EFFECT OF SELECTED MACROECONOMIC VARIABLES ON SHARE PRICES OF LISTED FIRMS ON THE NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

The research paper, to the best of my knowledge, is my original work and has not been presented for any award in any other university.

Signature ………………… Date…………………………

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The proposal has been submitted for presentation with my approval as University Supervisor.

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ACKNOWLEDGEMENT

DEDICATION

To

My entire family & Late Brother.

Thank you for your unending support.

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LIST OF ACRONYMS AND ABREVIATIONS

ANOVA- Analysis of Variance

APT- Arbitrage Pricing Theory

CAK- Competition Authority of Kenya

CAPM- Capital Asset Pricing Model

CBK- Central Bank of Kenya

CMA- Capital Markets Authority

ECM- Equity Capital Markets

GDP- Gross domestic product

IPO- Initial Public Offer

IRF- Impulse Response Function

KNBS- Kenya National Bureau of Statistics

NEPSE- Nepal Stock Exchange

NSE- Nairobi Securities Exchange

OMXS30- Stockholm Stock Exchange

VDC- Variance Decomposition

VECM- Vector Error Correction Model

VIF- Variance Inflation Factor

ABSTRACT

The stock market is essential in facilitating the exchange of financial assets by acting as a platform of convergence between buyers and sellers of securities. The Nairobi Securities Exchange is one such market. This study aimed at examining the effect of selected macroeconomic variables on share prices of listed firms on the Nairobi Securities Exchange. The studied macroeconomic variables were Interest Rate, Exchange Rate, Money Supply, Unemployment Rate, GDP and Inflation Rate. Quarterly secondary data for the period January 2007 (2007Q1) to December 2016 (2016Q4) from the KNBS, CBK as well as the NSE was used in the study to investigate the relationship. Multiple regression model was employed to analyze data in STATA. The study revealed that 72.97% of variations in share prices was explained by variations in the macroeconomic variables listed above. It was then implied that 27.03% of variations in the share prices was explained by other factors not included in the study. Share prices of firms listed in the NSE were positively affected by increases in the 91 day T-Bill rate, the GDP growth rate as well as the natural logarithm of money supply. In contrast, the share prices were negatively affected by changes in inflation, unemployment as well as the USD Exchange rates. Results of the study further revealed that a unit change in GDP would cause a positive increase in share price by 54.176 units, a unit change in the 91 Day T-Bill Rate would cause an increase in share prices by 24.598 units and a unit change in the logarithm of money supply would cause an increase in share prices by 362.680 units. The results also demonstrate that a unit change in unemployment would result to a decrease of 559.71 units in share price, a unit change in the USD Exchange Rate would cause a decrease in share prices by 40.289 units while a unit change in inflation rate would cause a decrease in share prices by 127.359 units.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The stock market provides a platform for the issuance and trade in equities and stocks of publicly listed firms. Bonds and other forms of securities are also traded in the stock market. The association involving the stock market and key macroeconomic pointers like real interest rate, exchange rate, level of money supply, inflation rate and real economic growth, among others, is paramount in analyzing the performance of the stock market. Some of these variables directly influence stock market performance either positively or negatively while others have an indirect association with the performance of stock markets (Muradoglu et al., 2000).

The Capital Asset Pricing Model (CAPM) conceptualized by Sharpe (1964), Lintner (1965) and Mossin (1966) was the first and generally acknowledged asset pricing theory. This uses one factor to explain a common stock return. The Asset Pricing Theory on the other hand is anchored on the predisposition that an asset's returns can be determined utilizing the association between many common risk factors and that same asset. It predicts an affiliation amongst the returns of a portfolio and those of a sole asset through a linear amalgamation of numerous independent macro-economic variables (Ross, 1976). Inherent in the latter theory, the association between share prices and different macroeconomic variables has been modelled thus as a linear function, showing that these variables are key determinants of stock performance. As such, this paper will be anchored on the Arbitrage Pricing Theory.

Stock prices move because of buying and selling that takes place at the stock market. At all times in the market, there are two prices that exist, namely the bid price and the ask price. It is important to identify which of these prices orders are processed at, since this is what ultimately moves the stock price. The bid price is defined as the highest publicized price a buyer posts an order to buy at, while the ask price is the lowest advertised price a seller posts an order to sell at. Any difference that exists between these two prices is referred to as the bid-ask spreads. Transactions in the market occur at a very fast pace, since people are ordering and offering at dissimilar prices, in diverse quantities, and they are at will to call off or alter their orders at any time, causing the bid and ask to change. These ultimately affect the stock prices, causing them to change in a volatile manner. Investors usually study the stock prices movements among other considerations, such as quality of the firm's workforce and commodity market situations, to ensure they make the right decisions when buying and selling stocks. This is all directed to maximize their returns from the stock market trading.

1.1.1. Selected Macroeconomic Variables

Macroeconomic variables are variables that control the macro-economy and are therefore important indicators of the wellbeing of an economy. John Maynard Keynes (1930s), an English economist, introduced macroeconomics and termed macroeconomic variables as indicators or main signposts that signal the current trends in the economy. He argued that it is necessary for governments to understand these variables, why they occur and anticipate them as well as what mixture of policy will be most suitable for curing whatever ills the economy. Brinson, Singer and Beebower (1991) describe macroeconomic variables as

factors that are significant to an economy as a whole and are able to shake a great population relatively than a select few of them. Mankiw (2014) identifies the major macroeconomic variables of interest to most financial analysts to include the gross domestic product, the broad money supply, the real rate of interest, the rate of unemployment the inflation rate and the exchange rate.

Gross domestic product (GDP) is the commonest and most preferred measure of the economic wellbeing of a nation and is defined as the market value of all end goods and services produced within the confines of a country in a specified time period. Gross Domestic Product is important as it standardizes all the economic activities that generate income or adds value using monetary units. The interest rate can be seen as the cost of using someone else's money or assets. The interest rate is usually set, through monetary policy, by the central bank of a nation, in our case, the Central Bank of Kenya (CBK). From the CBK rate, commercial banks and other financial institutions set their levels of interest rates on the various financial instruments. The level of money supply is defined as the quantity of money that circulates in an economy. It is intimately correlated with interest rate in the sense that higher interest rates result in less borrowing and consequently less money in circulation through the economy. The converse is true. In a similar way, the proportion of money supply affects the rate of inflation, in that, more money in the economy raises the inflation rate. The Central Bank makes use of the rate of interest as a monetary instrument to regulate the level of money that changes hands in the economy, and as a result, the rate of inflation as well. Higher levels of money supply leads to upsurge in the discounted rate and lowers prices of stocks (Kirui et.al. 2014).

The exchange rate is defined as the price or rate at which individuals in two different countries trade with each other. The nominal exchange rate relates to the comparative price of currencies of the two countries, while the real exchange rate relates to the relative price of goods in the two countries (Mankiw, 2014). The unemployment rate is a significant pointer that is used to measure the underutilization of labor supply in an economy (www.ilo.org). It is inversely proportional to stock market performance, in that stock prices and stock market returns fall or rise with increase or decrease in the unemployment rate. The unemployment rate is also significant as it is also a measure of the strength and wealth of an economy.

1.1.2. Stock Prices

George Weston (1989) defines stock price as the worth of the firm divided by the quantity of shares owing. He also defines it as the fiscal measure of the performance of a firm within a particular period and to the level that is viable without extraneous items during that period. The Nairobi Stock Exchange Hand Book (2005) acknowledges stock prices are the price that purchasers and sellers generate when they trade in the shares. Mwaore (2017) describes the stock price as the expected value of estimated future gains reduced by rate of return that is constant. The firm's performance determines the price of its stock. Speculation about expected cash flows and profitability of the firm influence the price that is placed on the company's stocks. The dividend is divided by the interest rate in this approach. A difference can be noted on the amount that the purchaser and seller agree to trade the stock, and the amount that a buyer is willing to pay. The former represents the stock price while the latter represents the stock's value.

Stock prices perform a very crucial part in the economy of a country, especially in financial intermediation, which involves channeling funds from excess to deficit units in the economy. This is made possible by the capital mobilization and savings allocation function of the stock market. The market, through mobilization of resources, promotes economic growth by providing long term capital though issuing of shares, stocks and other equities. For this reason, the advancement of the money market is important for economic growth.

The Equity Capital Markets (ECM) state that information on stock markets comes in a random manner, implying that it is the nature of stock prices to adjust instantaneously depending on the information. This unpredictability of stock prices causes the stock returns to be volatile. Market capitalization, which is the value of outstanding shares, and market earnings per share are greatly influenced by fluctuations in stock prices (Ali, 2011). Among other factors that affect volatility in stock prices include political environment, the company profile and the economic environment. On the other hand, stock prices are determined by such factors as the real rate of interest, the mean real rate of exchange, the real GDP, the inflation rate, rate of unemployment and the level of money supply in the economy.

1.1.3. Macroeconomic Variables and Stock Prices

In almost all the free market economies, studies done to establish the influence of macroeconomic variables, such as rate of interest, inflation rate, exchange rate, level of money supply, unemployment rate amongst others, on the stock market have yielded an inseparable and significant relationship between some of these variables and stock market performance.

Ouma and Muriu (2014), in reviewing the impact of macroeconomic variables on stock returns, found that money supply alongside the rate of inflation significantly affected stock returns at the NSE. The rate of inflation and the level of money supply are positively related, and as such an upsurge in the level of money in the economy increases the inflation rate, and this results in the dilution of stock value, thereby lowering the stock prices. Inflation rate by itself causes a reduction in demand for market instruments and the magnitude of stocks traded decline. This lowers the stock prices. Therefore, a rise in money supply in the economy as well as increased rate of inflation causes a reduction in stock performance.

The interest rate, as set by the Central Bank, determines the cost of borrowing capital for financing firms' operations. Obtaining additional funding after exhaustion of internal financial sources is inevitable for any business seeking to fund new ventures, expand its operations or even survive an economic crunch. Given that the stock prices of a firm are tied to its performance, and on the same note, it relies on loans and bonds that are subject to interest rate, then by induction, the stock prices are influenced indirectly by the interest rate as explained by Kirui et.al. (2014). By this analysis, it then follows that an increase in interest rates negatively impacts stock prices, and by extension, stock performance.

On matters exchange rate, Ma and Wenchi (1990) investigated how the stock exchange reacts to changes in the real exchange rate. In a free market economy where foreign investors can invest in the domestic market, choice of appropriate currency is of importance. Their findings were that the volatility of the currency affects the financial gain foreign investors will make on the domestic stock exchange. Further, changes in the

exchange rate of the domestic country can affect its exports by making them either competitive or non-competitive. The competitiveness of an export-oriented nation reduces when its currency appreciates, and this reduces expected returns from its stock market. Reduction in expected returns results from the fact that export firms quoted on the domestic stock market will be worse off in terms of profitability due to the currency appreciation. This shows a negative association amid exchange rate and stock market prices.

Sharma and Wongbangpo (2002) in their study recognized that there exists a positive association between the stock market and gross domestic product. Real economic output is what they actually correlated with stock returns. Increase in economic output is directly linked with increase in profitability of firms. As a consequence, the stock prices rise when expected future returns from stocks is promising. The higher a country's GDP, the better its stock performance is likely to be.

1.1.4. Nairobi Securities Exchange

The Nairobi Securities Exchange started as an association of stockbrokers in 1954. According to Ngugi and Njiru (2005) voluntary association of stockbrokers was registered under the Societies Act in what was then British Kenya. Trading in stocks began as early as 1922 when Kenya was a British colony, and such trade was limited only to the European community and was not governed by any regulations except the 'gentleman's word'.

Presently, NSE is regulated by the Capital Markets Authority (CMA) and consists of 66 listed firms. In addition, the Competition Authority of Kenya (CAK) regulates transactions in the exchange to ensure fair play among the actors. CMA approved the listing of NSE stock through an Initial Public Offer (IPO) on June 27th 2014. NSE self-lists its shares, just

as the Johannesburg Stock Exchange, on the Main Investment Market Segment. These two exchanges are the only ones in Africa that are self-listed.

Performance in the NSE has over time been affected by changes in different macroeconomic indicators. In 2016, the implementations in the interest rate capping brought about by amendments in the Banking Act led to a decline in performance. More recently, during the August 2017 general elections, the general environment negatively impacted investments in the stock markets, contributing to low performance. This clearly points to the fact that the NSE is not immune to the general macroeconomic environment.

1.2. Research Problem

It is clear that macroeconomic variables affect stock market performance. It is important to explain the sensitivity of stock prices to changes in such macroeconomic variables as real interest rate, inflation rate, exchange rate, level of money supply and real economic growth, among others and confirm if still earlier assumptions hold. An efficient market ensures maximum returns to investments. Fama (1990) stresses on market efficiency dictating share prices. According to him, market efficiency is reflected by the accuracy and speed within which macroeconomic information is attached to the stock price. This points out the importance of macroeconomic indicators in determining stock performance.

The stock market exchange, such as the Nairobi Securities Exchange, acts as a crucial market for capital, which in turn promotes economic development. Here in Kenya, the economic scene has experienced varied macroeconomic performance over time. In response to this, the NSE has undergone a number of different reforms in order to measure up to different emerging and developed markets and in the process, increase the number of

foreign investors in the stock market. The Kenyan Government has also offered different incentives with an attempt at boosting the stock market. Such incentives include granting substantial incentives to foreign investors to invest in Kenyan company shares. In addition to this, the capital market plays an important role in the economy since a lot of the companies listed in the NSE are those involved in the development of infrastructure, e.g. telecommunications, power, etc.

Many studies that have been done regarding the effect of macroeconomic indicators on stock market performance with varied conclusions. Rakhal (2015) based his study on the Nepal Stock Exchange (NEPSE) examining the effect of money supply, remittances, interest rate and exchange rate on stock performance. His conclusion was that money supply and remittances exerted a positive effect on the stock market. Exchange rate and the interest rate on the other hand had a negative effect on the stock market. Talla (2013) did a study to investigate the effect of changes in selected macroeconomic variables on stock prices at the Stockholm Stock Exchange (OMXS30) and found that currency depreciation and the rate of inflation had a noteworthy effect on stock prices, albeit in a negative association. Additionally, the interest rate insignificantly affected stock prices negatively. Money supply also insignificantly affected stock prices positively.

Kirui et. al. (2014), investigating the liaison linking selected macroeconomic variables on stock returns, established that only the exchange rate had an effect on stock returns at the NSE. The other macroeconomic variables namely GDP, inflation rate, the exchange rate and Treasury Bill rate negatively affected the stock returns at the NSE. Their findings relied on time series monthly data from the second quarter of 2000 to the second quarter of 2012. Mwaore (2017) did a similar study on NSE 20 share index and found an inverse

association between share prices and the rate of unemployment, exchange rate and the interest rate. She found out that GDP had a significant positive association with share prices of firms listed in the NSE.

With every study, both local & international, being unique in its context and scope of investigation, it is daunting to have a comprehensive view on the effect of various macroeconomic variables on stock prices. This study seeks to add to the body of existing knowledge by answering the research question; What is the impact of specific macroeconomic variables on stock prices at the Nairobi Securities Exchange?

1.3. Research Objective

To investigate the effect of selected macroeconomic variables on share prices on the Nairobi Securities Exchange.

1.4. Value of the Study

The study will be valuable for all stakeholders in the industry in theory and in practice. Actors participating in exchanges at the NSE will have additional information on the influence of specific macroeconomic variables on share prices. Such information would be useful in estimating stock performance ensuring investors make informed decisions and choosing appropriate strategies in regards to making profits from their investments.

Policy makers and regulatory bodies will find useful information on the impact of these macroeconomic variables on the stock performance to institute appropriate policies and regulations to ensure effective trading at the exchange as well as strengthen stock market stability going forward.

The general public will also benefit from the study by enhancing their understanding and knowledge of key macroeconomic factors and their effect on stock market performance. Further, future research on this field will gain insights from this paper to inform their study and improve or vary their methodology.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter puts into perspective the purpose of this study by reviewing theories and empirical studies relating to macroeconomic variables and share prices. Past studies both locally and globally will act to inform this study and point to the expectations of this study.

2.2 Theoretical Review

Two theories have been selected to link the impact of macroeconomic variables on stock prices. They are discussed below:

2.2.1 Arbitrage Pricing Theory

Proposed by Ross in 1976, the Arbitrage Pricing Theory is a multi-factor model which assumes that a linear relationship between the security's expected returns and a number of macroeconomic variables that represent systematic risk, can be used to estimate the asset's return. As such, this is the anchoring theory for this study. The Arbitrage Pricing Theory (APT) is a better form of CAPM, since the latter only relies on one factor namely, market risk. Arbitrage Pricing Theory considers a number of different factors for pricing securities. Due to the existence of different sources of risks, the model seeks to measure risk premiums related to each type of risk. Diversification of investment portfolio cannot reduce the risk on return to investment since the Arbitrage Pricing Theory factors are systematic risk.

The expected return on security is determined by a risk-free rate plus the risk premium associated with each macroeconomic factor in collaboration with the sensitivity of the asset price of each particular macroeconomic factor. The multifactor model usually has four to five factors that explain a good proportion of an asset's return. The model is linear in nature.

This model is useful in valuing securities in addition to identifying those that are temporarily priced incorrectly, allowing for value investing. In using the model, different investors may choose different factors that are related to a particular stock's return resulting to different valuations of the same stock. This presents one of the criticisms directed at Arbitrage Pricing Theory model apart from the lack of guideline on how many factors should be included in the model. Despite the criticisms, the Arbitrage Pricing Theory model stands out as the best to base this study on. The model allows input of a number of macroeconomic factors that influence share prices to be examined.

Chen.et.al (1986) in their study used inflation rate, GDP and rate of unemployment as systematic variables in investigating their effect to NSE shares prices.

The systematic factors selected for this study include the interest rate, exchange rate and money supply.

2.2.2 Capital Asset Pricing Model

Developed by Sharpe (1964) and Lintner (1965, 1969), Capital Asset Pricing Model (CAPM) is a single-factor model used in asset pricing to investment risk and the rate of return to be expected in regards to securities. The model takes into consideration two types of risks in returns to individual investments. Systematic risk are risks that affect the general

state of the economy viz. financial markets, and are considered market risks. Recessions, alterations in the interest rate, political uncertainty and natural disasters are some examples of systematic risk affecting investment portfolio.

On the other hand, unsystematic risk are risks that are specific to the individual investment portfolio, such as efficiency of a company's workforce. This type of risk is in no way correlated to market risks and is sometimes termed as specific risk. Unlike the systematic risk, unsystematic risk can be diversified in the sense that an increase in the amount of investment portfolio will reduce the specific risk.

William Sharpe documented the formula for CAPM that equates the cost of capital to the return on individual stock. The CAPM model explains that the return expected of a portfolio or a security is equivalent to the rate on a risk-free security added to a risk premium. If this anticipated return doesn't meet the required return, then the investment should be ignored. The results of the CAPM for all different risks (betas) are plotted by the security market line. The risk-free rate is the rate of return on a security with zero risk such as long term Treasury bonds. The beta as a measure of stock's risk takes into account the stock's volatility relative to that of the stock market. This model is useful when considering a single factor, market risk. The idea behind this model is that the risk and time value of money are the ones the investor should be compensated. The risk-free rate compensates the time value of money, and beta compensates the risk. Most critics argue that beta is not sufficient when it comes to explaining asset returns, claiming there are other factors that fix prices of stocks.

2.2.3 Macroeconomic Approach

While using factor analysis to determine the factors affecting asset returns, a number of scholars have measured economic factors with an attempt at explaining stock returns. Such studies have shown that interest rates are associated with risk premiums. The interpretation of this observation has been linked with changes in inflation rates, as evidenced by Fama (1977) who argues that changes in the rates of inflation are fully reflected in interest rates. Therefore, this approach aims to look at how sensitively the prices of stock changes in relation to such macroeconomic variables. It states that stock prices are predisposed to changes in rate of interest, money supply, inflation and other indicators.

2.3 Determinants of Share Prices

Share prices are determined by a number of macroeconomic factors with the most important ones being the unemployment rate, money supply, GDP and inflation rate as documented by Shiblee (2009). Most studies disagree to the level and magnitude of various macroeconomic variables on share prices, and the reason for the discourse is that each study is distinctive in terms of the context and time period it is conducted. However, some macroeconomic factors stand out in influencing share prices, and they include GDP, rate of inflation, rate of interest, money supply and unemployment rate. Junkin (2012) stresses that these macroeconomic factors grant the investor tools to monitor and forecast the economic environment in which they have invested in as these factors determine the behavior of the stock market.

2.3.1 Interest Rate

The interest rate can be viewed as the cost of capital, that is, the amount paid for using someone else's money for a time period. This amount is the price for the borrowed money, and from the perspective of the borrower, the price is the borrowing rate. From the lender's perspective, the interest rate is the lending rate.

In an inefficient market, which is the real-world situation, when the rate of interest paid to depositors by bank decreases, individuals will move their capital from the bank to the share market. As a result, the demand for equity share increases and consequently the share price will increase. The converse is also true. Alam & Uddin (2009) explain another way in which the share prices will increase as a result of decrease in interest paid to depositors by banks. The lending interest rate decreases with decrease in interest paid to depositors leading to an increase in economic investments. Increase in investments in the economy results in profitability of firms and increase in their share prices. Thus, an inverse association exists between the interest rate and share prices in theory.

The interest rate has been found to significantly influence share prices drawing empirical evidence from several studies such as Kirui et.al. (2014), Adam & Tweneboah (2008), Alam & Uddin (2009), Mwaore (2017). The 91-Day Treasury Bill rate from Central bank of Kenya hit an all-time high at quarterly average of 19.53% in the first quarter of 2012 since the late 1990s. this average was driven up mainly by January's 20.56% and February's 19.7% rates. The third quarter of 2010 recorded one of the lowest the lowest quarterly average 91-Day T-Bill rate in Kenya's history.

2.3.2 Exchange Rate

The exchange rate can be termed as the price at which a country's currency can be traded with another county's currency. The real exchange rate is the relative price of commodities in two countries while the nominal exchange rate refers to the price of a nation's currency relative to that of another nation.

In practice, most currencies are expressed in terms of the domestic currency to the United States Dollar. Kirui et. al. (2014) discussed the exchange rate where they observed that the Kenyan Shilling to the United States Dollar average exchange rate hit triple digits as at the start of the third quarter in 2015. During the period from 2007 to 2016, the shilling depreciated to the dollar to hit a high of 105.27 on September 2015. Since then, the shilling has maintained triple digits till date but remaining fairly stable.

Bailey and Chung (1995) carried out a study on political risk, exchange rate fluctuations and stock returns at the Mexican stock market and recognised a positive association between exchange rate changes and stock market return volatility.

2.3.3 Money Supply

Money supply implies to the money circulating in the economy at a point in time. The Central Bank controls the level of money supply through various instruments with the main ones being selling and buying of government Treasury Bills and Bonds. Depending on policy objectives, the Central bank puts more money into the economy by buying monetary instruments and reduces the amount of money circulating in the economy by selling these monetary instruments.

Most economists argue that increase in money supply results to increase in stock returns. The logic is that more money results to lower lending rates and individuals will consume industrial goods which they would otherwise not purchase when broke. Increased demand leads to increased economic activities and translates to increased profits by firms. Share prices are directly linked to firms' profitability, and thus share prices will rise. Similarly, as Maskay (2007) put it, speculation about increase in money supply is enough to increase share prices. Share prices are determined by the present value of future cash-flows. Since the discount rate is significantly associated with money supply hence the future cash flows, money supply influence share prices.

2.4 Empirical Studies

Kuwornu (2012) conducted an effects study of four macroeconomic variables on the Ghanaian stock market. He sought to investigate the effect of crude oil prices, exchange rate, 91-day Treasury Bill rate and the inflation rate on stock returns on the Ghana Stock Exchange. The study relied on monthly data spanning 17 years from 1992 to 2008, and on Johansen Multivariate Co-Integration Analysis. The findings were presented both in the short term and in the long term. In the short run, the inflation rate and Treasury Bill rate significantly affected stock returns, and both exhibited a negative association with stock returns. On the other hand, in the long-term crude oil prices, the exchange rate, the inflation rate and Treasury Bill rate and significantly affected stock returns in the Ghana Stock Exchange. Investors are compensated as a result of the interest rate being positively related with stock returns in the long term. The interest rate stood out as a significant variable affecting stock returns both in the long term and in the short term. This study, nevertheless,

establishes no significant relationship between stock returns and crude oil prices. In addition, it was unable to specify which specific variables have a uni or bi-causal relationship with stock returns in Ghana.

A study done in South Asia by Gunasekarage et. al. (2004) to look at the influence of macroeconomic variables on equity values in the Sri Lanka's stock market made use of co-integration, impulse response functions (IRFs), unit root tests, variance decompositions (VDCs) and vector error correction models (VECM) in their analysis of data collected over 17 years from 1985 to 2001. The variables investigated included the exchange rate, Treasury Bill rate, money supply and consumer price index (as a proxy for inflation). IRF function established that the effect of the macroeconomic variables on the stock market was immediate. The level of money supply, the inflation rate and the Treasury Bill rate significantly affected stock market equity values as revealed by the VECM model. The results showed that Treasury Bill rate had a negative effect on stock prices. The exchange rate had an insignificant influence on stock prices. The Treasury Bill rate and money supply exhibited the strongest influence on stock price movements on the Colombo Stock Exchange. While this study was a pioneer in the Sri Lankan context, it has been critiqued as weak based on the methodologies adopted, which have cast aspersions on the validity of the test results.

Fama (1981) found, in his investigation on whether there exists any association amid macroeconomic variables and stock returns, that capital expenditures, gross national product and induction production had a strong influence on equity returns. The results of his study showed that the association that existed between these macroeconomic variables and stock returns was positive. Sharma & Wongbangpo (2002) agreed with these findings

with their study concluding a strong positive relationship between economic output growth and stock returns.

Rakhal (2015) documented that money supply and remittances exerted a positive effect on the Nepal Stock Exchange (NEPSE). In contrast, the exchange rate and the interest rate had a negative influence on the stock exchange. The study proposed that if substantial proportion of remittances is invested in stocks, stock market performance will improve. He also viewed that stock market performance will also improve given an increase in the level of money supply.

Using monthly data from 2001 to 2015, Kotha & Sahu (2016) investigated the long run and short run relationships that exist between specific macroeconomic variables and equity market returns in the Indian market, BSE Sensex. They examined exchange rate, Treasury Bill rate (as proxy for interest rate), money supply (M3) and whole sale price (as a proxy for inflation). Using error correction model (ECM) and Johansen's co-integration analysis, one co-integrating factor was detected amid the stock market and the four macroeconomic indicators. The outcome also revealed that money supply, wholesale price and Treasury Bill rate were significantly related with Sensex in the long term. Money supply and inflation exhibited a positive and significant relation with equity returns while the interest rate insignificantly affects stock returns negatively.

Maskay (2007) did an empirical study analyzing whether changes in money supply has any influence on share prices. The results showed that money supply is significantly and positively related to stock prices. These findings are in line with real activity school of thought which prescribes that an increase in money supply increases the level of economic activity and consequently increases share prices. The converse is also true. GDP as a

control variable was found to be positively associated with share prices, while unemployment rate had an inverse relationship with share prices. Maskay concluded that due to the stock market responding favorably to a raise in the level of money supply, policy makers should be aware and conscious of their expansionary fiscal policies to increase economic output and decrease the rate of unemployment.

Kirui et. al. (2014) investigating the association amid selected macroeconomic variables on stock returns established that only the exchange rate had an effect on stock returns at the NSE. The other macroeconomic variables namely GDP, Treasury Bill rate, inflation rate,. The exchange rate negatively affected the stock returns at the NSE. Their findings relied on time series monthly data from the second quarter of 2000 to the second quarter of 2012.

Makori (2017) in her paper assessing the impact of exchange rates on stock returns at the NSE, concluded that the real exchange rate had a significant relationship with stock performance. Real exchange rate positively influenced stock returns at the NSE. Her findings also noted that inflation rate has a negative relationship with stock returns. Mwaore (2017) did a similar study on NSE 20 share index and found an inverse connection between share prices and the rate of unemployment, exchange rate and the interest rate. She found out that GDP had a significant positive association with share prices of firms listed in the NSE.

2.5 Summary of the Literature Review

The theoretical framework provided the theoretical foundations on which this study will be based on showing how the various macroeconomic variables relate with share prices and how they are expected to influence share prices. The empirical studies have provided

evidence on how these variables have affected stock prices in different contexts and time periods. Global and local studies have provided varying results on the magnitude and level of influence of various macroeconomic variables on share prices. There is inconclusiveness in some of the empirical studies discussed above, both locally and at the global stage, as evidenced by Kuwornu (2012). Similarly, there has also been questioning of some of the methods employed in others, such as Gunasekarage et. al. (2004) For this reason, there is need to carry out this study, employing other variables in addition to the ones tested in the studies above, with an attempt at determining their effect on share prices and stock performance. However, while the conclusions are varied, most of the empirical studies agree that in one way or the other, macroeconomic indicators cannot be overlooked when it comes to share prices and stock market performance.

2.6. Conceptual Framework

A conceptual framework is a pictorial presentation of how the variables or interest are linked to each other. The interest rate, exchange rate and the money supply comprise the independent variables, while the controlled variables is the unemployment rate. The NSE 20 share index represents the dependent variable. These are all incorporated in the regression model to find out the relationship that exist between the independent and the dependent variables.

Figure 1: Conceptual Model

INDEPENDENT VARIABLE

Interest Rate

Exchange Rate

Money Supply

CONTROL VARIABLE

Unemployment Rate

GDP

Inflation Rate

DEPENDENT VARIABLES

Share Prices-NSE 20 Share index
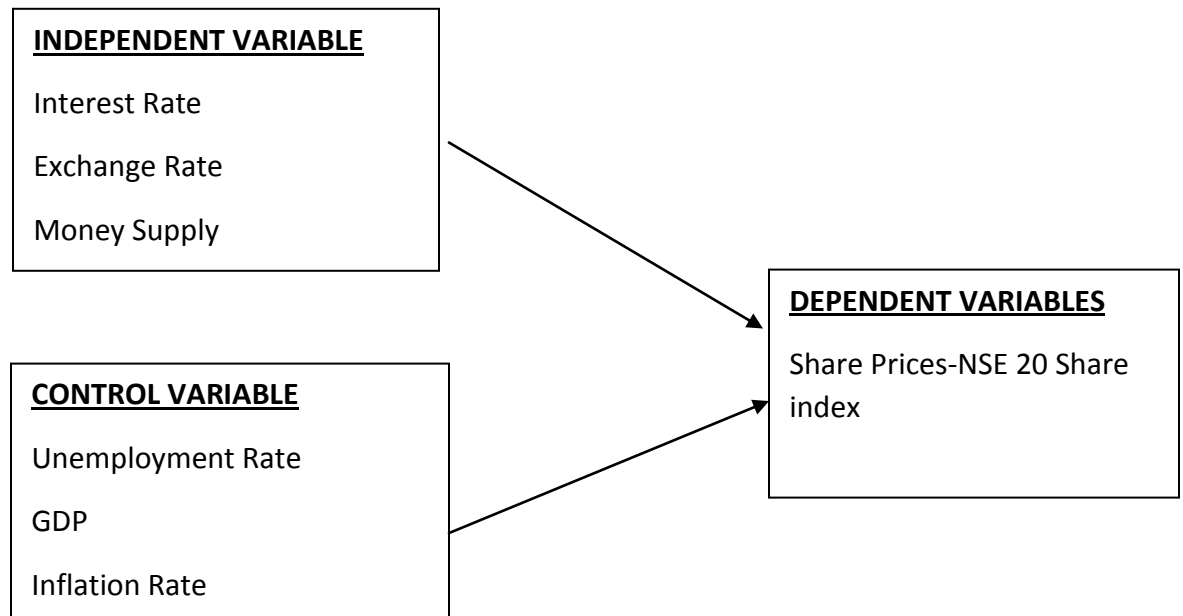
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter reviews the methods used to collect and analyze the data used for the study, the population of the study and sample selection, as well as the development of the models necessary for the realization of the research intentions.

3.2 Research Design

The study used a descriptive research design. The descriptive research design is defined as one used to obtain information on a phenomenon by describing what exists with respect to variables or conditions in a situation. This approach was considered appropriate because of its comprehensiveness in data collection and analysis and its ability to capture the objective of the study. The focus was on linking the variables being studied.

A descriptive research design was used in the study to investigate the connection between selected macroeconomic variables and share prices of the firms listed on the NSE 20 Share Index. The study covered a period of ten years from the first quarter of 2007 to the last quarter of 2016. The study used multivariate regression analysis to examine the relationship between the share prices and selected macroeconomic variables.

3.3 Population

The target population for the study was the NSE 20 share index companies listed on the Nairobi Securities Exchange. The 20-share index is a price weight index calculated as a mean of the top 20 best performing counters. This was recently reviewed, incorporating,

among others, the inclusion of Nairobi Securities Exchange PLC as index constituent companies.

3.4 Sample

The study used the entire population as its sample. The NSE 20 share index companies are the largest in terms of market capitalization at the NSE. They represent the most profitable firms in the country and can be considered as the movers and shakers. These 20 firms are a representative of all the publicly listed firms at the NSE as they represent every segment listing at the NSE, having been drawn from the commercial services, banking, manufacturing, energy & petroleum, insurance, telecommunications & technology, investment and investment services sectors. With this regard, the study used the NSE 20 Share index as its unit of analysis.

3.5 Data Collection

The study collected secondary time series data from authentic sources. All variables' data were time series in nature spanning from the first quarter of 2007 to the last quarter of 2016. The sources of secondary data included the Kenya National Bureau of Statistics (KNBS), the Central Bank of Kenya (CBK), and the Nairobi Securities Exchange (NSE). The NSE 20 Share Index was used as a measure of share prices. 91-Day Treasury Bill rate was used as an interest rate proxy. Inflation rate, exchange rate in terms of the US Dollar, the rate of unemployment and money supply (M3) were used as the independent and control variables alongside the interest rate.

3.6 Data Analysis

The study made use of a multivariate regression model to investigate the association amid share prices and selected macroeconomic variables. The analysis was done using STATA 12/IC software.

3.6.1 Analytical Model

The Arbitrage Pricing Theory informed the model specification for this study to investigate the liaison between share prices and the chosen macroeconomic variables. Share prices was expressed as a function of the macroeconomic variables as shown:

$$Share\ prices = f(Interest\ rate, Exchange\ rate, Level\ of\ Money\ supply, Unemployment\ rate, GDP, Inflation)$$

The multiple regression model used is given below:

$$SP = \beta_0 + \beta_1 lnINTR + \beta_2 lnEXCR + \beta_3 lnLMS + \beta_4 lnUNER + \beta_5 lnGDP + \beta_6 lnINFR + \varepsilon$$

Where;

$ln = Natural\ log$

$\beta_0 = Intercept$

$SP = Quarterly\ Share\ Prices, which\ is\ measured\ by\ the\ NSE\ 20\ share\ index\ (Quarterly\ Share\ Price\ is\ obtained\ from\ 3\text{-}month\ Average\ Share\ Price)$

$INTR = Interest\ Rate$

$EXCR = Exchange\ Rate\ (USD\ Mean\ Exchange\ Rate)$

$LMS = Level\ of\ Money\ Supply$

$UNER = Unemployment\ Rate$

$GDP = Gross\ Domestic\ Product\ (Natural\ log)$

$INFR = Inflation$

$\varepsilon = Stochastic\ Error\ Term$

$\beta_n = Regression\ Coefficient$

For a unit change in one explanatory variable, holding all the other explanatory variables fixed, results to a mean change in the dependent variable which is represented by the regression coefficient (Gujarati, 2009). A larger value of the regression coefficient translates to a larger mean change in the response variable.

3.6.2 Diagnostic Tests

Analysis of variance (ANOVA) and correlation analysis was conducted to establish the level and direction of association between the variables. Variance inflation factor (VIF) test was done to check for existence of multicollinearity. Presence for heteroscedasticity was tested using Breusch-Pagan-Godffrey test.

3.6.3 Tests of Significance

Correlation coefficient (r) was useful in measuring the magnitude and direction of linear association between any two variables in our model, in particular share prices and any other macroeconomic variable. The coefficient of determination (R^2) was used to establish to what extent changes in share prices were attributed to changes in the selected macroeconomic variables. ANOVA was used to test, using F-statistic, the overall fitness of our analytical model.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis carried out in this study, the findings and their interpretation. The selected macroeconomic variables investigated to show their effect on share prices at NSE included the inflation rate, the 91-Day Treasury Bill rate, the exchange rate, GDP, unemployment rate and the level of money supply. Share prices were represented by NSE 20 Share Index. Secondary data used was obtained from the World Bank, the Central Bank of Kenya, NSE and KNBS. Analysis was done through correlation analysis, descriptive statistics and regression analysis.

4.2 Descriptive Analysis

This section show cases descriptive statistics of the variables of interest in this study in addition to showing tends of the variables within the period they were collected; Between the First quarter of 2001 to the Fourth quarter of 2016.

Table 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Average Inflation rate	40	8.25075	3.895945	4.033333	16.83333
91-Day T-Bill rate	40	8.426167	3.321714	1.823333	19.35333
Unemployment rate	40	11.793	.5029972	11	12.8
USD mean Exchange rate	40	84.04352	11.04978	62.953	102.9667
GDP average growth rate	40	5.4	2.344552	.2	12.4
LnM3	40	13.99561	.8316016	10.40038	14.81571
NSE 20 Share Index	40	4252.172	771.5473	2826.23	5431.77

Source: Research findings

The study revealed that the USD exchange rate registered the second largest standard deviation at 11.05 after the NSE 20 Share Index. The mean exchange rate for the period under study was 84.04. The 91-Day Treasury Bill rate had a mean of 8.43 and a fairly stable variation from the mean. The natural logarithm of the level of money supply (ln M3) had a standard deviation of 0.83 and a mean of 14.0, signaling a sound policy to keep the level of money supply stable over the period. NSE 20 Share Index had the largest standard deviation at 771.55.

Figure 2: Graphical plot of NSE 20 Index Share Price (2007Q1 to 2016Q4)
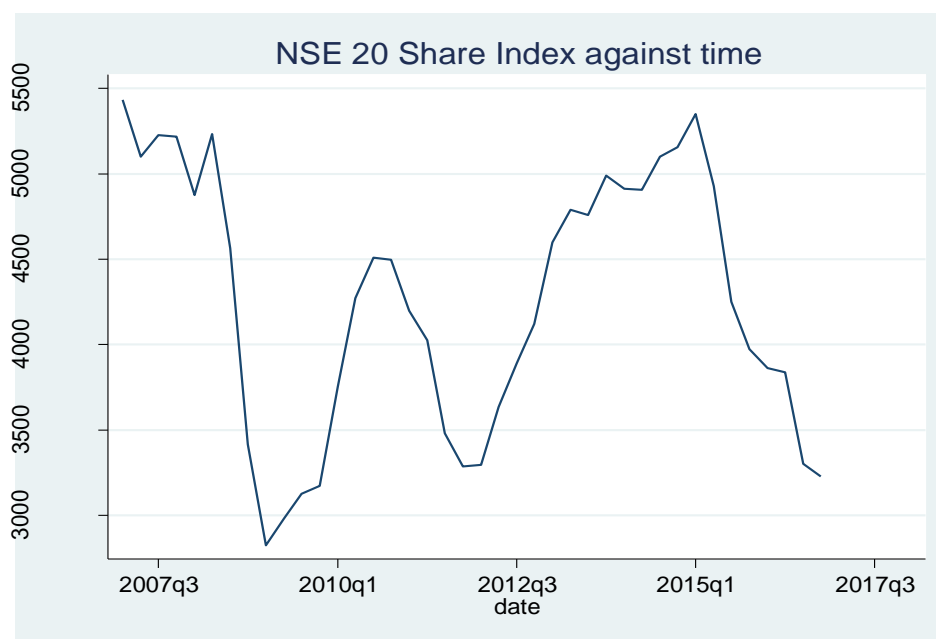
Source: Research findings

The share prices fell drastically after the election period of 2007/8 as a result of the political tension during that period as shown in Figure 1. The first quarter of 2007 registered the highest share price index within the period under study standing at 5431.77.

Figure 3: Graphical plot of the Average Inflation Rate (2007Q1 to 2016Q4)
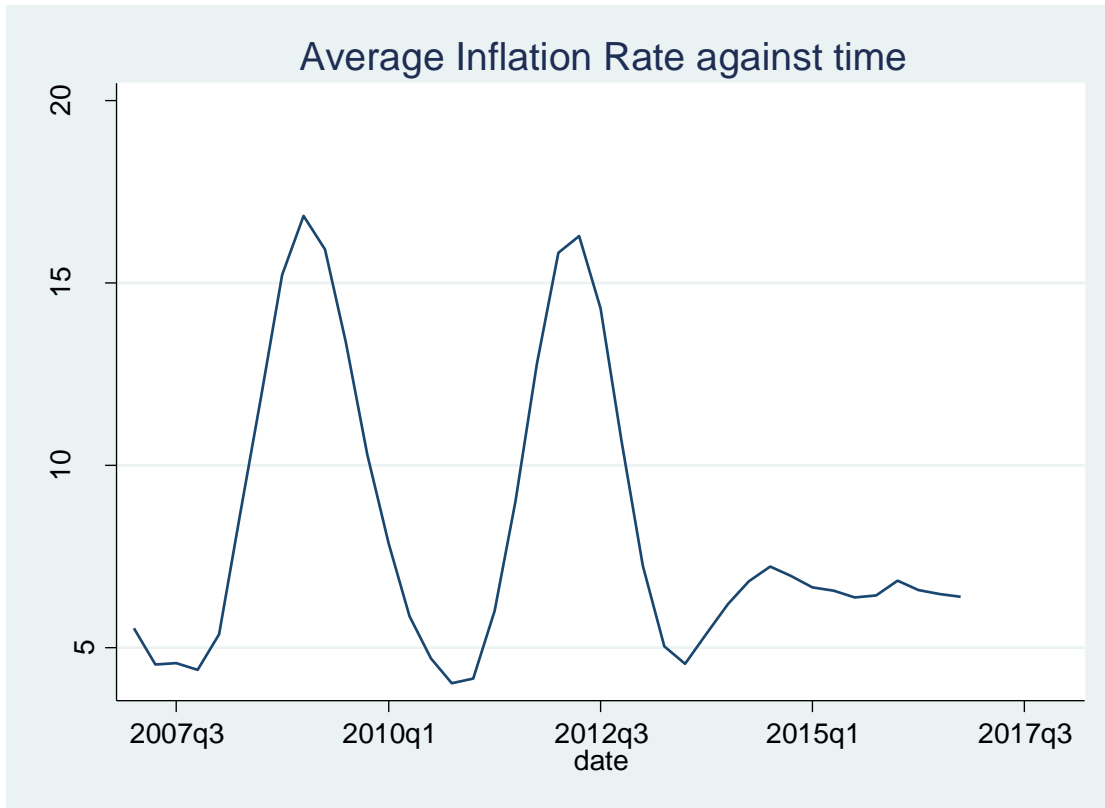
Source: Research findings

The average rate of inflation had a mean of 8.25% and a standard deviation of 3.90%. From

Figure 2, the highest rate of inflation was 16.83% in the first quarter of 2009. The rate hit a

minimum of 4.03% in the last quarter of 2010. A cyclical pattern can be induced from the

graph.

Figure 4: Graphical plot the 91-Day Treasury Bill Rate (2007Q1 to 2016Q4)
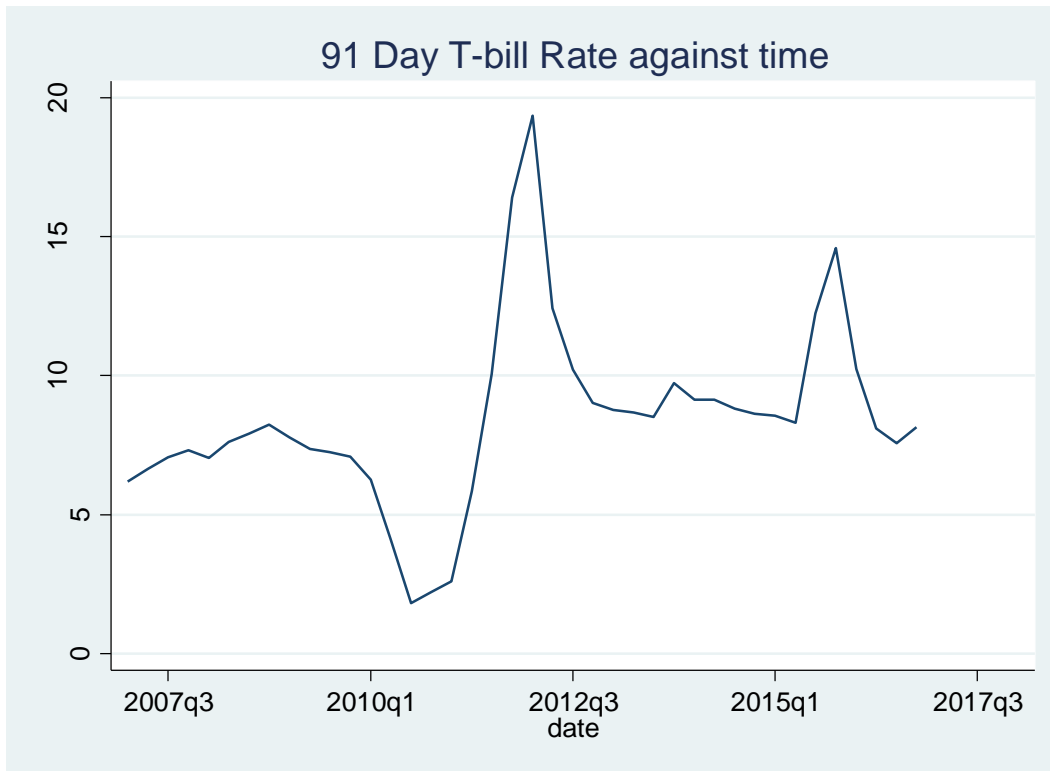
Source: Research findings

The 91-Day Treasury Bill rate hit a high of 19.35% in the first quarter of 2012 as shown in Figure 3, having come from an all-time low of 1.82% as at the end of the third quarter of 2010. The rate averaged at 8.43% with a standard deviation of 3.32%.

Figure 5: Graphical plot of the Unemployment rate (2007Q1 to 2016Q4)

Source: Research findings

Figure 4 reveals that the unemployment rate reached a maximum value of 12.8% and a minimum rate at 11%. These rates were achieved in 2010 and 2016 respectively. The unemployment rate averaged 11.79% with standard deviation of 0.50%.

Figure 6: Graphical plot of USD Exchange rate (2007Q1 to 2016Q4)
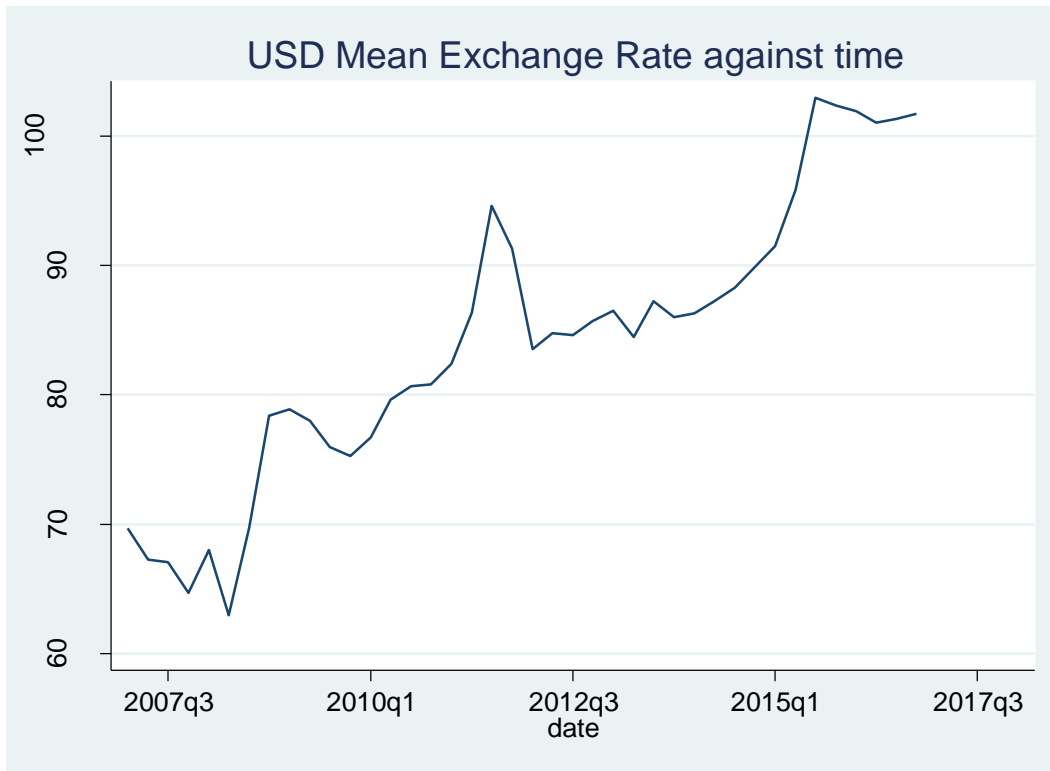
Source: Research findings

The USD exchange rate was found to be constantly rising within the period as depicted by Figure 5. A maximum rate was attained at 102.97 at the end of the third quarter of 2015. The minimum rate of exchange within the period under study was 62.95. The exchange rate averaged at 84.04 within this period.

Figure 7: Graphical plot of GDP Growth rate (2007Q1 to 2016Q4)

GDP Average Growth Rate against time
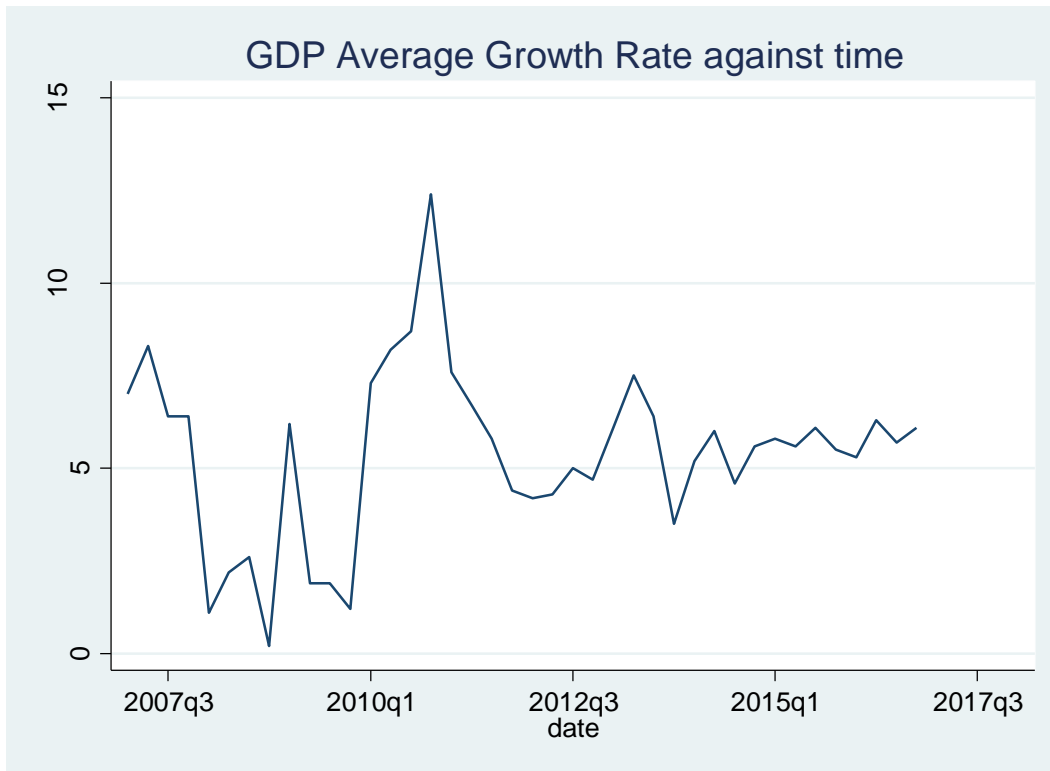
Source: Research findings

Figure 6 reveals that the highest level of growth in GDP was experienced at the end of the last quarter of 2010. This maximum rate of growth was at 12.4%. The last quarter of 2008 experienced the lowest rate of growth within the period being at 0.2%.

Figure 8: Graphical plot of the Level of Money Supply (2007Q1 to 2016Q4)
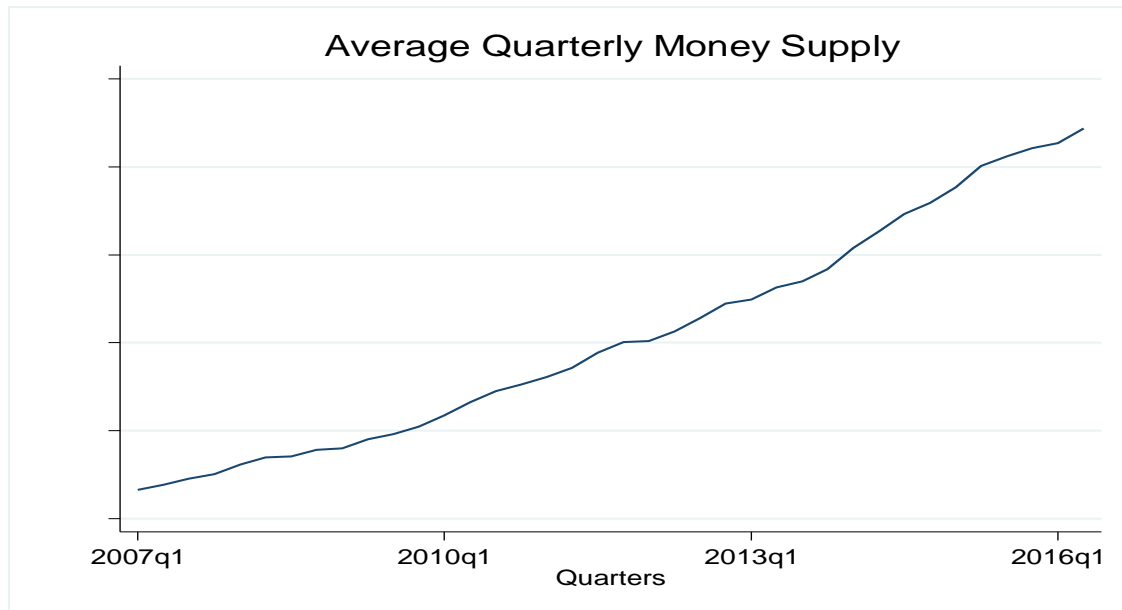
Source: Research findings

The level of money supply was found to have a consistent upward trend over the period as shown by Figure 7. The lowest amount of money supply was 664853.33 million Kenya shillings with the highest being 2718826.667 million Kenya shillings. This was found in the first quarter of 2007 and the second quarter of 2016 respectively.

4.3 Correlational Analysis

Table 2 shows the output from correlation analysis between the variables. Pearson's correlation was employed to ascertain the relationship that exists between the variables under investigation.

Table 2: Correlation Matrix

		NSE 20 Share Index	Inflation rate	91-Day Treasury Bill rate	Unemploy ment rate	USD Exchange rate	GDP growth rate	Ln M3
NSE 20 Share Index	Correlation	1.0000						
	Sig. level							
	No.	40						
Inflation rate	Correlation	-0.6679*	1.0000					
	Sig. level	0.0000						
	No.	40	40					
91-Day Treasury Bill rate	Correlation	-0.2551	0.4527*	1.0000				
	Sig. level	0.0890	0.0034					
	No.	40	40	40				
Unemployment rate	Correlation	-0.1314	0.0521	-0.3570*	1.0000			
	Sig. level	0.1007	0.7561	0.0278				
	No.	40	40	40	40			
USD Exchange rate	Correlation	-0.2951	-0.0477	0.4244*	-0.2093	1.0000		
	Sig. level	0.2073	0.7761	0.0079	0.2072			
	No.	40	40	40	40	40		
GDP growth rate	Correlation	0.2710	-.05669*	-0.3594*	0.4321*	0.1560	1.0000	
	Sig. level	0.0655	0.0002	0.0267	0.0068	0.3496		
	No.	40	40	40	40	40	40	
Ln M3	Correlation	0.2710	-0.1573	0.3976*	-0.2432	0.9181*	0.1400	1.0000
	Sig. level	0.7979	0.3457	0.0134	0.1412	0.0000	0.4018	
	No.	40	40	40	40	40	40	40

Source: Research findings

The rate of inflation, as seen in Table 2, had a negative significant association on the share price. * signifies that the variable is significant at 0.05 significance level. The rest of the variables are insignificantly correlated with share prices at 5% level of significance. The 91-Day T-Bill rate, the unemployment rate and the USD exchange rate are negatively correlated with share prices although the relationship is weak. GDP growth rate and money supply also exhibited a weak relationship with share prices albeit a positive one.

4.4 Diagnostic tests

4.4.1 Test for Heteroscedasticity

When the stochastic error terms do not exhibit constant variance, then heteroscedasticity arises. Table 3 shows the test results for heteroscedasticity.

Table 3: Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Homoskedasticity
H$_1$: Heteroskedasticity
Variables: fitted values of NSE 20 Share Index
chi2(1)   =   0.24
Prob > chi2 = 0.6268

p-value: $0.6268_{calculated} > 0.05_{critical}$

The p $_{calculated}$ is greater than the p $_{critical}$, and we cannot reject the null hypothesis of homoscedasticity, hence we have constant variance in our model.

4.4.2 Multicollinearity test

When the stochastic error terms in a regression model exhibit perfect or imperfect correlation, then the model suffers from multicollinearity. Table 4 gives results of the Variance Inflation Factors (VIF).

Table 4: Multicollinearity

Variable	VIF	1/VIF (Tolerance)
Ln M3	1.24	0.808180
USD Exchange rate	1.56	0.640976
Inflation rate	2.31	0.433348
GDP growth rate	2.43	0.411335
91-Day T-Bill rate	1.99	0.501483
Unemployment rate	2.09	0.479287
Mean VIF	1.94	

Taking the rule of thumb that classifies any VIF greater than 10 to represent severe multicollinearity, our test shows that none of the variables exhibited VIF greater than 10. This implies that there was no severe multicollinearity in the model used.

4.5 Inferential statistics

Table 5: Model Summary

R-Squared	Adjusted R-Squared	F (6,33)	No. of observations
0.7713	0.7297	18.54	40

The coefficient of determination (R^2) is given as 0.7713 and adjusted R^2 is 0.7297. The implication is that approximately 72.97% of variations in share prices are actually explained by variations in the regressor variables.

Table 6: Analysis of Variance (ANOVA)

Source	Sum of Squares	Df	Mean square	F	Sig.
Regression	17905542	6	2984257	18.54	0.0000
Residual	5310582.11	33	160926.731		
Total	23216124.1	39	595285.233		

To test for the goodness of fit of our model, we make use of the F-statistic. Since the p-value $_{calculated}$ 0.0000 is less than the p-value $_{critical}$ 0.05, we conclude that the regressor variables are jointly significant at 5% significance level.

Table 7: **Regression Results**

	Coefficient	Std. Error	t-value	P>t	Lower Bound CI	Upper Bound CI
Inflation rate	-127.3594	25.04669	-5.08	0.000	-178.3173	-76.40153
91-Day T-Bill rate	24.59834	27.3081	0.90	0.374	-30.96041	80.15708
Unemployment rate	-559.7053	184.4669	-3.03	0.005	-935.006	-184.4046
USD Exchange rate	-40.28853	7.261181	-5.55	0.000	-55.06151	-25.51554
GDP growth rate	54.17607	42.71929	1.27	0.214	-32.73699	141.0891
Ln M3	362.6796	85.92358	4.22	0.000	187.8668	537.4925
Constant	9713.834	2164.077	4.49	0.000	5310.987	14116.68

Focusing on the p-values, a parameter is considered significant only when its p-value $_{calculated}$ is less than the p-value $_{critical}$. Similarly, using t- distribution, a parameter is significant when the t $_{calculated}$ is greater than the t $_{critical}$. In this case from Table 7, all the regressor variables have p values less than 0.05 (p-value $_{critical}$) except for the 91-Day Treasury Bill rate and the GDP growth rate. This implies that the 91-Day T-Bill rate and the GDP growth rate are insignificant in determining the stock performance. The regression coefficients show the degree and direction of the specific regressor variable relationship with the share price.

4.6 Discussion of Research Findings

The share price had an average of 4252.17 within the period under study. The descriptive statistics also reveal that the share price reached a maximum amount of 5431.77 and a low of 2826.23. This was within the standard deviation of 771.55. The rate of inflation had a mean of 8.25 and a standard deviation of 3.90. The 91-Day T-Bill rate averaged 8.43 with a standard deviation of 3.32 within the period. Similarly, unemployment rate had a mean and standard deviation of 11.79 and 0.50 respectively. USD exchange rate averaged 84.04 with 11.04 standard deviation, the GDP growth rate averaged 5.4 with 2.34 standard deviation and the natural logarithm of money supply averaged 14.00 with a standard deviation of 0.83.

Pearson's correlation coefficient reveals that the inflation rate, unemployment rate and the USD exchange rate were inversely related to share prices. These findings are all in line with most empirical studies discussed in chapter two. In addition, GDP growth rate, the 91-Day T-Bill rate and money supply were found to be positively related to variations in share prices. This again agrees with most findings in empirical studies.

Regression analysis revealed a coefficient of determination of 0.7713 and an adjusted coefficient of determination of 0.7297, implying that approximately 72.97% of variation in share prices at the NSE can be attributed to the influence of the macroeconomic variables investigated in this study: inflation rate, 91-Day T-Bill rate, unemployment rate, USD exchange rate, GDP growth rate, and money supply. The remaining 27.03% represent the influence of other variables, not used in this model, on share prices.

ANOVA resulted in an F-statistic calculated of 18.54. F-statistic critical of 2.41 used 6 numerator degrees of freedom and 33 denominator degrees of freedom and 5% level of significance. The F calculated exceeded the F critical and the conclusion was that the model was a good fit for the data. Similarly, taking a look at the p-values we find that the p-value calculated of 0.00 is less than the p-value critical of 0.05 at 5% level of significance. We conclude that the model is a good fit.

The regression coefficients gave the direction of influence and measure of the regressor variables on the dependent variable. The findings revealed that a unit increase in the inflation rate would significantly lead to a 127.36 decrease in share prices. Similarly, a unit increase in the exchange rate would significantly result to a 40.29 decrease in share prices. A unit increase in the unemployment rate would significantly result to a 559.71 decrease in the share prices. This effect is notable, due to its magnitude, among variables that inversely affect the share prices. The interest rate, represented by the 91-Day T-Bill rate, affects the share prices positively. A unit increase in the interest rate would result to a 24.60 increase in share prices. However, the effect of interest rate on share prices is insignificant. 54.18 significant increase in share prices would be caused by a unit increase in the GDP growth rate. Money supply significantly affect share prices with a unit increase resulting to a 362.68 increase in the share prices.

The inflation rate significantly influenced NSE share prices at 5% level of significance from the findings. This finding is in line with the results of a paper done by Okech & Mugambi (2016). However, their findings contrasted with this study in that inflation rate positively influenced stock returns. Kotha & Sahu (2016) also found inflation to have a

positive significant effect on equity market returns on the BSE Sensex. Babu (2017) also found inflation to be significant in affecting stocks returns at the NSE.

The interest rate proxied by the 91-Day Treasury Bill rate was found to insignificantly affect stock prices at the NSE. This is in line with the findings of Kotha & Sahu (2016) where they found that the interest rate in the short-run insignificantly affected stock returns. The relationship between interest rate and stock returns was established as being inverse in contrast with our finding. However, in the long run interest rate was found to be significant in influencing share prices. Mumo (2017) agrees that the interest rate positively affects share prices at the NSE, albeit significantly.

Unemployment rate was found to be significant in influencing share prices at the NSE in this study. The nature of the relationship was an inverse one. Mwaore (2017) also found unemployment rate negatively affects share prices at 5% level of significance. In contrast, Shiblee (2009) found unemployment rate insignificantly affects share prices at the NYSE.

The exchange rate in this study was found to negatively affect share prices at the NSE. The exchange rate significantly affected share prices. Kirui et.al (2014) conducted a study on the relationship between selected macroeconomic variables on stock returns at the NSE and found that the exchange rate significantly affected share prices negatively. This finding agrees with the results of our study.

GDP growth rate was found to significantly affect share prices at the NSE positively. This finding has agreed with quite a number of empirical studies. Maskay (2007) agrees that GDP significantly affects stock prices positively. Others studies (Mwaore, 2017; Shiblee, 2009; Kirui et.al., 2014; Sharma & Wongbangpo, 2002) all agree that GDP significantly affect share prices positively.

The level of money supply was found to significantly affect share prices positively at the NSE. This has got support from a similar study done in South Asia by Gunasekarage et. al. (2004) where they found that money supply exhibited one of the strongest influences on stock price movements on the Colombo Stock Exchange. Babu (2017) also found money supply as a significant macroeconomic variable influencing share prices positively at the NSE.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the summary findings of the study carried out to establish the effect of selected macroeconomic variables on share prices of the NSE 20 share index firms listed on the NSE. The chapter also presents the limitations of the study as well as suggestions for further research. The conclusions and recommendations of the findings are also discussed below.

5.2. Summary

The study aimed at establishing whether there exists a relationship between the selected macroeconomic variables, i.e. level of money supply, Gross domestic product, average growth rate, unemployment rate, the 91-day T-Bill rate, inflation rate and the USD mean exchange rate and the share prices of firms listed on the NSE 20 Share Index. The target population for the study was the NSE 20 share index companies listed on the Nairobi Securities Exchange. These independent variables were studied and investigated to find out their influence in predicting share prices. The data was analyzed using correlation analysis, descriptive analysis, as well as regression analysis, which comprised of a number of diagnostic tests.

Results from the study showed a general rise in money supply (M3), share prices, the USD exchange rate, inflation rate, as well as the 91-day T-Bill rate over the period under study, i.e. 2007Q1 up to 2016Q4. However, some periods recorded declines of the same as well, thereby presenting a cyclical pattern for some of the variables, particularly the inflation rate and the 91-day T-Bill rate. The study also found that 91 T-Bill rate and the GDP growth

rate had positive but insignificant effects on share prices while money supply had a positive and significant effect on share prices. The inflation rate, unemployment rate as well as the USD mean exchange rate all had a negative but significant relationship with share prices.

The VIF statistic of collinearity revealed that the predictor variables did not exhibit the presence of multicollinearity. The VIF values computed were 2.43 for GDP growth rate, 2.31 for inflation rate, 2.09 for unemployment rate, 1.99 for the 91-day T-Bill rate, 1.56 for the USD mean exchange rate and 1.24 for the natural log for the money supply. All the values were less than 10 hence within the acceptable range to conclude non-multicollinearity.

The results of the analysis of variance computed a statistic of 18.54. This computed F-value was compared with the critical F-value from the F distribution table and the critical value was 2.42 at 0.05 level of significance and 3.47 at 0.01 level of significance. Both F-critical values were less than the computed F-value hence the goodness of the regression model was confirmed. It was concluded that the model was statistically significant in predicting the share prices.

5.3. Conclusion

The study concludes that 72.97% of variations in share prices were explained by variations in the selected macroeconomic variables. The combined effects of all the six variables therefore had a strong effect on share prices. About 27.03% of variations in the share prices were explained by other factors not included in the research. Share prices of firms listed in the NSE 20 Share Index were positively affected by the 91-day T-Bill rate, the GDP

average growth rate and the money supply and negatively affected by the inflation rate, unemployment rate and the USD exchange rate.

The results infer that inflation rate, normally measured by the Consumer Price Index, has a significant impact on stock performance. This impact is negative and is consistent with the results of Wongbangpo and Sharma (2002) who found that inflation was negatively related to the aggregate price level. This is in contrast to Muchiri (2012) who concluded a positive but insignificant relationship between inflation rate and stock performance.

The study concludes that interest rates (shown here by the 91-day T-Bill rate) do not have a significant impact on stock market performance in Kenya. The relationship is, however, positive which diverts from the findings of Wongbangpo and Sharma (2002) who found that interest rate was negatively related to the aggregate price level of stocks.

5.4. Recommendations

The study recommends that there is a necessity for the Government to regulate the broad money supply in Kenya as there is evidence to suggest that elevated money supply may lead to enhanced stock market performance. This should therefore encourage the Central Bank to formulate sound monetary policies that will safeguard and ensure high liquidity in the market to give investors more cash to invest in the stock market.

The study also recommends that there is need for the Government to instigate measures to control the exchange rate in Kenya. The Government should engage in sound fiscal policies to regulate the exchange rate and stabilize it in order to avoid suppressing the economy and instead, avail more cash to be invested in the stock market.

5.5. Limitations of the Study

The study focused on six independent variables, that is, the 91-day T-Bill rate, rate of inflation, unemployment rate, money supply, GDP growth rate, and the exchange rate. The interpretation of these results, as concerns the macroeconomic factors, should therefore be restricted to the variables under study as named here.

The study is also country-specific and as a result, the results cannot be applicable to other countries which operate in macroeconomic environments different to Kenya. Therefore, any interpretation of these results outside Kenya should be done bearing this in mind.

5.6. Recommendations for Further Research

From this paper and in comparison, to other papers, there exist conflicting results on which macroeconomic factors really affect stock performance. This study used six macroeconomic variables as outlined above and it is important to note that they are not the only macroeconomic variables that influence the performance of the stock market.

The study therefore recommends that further research could include other variables not included in this study which have an impact on the share prices of firms listed in the NSE 20 Share Index.

The study used regression model to analyze data in the STATA software. Other data analysis tools and models can be used to assess the relationship between macroeconomic variables and share prices.

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