consuming and yield more reliable and accurate results. Creswell (2009) further argues that this method is preferable

when testing theories as it makes it possible to examine the nexus between the study variables, makes it possible to control for alternate explanations, and reduces subjectivity

3.3 Target Population

A target population comprises of a collection of items or human subjects that the researcher is interested in studying (Cooper & Emory, 2003). The researcher sources data from the target population in order to make inferences in line with the research purpose and objectives. This population has all the traits the researcher is interested in (Malhotra & Birks, 2006). The study targets all the companies listed at the NSE and the market returns for the period 1990 to 2019. In this study, no sampling was done because the study did not focus on the individual firm's stock performance.

3.4 Sampling Procedure

A sample refers to a group or a sub section of the population chosen to represent the total population of interest (Schindler & Cooper, 2014). Sampling is necessary when the target population is large. In such large populations, time and resources constraints make it necessary for sampling. In this study, the target population is small and manageable and hence no sampling was done required. Also, the study did not focus on the performance of individual firm's stock and hence the need for sampling.

3.5 Data Collection

Secondary data was used in this study. The NSE offered sufficient accurate secondary data particularly pertaining to the stock market performance. Data on interest rates, exchange rates, and net capital flow were obtained from the KNBS. CBK and KNBS are credible sources that contain accurate and reliable data that helped to yield reliable findings.

3.6 Data Analysis

Data analysis was done using STATA. This was done using time series analysis. Exploratory time series analysis was done first to determine the characteristics of the dataset. This helped to determine analytical methods to use as well as the determine the models to use. An identification was done by plotting the graph to determine the trend analysis on all the variables in order to ascertain the behavior across the time period.

The data was analyzed using Autoregressive-Distributed Lag model (ARDL). This regression model has been in use for decades and as gained huge relevance in determining ad testing long term relationship between economic time series data. This can be used to test cointegration and determine the short run and the long run relationship regardless whether the time series is stationary or non-stationary. The basic form of the ARDL model is as follows;

$$Y_t = \beta_0 + \beta_1 y_{t-1} + \dots + \beta_p y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots + \alpha_q x_{t-q} + \varepsilon_t$$

Where

ε_t is the random disturbance

This model is autoregressive in the sense that Y_t is explained partly by lagged values of itself. It also has a distributed lag component in the form of successive lags of “x” explanatory variable.

3.7 Diagnostic Tests

3.7.1 Pre-estimation Tests

The pre-estimation test involved a test for stationarity. Stationarity of data occurs when the mean and variance do not change over time. It is worth noting that if time series data is not stationary, the estimation results do not have economic meaning. Therefore, if the time series data is not stationary, it is vital to convert it to stationary data by differencing. The most suitable test for stationarity test is the Dickey-Fuller test for a unit root (DeFusco et al., 2007). Therefore, Augmented Dickey-Fuller (ADF) test was used to test for the presence of unit root in the variables used in the study.

3.7.2 Post Estimation Tests

Post estimation tests are conducted to determine how the model used is effective in explaining the relationship between variables in the study. The post estimation tests that were done using the Granger Causality test. This test was done to determine the direction between the two-time series. In this study, the Granger Causality Test was done to determine the relationship between the stock market and the macroeconomic variables over time.

3.8 Research Ethics

Research ethics refers to the norms and rules that the researchers should follow when undertaking research studies. This research study was guided by ethical rules and standards. The researcher obtained a university permit before commencing to data collection. During data collection, and since the data was sourced from secondary sources, the researcher ensured all the sources used are valid and reliable. Also, the researcher ensured that all the sources of data are acknowledged through citing. In analysis, all the interpretations were made without bias and that the data and the findings are strictly used for academic purpose. Also, no data or information about the listed companies was disclosed without permission.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This section presents data analysis and presentation of the research findings. The data was collected on Quarterly basis and covered a period of 30years between the year 1990 to 2019 calendar years. The study targeted all the companies that make up the NSE 20 Share Index as at 31st December 2019. The purpose of the study was to determine which macroeconomic variables had a significant impact on the stock market returns in Kenya. The specific objectives of the study were: to find out the effects of exchange rates on the performance of the NSE 20 Share index in Kenya, to establish the effects balance of payment on the performance of NSE 20 Share index in Kenya and to determine effects of interest rates on the performance of NSE 20 Share index in Kenya. The analysis has been done in line with the research objectives. The first section presents diagnostic tests to determine the suitability of the data for different tests. The second section presents a descriptive analysis of the study variables, the third section has modelled the data to determine the relationship between the macroeconomic variables and the NSE performance. In addition, regression analysis was done to determine the effect of the independent variables on the dependent variables. The last section discusses the findings in relation to other existing studies.

4.2 Descriptive Statistics

In this section, descriptive analysis was to done to summarize and explain the data in order to get a profound understanding of the study variables. The findings are presented in the table 4.1;

TABLE 4.1
Descriptive Analysis

Variable		Obs	Mean	Std. Dev.	Min	Max
rates	Exchange	120	71.28	24.096	7.42	103.52
	Interest Rates	120	5.72	4.89	0.97	6.94
Payment	Balance of	120	-21033.91	-61805.02	-171623	-150900.5
	NSE	120	3033.62	1080.68	1061.89	5645.65

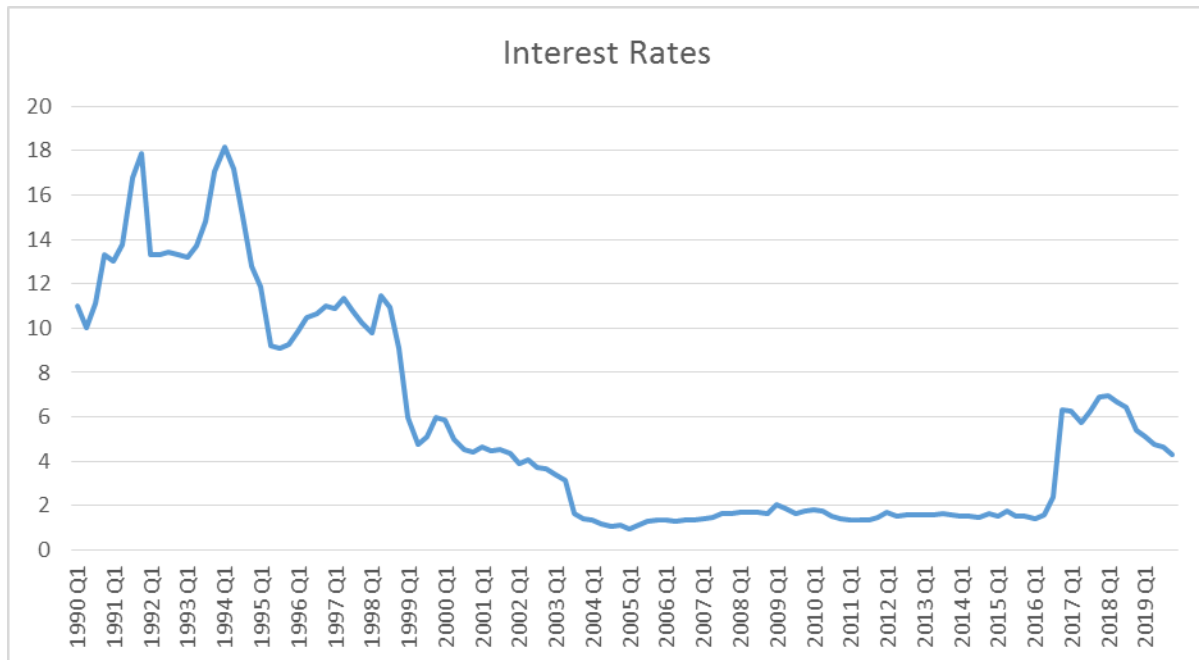
From the findings on table 4.1, exchange rate had an average of 71.28 and a standard deviation of 24.09. Highest Exchange rate vale recorded was 103.52 while the lowest value was 7.42. Regarding the interest rates, the average was 5.72 with a standard deviation of 4.89447. The highest interest rate recorded was 6.94 while the lowest value recorded was 0.97. Regarding the Balance of Payment, the average was -21033.91 with a standard deviation of -61805.02. The highest BOP recorded in the study period was 150900.5 while the minimum value recorded was -171623. Regarding the NSE, the average value obtained was 3033.62 with a standard deviation of 1080. 68.The highest performance recorded was 5645.65 while the lowest value recorded was 1061.89.

Further analysis was done to determine the trend of the variables. This was done to determine the direction of the variables over time. This helped to determine whether the variables had been increasing, decreasing or constant over time.

4.2.1 Interest Rates

Analysis here was done determine the trend in the interest rates overtime in the study period. From the analysis, the interest rates had an increasing trend between the first quarter of 1990 and the first quarter of 1991. The interest rates had a declining trend in 1992 after which they tend to remain constant in 1993. In 1994 there was an increasing trend in the interest rates after which they started declining. In 2017, there was an increase in the trend followed by a decline. The findings are presented in the figure 4.1

FIGURE 4.1
Interest rates trend analysis



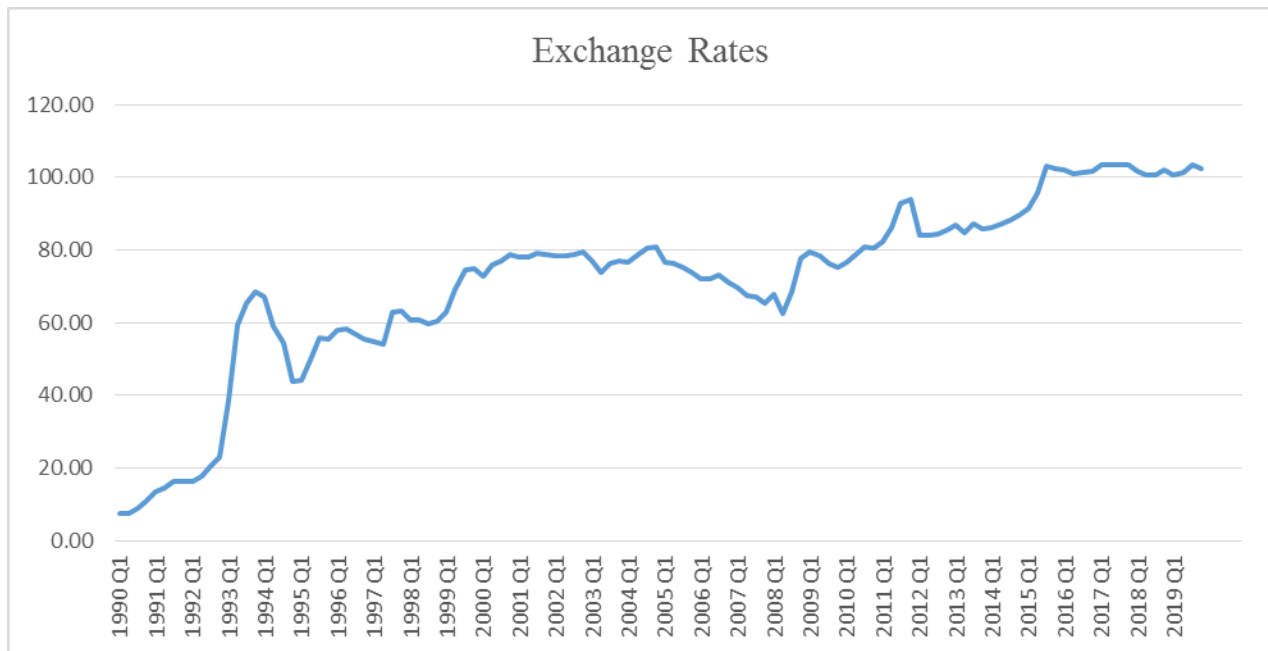
4.2.2 Exchange rates

The purpose of the analysis here was to determine the trend of exchange rates over time. Foreign exchange rate used was the US Dollar. This currency is regarded the strongest and it is also the most traded foreign currency in Kenya besides in the Nairobi Securities Exchange. The

study used the US Dollar exchange rates from the period of 1990 to 2019. The trend analysis findings are presented in the figure 4.2;

FIGURE 4.2

Exchange rates trend analysis

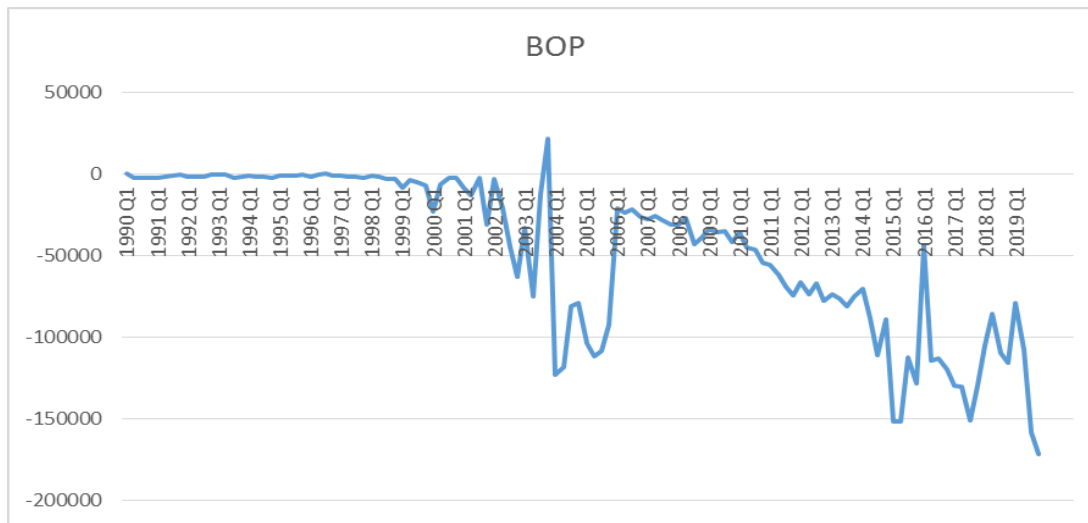


From the analysis, exchange rate had an increasing trend over time from 1992 to 2019. However, there were significant fluctuations in exchange rates over time. The minimum value of exchange rate recorded was 62.65 while the highest value obtained was 103.52.

4.2.3 Balance of Payment

The purpose of the analysis here was to determine the trend of BOP over time for the study period. Based on the findings, the BOP was negative throughout the study period and was highly fluctuating. The trend analysis findings are presented on figure 4.3;

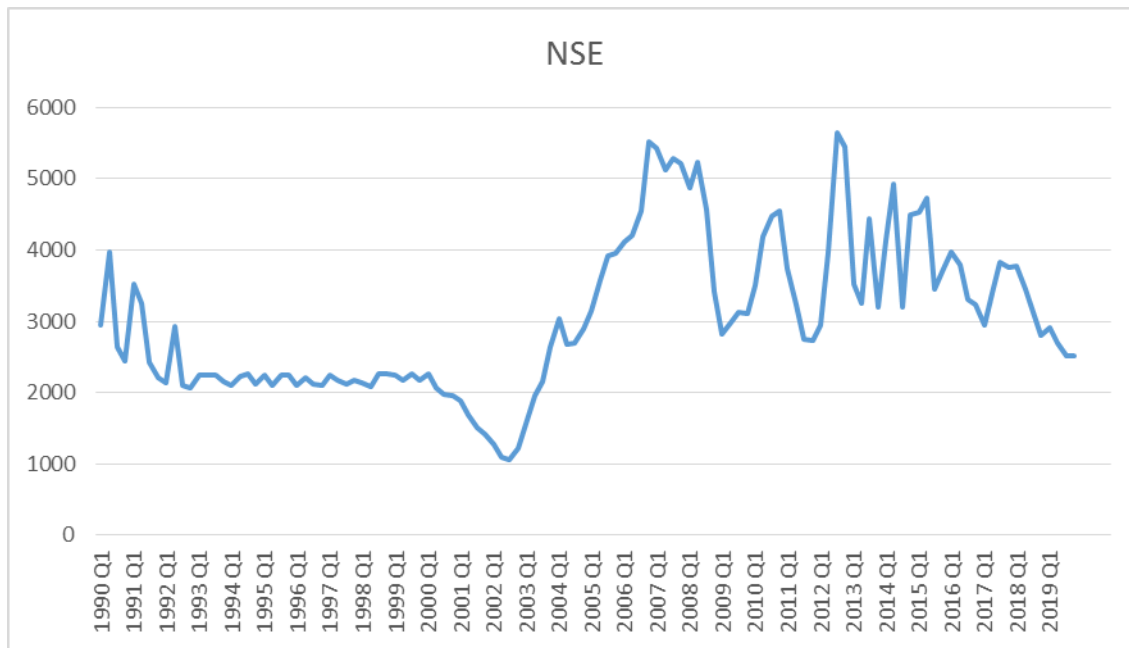
FIGURE 4.3
BOP trend analysis



4.2.4 NSE Performance

Analysis here was done to determine the trend in the NSE 20 Share Index in the period 1990 to 2019 collected in quarters. From the analysis, the study observed that throughout the study period, the NSE 20 Share Index had an irregular rise and fall. Figure 4.3 shows high volatility in the index value with maximum returns of 5525 and minimum value of 2509.333. The fluctuations in the NSE index are as a result of various monetary and government policies and due to changes in the macroeconomic environment in the country over the study period. It is worth noting that the NSE index is highly sensitive to changes in the macroeconomic climate of the country, hence the numerous fluctuations. The trend in the NSE index is illustrated on figure 4.4;

FIGURE 4.4
NSE Trend analysis



4.3 Pre-Estimations Tests

4.3.1 Normality Tests

Test of normality was done to determine whether the variables are normally distributed or not. This was done using Shapiro-Wilk test. The findings are presented on the table 4.2

TABLE 4.2

Variables	Test of normality				
	Obs	W	V	Z	Prob>z
Interest Rates	120	0.941	1.769	1.175	0.120
Exchange Rates	120	0.840	4.827	3.241	0.601
BOP	120	0.889	3.357	2.493	0.306
NSE	120	0.875	3.774	2.734	0.103

Based on the findings on table 4.2, the Shapiro-Wilk p values of all the variables are greater than that 0.05. This means that they are not significant which implies that the variables are normally distributed.

4.3.2 Stationarity Tests

Test for stationarity was done to determine if the data is stationary. Time series data is often known to have problems with non-stationary. Therefore, it is important to determine whether a series is stationary, that is, it does not contain a unit root) or not stationary, that is contains a unit root before using it. Test for stationary was done using the Augmented Dickey-Fuller test for unit root. According to DeFusco et al. (2007) Dicky Fuller test is the most common test of non-stationary currently. In this study, the Dicky Fuller Test is used to find out whether the economic variables in the study contain unit root. In using this test, the null hypothesis tested is that the variables contain a unit root, against the alternative that the variables do not have a unit root. The findings are presented in the table 4.3

TABLE 4.3
Unit root test

Variables	Dickey-Fuller test for unit root		Number of obs =120
	t-statistic	Critical value (5%)	P-value
NSE Performance	-3.660	-2.966	0.005
Interest rates	-5.081	-2.928	0.000
Exchange rates	-5.564	-2.928	0.000
BOP	-3.246	-2.929	0.018

From the findings on the table 4.3, in absolute terms, the Test Statistic value for interest rates is less than the critical values at 5%. This implies that the first order differenced interest rate data is stationarity. In the initial tests, the Augmented Dickey-Fuller test for unit root indicated that the data had a unit root and hence not stationary. The data was therefore differenced in order to make it stationary. For exchange rates, in absolute terms, the value of Test Statistic is greater than the critical values at 5%. This indicates that the exchange rate is stationary. This was however achieved by obtaining order 1 differencing of the data as the original data was not stationary. Regarding BOP, in absolute terms, the value of Test Statistic is greater than the critical values at 5%. This indicates that BOP is stationary. Regarding NSE, in absolute terms, the value of Test Statistic is greater than the critical values at 5%. This indicates that NSE data was stationary. This was however achieved by obtaining order 1 differencing of the data as the original data was not stationary.

4.3.3 Optimal Lag Selection

The findings on table 4.4 indicate optimal lag length at lag 1. It has the smallest value and gives efficient estimates. Therefore, lag 1 was chosen as an optimal lag. The findings are presented on the table below;

TABLE 4.4
Optimal Lag Selection for NSE Performance

Selection-order criteria

Sample: 5 - 120

Number of obs = 116

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-975.755				1.2e+06	16.8406	16.8502	16.8643
1	-884.598	182.31*	1	0.000	254817*	15.2862*	15.3054*	15.3337*
2	-884.582	.0329	1	0.856	259177	15.3031	15.332	15.3743
3	-882.843	3.4783	1	0.062	255899	15.2904	15.3289	15.3853
4	-882.652	.38161	1	0.537	259501	15.3043	15.3525	15.423

For the NSE using the AIC criteria, lag 1 was chosen as it had the smallest values and would give the best estimates.

TABLE 4.5
Optimal Lag Selection for Interest rates

Selection-order criteria

Sample: 5 - 120

Number of obs = 116

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-347.411				23.7888	6.00709	6.01673	6.03083
1	-155.248	384.33	1	0.000	.880998	2.71117	2.73045	2.75865
2	-149.667	11.162*	1	0.001	.814097	2.63219	2.6611	2.7034*
3	-147.983	3.3683	1	0.066	.804564*	2.62039*	2.65894*	2.71535
4	-147.776	.41312	1	0.520	.815667	2.63407	2.68226	2.75276

For the interest rates, using the AIC criteria, lag three was chosen as it had the smallest values and would give the best estimates.

TABLE 4.6
Optimal Lag Selection for exchange rates

Selection-order criteria

Sample: 5 - 120

Number of obs = 116

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-509.928				391.989	8.80911	8.81875	8.83285
1	-295.553	428.75*	1	0.000	9.89812	5.13022	5.14949*	5.17769*
2	-295.133	.84015	1	0.359	9.99767	5.14022	5.16913	5.21143
3	-293.294	3.6773	1	0.055	9.8543*	5.12576*	5.1643	5.22071
4	-293.148	.29163	1	0.589	10.0008	5.14049	5.18867	5.25917

For the exchange, using the AIC criteria, lag three was chosen as it had the smallest values and would give the best estimates.

TABLE 4.7
Optimal Lag Selection for BOP

Selection-order criteria

Sample: 5 - 120

Number of obs = 116

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1406.1				2.0e+09	24.2603	24.2699	24.284
1	-1336.69	138.81	1	0.000	6.2e+08	23.0809	23.1002*	23.1284*
2	-1335.57	2.2453	1	0.134	6.2e+08	23.0788	23.1077	23.15
3	-1335.24	.66926	1	0.413	6.2e+08	23.0903	23.1288	23.1852
4	-1332.7	5.0814*	1	0.024	6.1e+08*	23.0637*	23.1119	23.1824

For the BOP using the AIC criteria, lag three was chosen as it had the smallest values and would give the best estimates.

4.3.4 Seral Correlation

Autocorrelation is the situation whereby the residual terms of the independent variables are correlated with each other. Positive serial correlation results in coefficient standard errors which are too small leading to misleading results. The null hypothesis is that the residuals are not correlated. The seral correlation test results are presented in the table below;

TABLE 4.8
Serial Correlation

Breusch-Godfrey Serial Correlation			
F-statistics	1. 736	Probability	0.012
Obs*R-squared	2.688	Probability	0. 326

Based on the analysis, the Breusch-Godfrey serial correlation test gives a probability of 0.0116. This value is significant and a conclusion is made that there is no autocorrelation.

4.3.5 ARDL Bounds Test of Cointegration

Analysis was done to determine the order of integration of each variable. This was done using the Johansen tests for cointegration. The findings are presented on the table below;

TABLE 4.9
Johansen tests for cointegration

Johansen tests for cointegration

Trend: constant

Number of obs = 120

Sample: 1990q1 - 2019q4

Lags = 2

Maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	12	-301.220		.8280	29.68
1	17	-287.791	0.705	8.969*	15.41
2	20	-283.829	0.302	1.045	3.76
3	21	-283.306	0.046		

Based on the findings on table 4.9 there was cointegration of order 2 because it is the last order in which the trace statistics at $r=0$ is greater than the critical value.

4.4: Relationship between Macroeconomic variables and NSE Performance

Analysis here was done to determine the relationship between the different macroeconomic variable and NSE performance. This involves correlation and Granger Causality Tests.

4.4.1 Correlation Analysis

Correlation analysis was conducted to find out the nexus between the macroeconomic variables and the performance of NSE. The analysis also helped to determine the direction of the relationship between the macroeconomic variables and the NSE performance.

TABLE 4.10
Correlation Analysis

	IR	ER	BOP	NSE
IR	1.0000			
ER	-0.6804	1.0000		
BOP	0.147	-0.3612	1.0000	
NSE	-0.5165	-0.2865	0.3164	1.0000

Based on the findings on table 4.10, there was negative relationship between interest rates and NSE performance. The negative Pearson correlation coefficient (-0.5165) indicated that there was an inverse relationship between the interest rates and the NSE performance, that is an increase in the interest rates led to a reduction in the NSE performance. This can be interpreted to mean that an increase in the interest rates discourages investors from taking loans, and reduces investments including investment in the NSE.

Regarding the exchange rates, there was a negative relationship between exchange rates and NSE performance. The negative Pearson correlation coefficient (-0.2865) indicates that an increase in the interest rates leads to a decline in the NSE performance. This can be interpreted to mean that an increase in the exchange rates reduces investments including investment in the NSE.

Finally, there was a positive relationship between BOP and NSE performance. The positive Pearson correlation coefficient (0.3164) indicates that an increase in the BOP increases the NSE performance. This can be interpreted to mean that favorable trade balance attracts investments into the country including investments in the NSE.

4.4.2. ARDL Model

The data was analyzed using Autoregressive-Distributed Lag model (ARDL). This model has been considered suitable and has been in use for decades and has gained huge relevance in determining and testing economic time series data. This model is suitable in determining both the short run and the long run relationship regardless whether the time series is stationary or non-stationary. In this study, the ARDL model for exchange rates, interest rates, BOP and NSE is presented as follows;

TABLE 4.11
ARDL model

ARDL(1,3,0,4) regression

Sample:	5 - 120	Number of obs =	116
		F(11, 104) =	48.22
		Prob > F =	0.0000
		R-squared =	0.8361
		Adj R-squared =	0.8187
Log likelihood = -870.87227		Root MSE =	465.5319

nse	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
nse						
L1.	.7702126	.0521646	14.77	0.000	.6667683	.873657
ir						
--.	1.682341	50.53527	0.03	0.974	-98.53099	101.8957
L1.	-81.75832	81.87365	-1.00	0.320	-244.1168	80.6002
L2.	151.8205	81.16399	1.87	0.064	-9.130701	312.7718
L3.	-112.1063	49.37465	-2.27	0.025	-210.0181	-14.19456
er	-11.17445	4.032628	-2.77	0.007	-19.1713	-3.177597
bop						
--.	-.0042812	.0018985	-2.26	0.026	-.008046	-.0005164
L1.	.004326	.0022292	1.94	0.055	-.0000946	.0087465
L2.	-.0013638	.0022114	-0.62	0.539	-.0057491	.0030214
L3.	-.0003739	.0022356	-0.17	0.868	-.0048073	.0040595
L4.	-.0033505	.0019259	-1.74	0.085	-.0071697	.0004686
_cons	1540.994	396.5165	3.89	0.000	754.6866	2327.301

Based on the findings on table 4.11, the ARDL model was statistically significant since the p value obtained 0.0000 was less than 0.05. The R-squared value obtained 0.8361 shows that generally, the macroeconomic variables, that is interest rates, exchange rates, and BOP explained 83.61% variability in the stock market performance while the other 16.39% is explained by other macroeconomic variables ceteris paribus. Regarding the interest rates, the variable was significant at lag 3 since the p value (0.025) was less than the significance level 0.005. Regarding the

exchange rates, the variable was significant at lag 0 since the p value obtained 0.007 was less than the significance value, 0.05. Regarding BOP, the variable was significant] Lag 0 since the p value obtained 0.026 was less than the significance value, 0.05.

4.4.3 Granger Causality Test

The Granger Causality test was done to determine the effect of the independent variables on the dependent variables. This is a statistical test done to determine if a series can be used to predict another series over a specified time. In this test, the null hypothesis is rejected if the P value was less than the critical value of 0.05, the null hypothesis was rejected. In this case, the test was done to determine whether interest rates, exchange rates and BOP granger cause the NSE performance. The purpose was to test the following hypothesis;

Ho: The macroeconomic factors do not granger cause the NSE performance

H1: The macroeconomic factors granger cause NSE performance.

TABLE 4.12
Granger Causality Results

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
NSE Index						
Exchange Rates						
L1.	9.325198	15.81132	0.59	0.045	-21.66443	40.31482
L2.	-14.61107	16.15417	-0.90	0.036	-46.27267	17.05053
Interest Rates						
L1.	-43.09748	67.31477	-0.64	0.022	-175.032	88.83705
L2.	28.73306	65.62592	0.44	0.026	-99.89139	157.3575
Balance of Payment						
L1.	.0001818	.0008943	0.20	0.039	-.0015709	.0019346
L2.	.0005658	.0008585	0.66	0.040	-.0011168	.0022483

Based on the analysis findings on table 4.12, both lag 1 and lag 2 values of exchange rate granger cause the NSE performance. This is because, in both cases, the p values are less than 0.05. The null hypothesis is thus rejected and a conclusion made that exchange rate variations granger cause the NSE performance. The analysis reshow that the NSE performance can be

predicted using exchange rates. This implies that when exchange rates vary, the stock market trends are distorted which leaves investors with high uncertainties on the investment actions to take. Regarding the interest rates, the p values for both lag 1 and Lag 2 were less than 0.05. The null hypothesis is thus rejected and a conclusion made that interest rates grange cause the NSE performance. The findings imply that changes in interest rates can be used to predict the NSE performance. Regarding the Balance of Payment, the p values for both lag 1 and lag 2 were less than 0.05. The null hypothesis is thus rejected and a conclusion made that the BOP can granger cause NSE performance. The findings imply that BOP can be used to predict NSE performance. Generally, the findings indicate that macroeconomic variables cause changes in the NSE performance. This indicates that variations in the macroeconomic environment in the country cause variations in the NSE performance.

4.5 Discussion of the Findings

The macroeconomic environment is a key determinant of business activities and business performance. In this study, the purpose was to determine the effect of selected macroeconomic variables on stock market performance, in this case focusing on the effect of exchange rates, interest rates and BOP on the NSE performance. From that analysis, there was a statistically significant relationship between the exchange rates and the NSE performance. The study observed that there was a high exchange rate movement which was in this case was accompanied by high changes in the NSE performance. The findings can be interpreted to mean during periods of high exchange volatility, investors are discouraged from investing in the local market including buying stocks. The high stock market return volatility reflects higher risks which discourages investment. On the other hand, low exchange rate movements lead to low uncertainty in the stock market which in turn encourages foreign investors to participate in the stock trade. This leads to high stock market returns.

The findings are in agreement with Ndunda (2016) who in an analysis of NSE reaction to macroeconomic variable established that there was a weak negative association between the stock market and exchange rates. The findings are also in line with the findings of Perera (2016) who in a study on the effect of exchange rate volatility on the stock market concluded that the exchange rate movements had an impact on ASPI return volatility. Similarly, the findings are in agreement Sichoongwe (2016) in Zambia whereby exchange rates had significant negative effect on the stock market performance. Also, the findings are in agreement with Wu, Lu, and Perez (2012) analysed the effect of exchange rate changes on the Philippine Stock Exchange and found out that the US Dollar exchange rate and the PSE had a significant long-term relationship.

The study concluded that stock exchange variations were significant determinants of stock market returns. Other studies with similar findings were obtained by Rabai and Khakan (2016) who concluded that exchange rates in India had significant effect on the stock market, and Musa (2014) who conducted a study on the relationship between exchange rate volatility and stock market performance in Kenya and established a significant inverse relationship between exchange rates and the stock market performance in Kenya. Contrasting findings were obtained by Mugambi and Koech (2016) who established that exchange rate fluctuations did not have significant effect on stock market performance. Another study with contrasting findings were obtained by Nyongesa and Muchoki (2016) who established a weak relationship between exchange rate movements and NSE performance. Furthermore, Coleman and Agyire-Tetty (2008) obtained contrary findings in a study on the effect of macroeconomic factors on the stock market performance in Ghana in which exchange rates did not have significant effect on the stock market performance.

The interest rate is another macroeconomic factor that influences business activities and business returns. In this study, the findings indicated that the interest rates have been fluctuating and increasing over time. The study also established that there was a statistically significant relationship between interest rates and the NSE performance. The relationship was negative which implies that an increase in the interest rates leads to a decline in NSE performance. The findings imply that an increase in the interest increases lending rates by financial institutions which in turn reduces investment in different sectors including investment in the stock market. Variations in the interest rates affect both business operations and investment behaviors. This is attributable to the fact that an increase interest slows down businesses operations which in turn translates to poor returns in the market.

The findings are consistent with Talla (2013) who conducted a study on the effect of macroeconomic factors on the Stockholm Stock Exchange and established that changes in the interest rates led to significant variations the stock market performance. In another study with similar results, Eldomiaty et al (2019) established that a positive relationship between the real interest rates and the stock market performance. Similarly, Addo and Sunzuoye (2013) conducted a study on the effect interest rates on the stock market in Ghana and established that interest rates had statistically significant effect on the stock market. Other studies with consistent findings were done by Barakat et al. (2016) and Olweny and Omondi (2011) who concluded that changes in the interest rates led to significant variations in the stock market performance. On the contrary, Omodero and Mlangi (2019) conducted a study on the relationship between interest rates and the Nigerian Stock market and established that interest rates did not have statistically significant effect on the stock market performance. Also, Chirchir (2012) obtained contrary

findings who in a study on the effect of interest rates on the stock market performance found out that there was no significant relationship between interest rates and stock market performance.

Net capital flows is another macroeconomic variable that affect the stock market performance in Kenya. Based on the analysis, there was a statistically significant relationship between the net capital flows and the stock market returns. The findings from the Granger causality test results, balance of payment Granger cause NSE performance. The findings imply that changes in the net capital flows can predict the NSE performance. When the country's BOP is favorable, investors are attracted to invest in the country including investment in the NSE. This in turn enhance the NSE performance. On the other hand, poor and unfavorable BOP discourage investment in the country including investment in the NSE. This in turn leads to poor performance of the listed companies. Generally, the study found out that positive and favorable net income improves the NSE performance that is when the foreign capital inflows are boosted, the stock market responds positively. This is because the foreign capital can be used to enhance technology, administrative activities and other long-term developments of the market. Such developments in turn attracts a large number of investors in the market which in turn increases the market returns.

The findings agree with Loncan and Caldeira (2015) who conducted a study on the influence of foreign portfolio capital flows on stock market performance in Brazil and found out that foreign portfolio capital flows significantly influenced the stock markets. The study also found out that foreign portfolio capitals increased the market returns particularly in sectors related to commodities, industry and cyclical consumption. The findings are also in agreement with Feng, Lin and Wang (2012) on the influence of capital flows on stock and housing returns in China. The study established a statistically significant relationship between net capital flows

and the stock market returns in China. Further the study findings agree with Kumar (2013) on the international financial flows and how they influenced the stock markets in India. The findings of the study established that the net capital flows had an increasing trend during the study period.

The relationship between the net capital flows and the stock market performance was statistically significant. Other agreeing findings were obtained by Omorokunwa (2018) who conducted a study on the relationship between foreign capital flow and stock market performance in Nigeria and discovered that net capital flow influences the Nigerian stock market. Similar findings in the local context were obtained by Gachanja (2018) who in a study on the influence of foreign equity flow on the stock market returns at the Nairobi stock exchange established a positive and significant relationship between the net capital flows and the stock market performance.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of the study findings, conclusions, policy recommendations, and suggestions for further research. The purpose of the study was to determine the effect of macroeconomic factors on NSE performance. Specifically, the study sought to determine the influence of exchange rates, interest rates, and BOP on the NSE performance.

5.1 Summary of Findings

The study sought to determine the effect of the macroeconomic environment in the country on NSE performance. Specifically, the study sought to analyze how changes in the exchange rates, interest rates, and BOP influences NSE performance. A descriptive research was used in this study and data collected for the duration between 1989 and 2019. Analysis was done using both descriptive and inferential analysis methods. Descriptive analysis was done using means and percentages. Inferential analysis was done using time series analysis.

Regarding the exchange rates, the study observed that the exchange rates has been having an increasing trend over time from 1989 to 2019. The exchange rate average was 87.06905 with a standard deviation of 12.69. The lowest value record was 62.65 while the maximum value recorded was 103.52. From the trend, the study found out that the exchange rates have been greatly fluctuating over time in the study period. These changes can be attributed to changes in the economic conditions in the country and variations in the macroeconomic environment in the country.

With regard to interest rates, the average was 2.57 with a standard deviation of 1.86. The maximum value obtained was 6.94 while the lowest value recorded was 1.30. The interest rates

had a declining trend from 1991 to 2004. The interest tends to remain constant between 2004 and 2016 after which it increased to 2017. The trend then started declining through to 2019. The changes in the interest rates can be attributed to changes in the economic conditions in the country.

Regarding the Balance of Payment, the average was -65635.7 with a standard deviation of 55175.93. The highest BOP recorded in the study period was 150900.5 while the minimum value recorded was -171623. Regarding the NSE, the average value obtained was 3870.181 with a standard deviation of 819.0011. The highest performance recorded was 5525 while the lowest value recorded was 2509.333. The study found out that the NSE 20 Share Index had an irregular rise and fall trend throughout the study period.

On the relationship between the macroeconomic variables and NSE performance, the study established a statistically significant relationship between exchange rates and NSE performance ($p \text{ value} = 0.000 < 0.05$). This implies that changes in exchange rates led to significant changes in the NSE performance. The correlation coefficient was negative implying that changes in exchange rates led to a decline in NSE performance and vice versa. Regarding the interest rates, the study found out a significant relationship between the interest rates and NSE performance ($P \text{ value } 0.0010 < 0.005$). The findings imply that a change in the interest rates led to significant changes in NSE performance. The correlation coefficient was negative which implies that an increase in the interest rates led to decline in the NSE performance. This can be interpreted to mean that an increase in interest rates discourages borrowing which in turn discourages investment including investment in the NSE. This in turn led to reduced performance. The study also found out a significant relationship between the BOP and NSE performance. This implies that changes in the BOP led to significant changes in the NSE

performance. The correlation coefficient between BOP and NSE was positive implying that an increase in the BOP led to an increase in the NSE performance. The findings could be interpreted to mean that favorable balance of trade encouraged investment and, in this case, a healthy BOP encouraged investment in the NSE.

Granger causality test was done to determine whether interest rates, exchange rates, and balance of payment granger cause the NSE performance. From the analysis, the study found out that both lag 1 and lag 2 values of exchange rate granger cause the NSE performance. This is because, in both cases, the probability values were less than 0.05. The findings imply that exchange rates can be used to predict changes in the NSE performance. This implies that investors with interest in the stock market can base their investment decisions based on the changes in the exchange rates. High exchange rates would discourage foreign investment in the stock market while low exchange rates would encourage investors to invest in the NSE. On interest rates, the granger causality test indicated that interest rates granger causes the NSE performance. This is because, both lag 1 and lag 2 values had p values less than 0.05. The findings indicated that interest rates can be used to predict the NSE performance. When interest rates are high, investors are discouraged from taking loans and investing in different sectors including the NSE. Hence, the NSE performance is expected to be low. On the other hand, low interest rates encourage investors to take loans and invest in various sectors including the NSE.

Regarding the Balance of Payment, the granger causality test indicated that balance of payment granger cause NSE performance. This is because the p values for both lag 1 and lag 2 were less than 0.05. The findings indicate that BOP can be used to predict the NSE performance. Favorable BOP would encourage investors to invest in the country including investment in the NSE. On the other hand, low and unfavorable BOP would indicate poor economic conditions

which in turn would discourage investment in the country including investment in the stock market. Generally, the granger causality test indicated that the macroeconomic variables in the country are predictors of the NSE performance.

On the effect of the macroeconomic variables on the NSE performance, the study established that the lagged values of exchange rates, interest rates and BOP cause changes in the NSE performance. This indicates that variations in the macroeconomic environment in the country cause variations in the NSE performance. The p value obtained was small which implied that changes in the macroeconomic variables caused significant changes in the NSE performance.

5.2 Conclusion

Based on the study findings, the study concludes that the macroeconomic environment in the country over the study period have been changing greatly. There were huge variations in the interest rates, exchange rates, and BOP. Based on the granger causality test, the study concludes that interest rates granger cause NSE performance, hence, the interest changes can be used to forecast changes in the NSE performance. Changes in the interest rates is there a key factor used by investors in making investment decisions when buying stocks in the NSE. The granger causality test also found out that exchange rates granger causes the NSE performance. This implies that investors in the stock market can base their decision on the exchange rates. From ARDL model, there was a statistically significant relationship between exchange rates and NSE performance. Specifically, the study concludes that exchange rates significantly influence the NSE performance in that an increase in exchange rates leads to a decline in the NSE performance. This means that an increase in the exchange rates reduces foreign participation in the NSE. This is likely to lower the returns and hence a low NSE index. A stable currency is thus

crucial as it helps to maintain market vibrancy as trading continues. When market volatility is high, the risks are high since it is hard for investors to approximate precisely the future direction of their investments. This discourages investment and hence low NSE index. Regarding the influence of net cash flow on the NSE performance, the study concludes that changes in the BOP influence the stock market performance. This implies that, when making decisions on whether to invest in the NSE, investors consider the net capital flow. The findings imply that an increase in the BOP causes the stock market returns to increase which indicates the listed companies get the capability to expand productions and increase sales. This leads to increased sectors earnings for firms which results in better dividend payments for firms leading to an increase in the stock market shares.

Generally, the study concludes that interest rates, exchange rates, and BOP influence the NSE performance and can be used to predict the NSE performance. There was a strong and significant relationship between all the macroeconomic factors and the NSE performance. This implies that the macroeconomic environment in Kenya is a key determinant of business activities including the performance of equity markets.

5.3 Recommendations

The study established a statistically significant relationship between interest rates and the NSE performance. The study established that high interest rates discourage investors from taking loans and other financial institutions which generally reduces the available funds for investment. This discourages investment including the participation in the stock market. In this regard, the monetary Committee department at the CBK is recommended to maintain stable interest rates in order to encourage borrowing as would foster investment in the NSE and other sectors.

The established that exchange rate is a key determinant of the NSE performance and that investors based their investment decisions on exchange rates. This implies that high exchange rates discourage foreign investment in the country including investment in the stock market. In this regard, it is expected that the findings of this study are crucial as they provide the CBK with a rich ground that they would use to master the relationship between exchange rates and equity shares prices. This may help them employ the monetary policy tools at their disposal to maintain the exchange rates stability in Kenya and consequently averting adverse effect on the stock market. Therefore, the policy makers and the Monetary Committee department at the Central bank of Kenya are recommended to maintain a stable foreign currency exchange in order to attract foreign investors to the NSE. This would help to promote NSE performance. Also, the Security's management is recommended to develop a foreign currency denominated equity in order to minimize the effects of exchange rate fluctuations on the returns of the foreign investors. This would encourage the foreign investors to invest more hence boost the vibrancy of the stock market.

The study established a statistically significant relationship between net capital flows and the stock market performance. That is a favorable net capital flow encourages foreign investors to invest in the economy including buying stocks of the companies listed in the NSE. On the other hand, a negative and unfavorable net income portrays that the economy is no doing well which discourage foreign injection of capital in the country. This implies a huge net capital flow is desirable for the stock market to grow. In this regard, the government is recommended to ensure that relevant policies are devised and implemented in order to promote a good environment that attract capital inflow. The government is recommended to devise and

implement effective investor friendly policies that would encourage foreign investors to increase their participation in the stock market in order to promote economic growth and development.

The government is recommended to device and put in place an effective policy framework in order to create good foreign exchange market to ensure there is stability to enhance the BOP. This will help to boost confidence of the investors, attract inflow of foreign currency and in turn help to enhance investment in the stock market. Also, the government should ensure the economic environment in the country is conducive in order to promote sufficient supply of money in the economy as foreign currency denominated equity this would foster investment in the stock market and other areas.

Investors with interest in the NSE are recommended to put into consideration changes in the macroeconomic factors when making investment decisions. This is because, the study identified that the macroeconomic environment in the country are key predictors of the NSE performance.

5.4 Suggestion for Further Studies

The focus of the study was to determine the causal relationship between interest rates, exchange rates and capital flows and the stock market performance. However, there are other macroeconomic variables that influence the NSE performance. This creates the need for another study to determine other factors that influence the stock market performance. This will offer the government and stock market regulators comprehensive insights on how to regulate the market in order to safeguard the market performance.

The study covered a 30-year period that is 1989-2019. Another study is therefore recommended covering the recent 2020 data. Also, further studies should be conducted to determine the factors that influence the interest rates, exchange rates, balance of payment and

putting in consideration the influence of GDP and inflation and how it predicts stock market performance. This will help to inform the policies aimed at improving these variables in order to contribute to the NSE performance. In addition, the study was only confined to the NSE. Therefore, another study is recommended extending to other stock market in the region for comparative purposes and to offer a profound understanding on how the macroeconomic environment in a country determine the stock market performance.

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Appendix I: Data Collection sheet

Stock market performance (NSE20 Index)	1989	1990		1991	1992	1993	1994	2019
Interest Rates (Average Central Bank Rate)								
Exchange Rates (Kenya Shilling per unit US Dollar)								
Net capital flow (Balance of payments)								