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

BY

MERCY WACHIA MWAORE

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DECLARATION

Student's Declaration

I, Mercy W. Mwaore, declare that this project report is my original work and has not been presented to any other college, institution or university for examination.

Sign…….. Date…….

Mercy Wachia Mwaore (D61/79738/2015)

Supervisor's Declaration

This research project report has been submitted for examination with my approval as the University Supervisor.

Sign……. Date…….

Dr. Erastus Kisaka Sifunjo

Department of Finance and Accounting

School of Business

University of Nairobi

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DEDICATION

I dedicate this project to my daughters Brenda, Sandra and Rose for their love, support and encouragement. May God richly bless them.

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ABBREVIATIONS

AMEX	American Stock Exchange
ANOVA	Analysis of Variance
APT	Arbitrage Pricing Theory
ASE	Amman Stock Exchange
ASEA	African Securities Exchanges Association
ASEAN	Association of Southeast Asian Nations
BOT	Balance of Trade
BSE	Bombay Securities Exchange
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
CPI	Consumer Price Index
EASEA	East African Securities Exchanges Association
ECM	Efficient Capital Markets
EMH	Efficient Markets Hypothesis
ER	Exchange Rate
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
GFC	Global Financial Crisis

GNP	Gross National Product
IIP	Index of Industrial Production
ISE	Istanbul Stock Exchange
KNBS	Kenya National Bureau of Statistics
KSE	Karachi Stock Exchange
MS	Money Supply
MPI	Market Pressure index
NASDAQ	National Association of Securities Dealers Automated Quotations
NSE	Nairobi Securities Exchange
NYSE	New York Securities Exchange
OLS	Ordinary Least Squares
PPI	Producer Price Index
PVM	Present Value Model
R	Correlation Coefficient
R2	Coefficient of Determination
SPSS	Statistical Package for the Social Scientist
UR	Unemployment Rate
US	United States
VAR	Variable Data Analysis
VECM	Vector Error Correction Model

VIF	Variance Inflation Factors
WFE	World Federation of Exchange

ABSTRACT

The stock market facilitates the exchange of financial assets by bringing buyers and sellers of securities together. It acts as a plat foam for convergence between deficit users and excess suppliers of funds. Security markets promote price discovery of instruments traded therein and therefore play an important role in shaping stock markets performance. The study sought to examine the effect of macroeconomic variables on stock prices of firms listed on the Nairobi Securities Exchange. The macroeconomic variables studied were Gross Domestic Product mean growth rate, the unemployment rate, CBK interest rate and USD mean foreign exchange rate. The NSE 20 share index was used as a proxy for the share price. Quarterly secondary data for the period January 2007 to December 2016 from KNBS and CBK was used in the study to investigate the relationship. Multiple regression model was employed to analyze data in SPSS. The study revealed that 41.9% variations in share prices were explained by variations in the four macroeconomic variables. It was implied that 58.1% of variations in the share price was explained by other factors not included in the study. The study concluded that macroeconomic variables studied had a combined moderate effect on the share prices of firms listed in the NSE. Share prices of firms listed in the NSE were positively affected by growth in GDP and negatively affected by changes in unemployment rate, interest rate, and foreign exchange rate. It was concluded GDP had a significant positive effect on share prices, CBK interest rate and USD foreign exchange rate had a negative effect on share prices, while unemployment rate had a significant negative effect on share prices of firms listed in the NSE. Results of the study further revealed that a unit change in GDP would cause a positive increase in share price by 167.349 units, a unit change in unemployment would result to a negative change of 548.326 units in share price and one-unit change in interest rate would result to a negative change of 58.115 units in share price. A unit change in the foreign exchange rate would result in an adverse change of 26.384 units in share price. It was evident from the results that unemployment rate had the highest negative unit change in share prices than interest rate and foreign exchange rate while GDP had a high positive effect.

CHAPTER ONE: INTRODUCTION

1.1 Back ground of the Study

The correlation amongst macroeconomic factors and the performance of the stock market remains an area of intense investigation in academia over the years without conclusive results. The stock market facilitates the exchange of financial assets by bringing buyers and sellers of securities together. It acts as a plat foam for convergence between deficit users and excess suppliers of funds. Deficit units sell their stock in the market while excess suppliers purchase these stocks in exchange for money. Depending on the market activity which is influenced by the law of demand and supply, the interchange may cause disequilibrium on prices of stock in either direction. Security markets promote price discovery of instruments traded therein and therefore play an important role in shaping stock markets performance.

Fama (1970) in his classical taxonomy of efficient capital markets clearly stated that markets are efficient when share prices "fully reflect" all prevailing information in both public and private domain. Investors in the stock market will often embrace strategies based on information about the movement of share prices because these changes affect the steadiness of the stock market (Wang, 2010). Stock prices are determined by several macroeconomic dynamics according to Ross (1976) proposition of the Arbitrage Pricing Theory (APT). According to the APT model, affiliation between share prices and various macroeconomic factors is modeled as a linear function denoting that macroeconomic variables are key determinants of stock returns and market performance.

The impact macroeconomic factors have on stock prices have been widely researched in developed markets according to literature review with the unending quest for a

number of research questions. The most elaborate examination of existing works by other scholars on the topic was done by Kaur, Singh, and Gupta (2016) who reviewed a total of 190 publications from 1961 to 2014 with an array of varied findings even within the same market at different time intervals. This explains why research on how stock prices are affected by changes in economic dynamics is still a subject of passionate study across the globe especially in emerging and underdeveloped markets of the sub-Saharan continents. The variables widely analyzed in these studies include inflation, exchange rates, industrial productivity, interest rates, Gross Domestic Product (GDP) and money supply.

Local studies done by Mumo (2017), Mugambi and Okech (2016), Kitati, Zablon and Maithya (2015), Mutuku and Ng'eny (2015), Ouma and Muriu (2014), Ochieng and Oriwo (2012), Kisaka and Mwasaru (2012), Aroni (2011), Mwai (2011), and Sifunjo (1999) to determine the effect macroeconomic variables had on stock prices at different time periods, focused on foreign exchange rates on hard currencies, GDP, money supply, inflation and interest rates with inconsistent results.

1.1.1 Macroeconomic Variables

Macroeconomic variables are those economic fundamentals which have the potential of affecting the performance of the country's economy, the stock market returns and stock price volatility (Kitati, Zablon, & Maithya 2015). Examples include employment/unemployment rate, foreign exchange rates, GDP, money supply, interest rate, industrial production rate, inflation rate to name but a few.

Brinson, Singer, and Beebower (1991) described macroeconomic variables as those factors significant to an economy as a whole and shake a great population relatively

than a select few of them. The GDP, unemployment, exchange rate and inflation were identified as the variables that have a major influence on the economy.

GDP is a measure of aggregate income earned by a country from its local and foreign elements of production (Mankiw, 1997). A momentous change in GDP either positive or negative impacts directly on the stock market return. An economic outlook that promises an expansion of the economy will certainly cause stock prices to rise because a rational investor will seek to buy stocks and benefit from the proceeds of an expanded economy. The opposite is also true when it is anticipated that there is going to be a recession of the economy, stock prices tend to decline with investors opting to sell their stock and purchase securities with a lesser risk such as bonds.

Basu (2011) defined inflation as a general rise in prices of goods and services across the board. The most common indicators used to measure inflation are consumer price index (CPI) and producer price index (PPI). PPI tracks the average price of a basket of goods that a company uses to transform them into finished products. Higher producer inflation depletes company profits, shrink's expansion, and the growth of markets and consequently increases unemployment because companies cease to hire workers. Stock prices rise or fall based on production indices signals.

The unemployment rate is another significant indicator used to measure the underutilization of labor supply in a country (www.ilo.org). Information on unemployment signals market participants on the strength and wealth of the economy. A higher employment rate means higher economic output, more sales, higher returns and high corporate profits. Stock prices and stock market returns rise or fall with increase or decrease in the employment rate. High unemployment rate means slow growth, low corporate profits, falling stock prices and low stock market return.

1.1.2 Stock Prices

Weston (as cited in Musyoki, 2012) defined share price as the value of the company divided by the outstanding number of shares. It is the implied value an asset can fetch from the market determined by the company performance. It is the present value of expected future earnings discounted by a constant rate of return. From this definition, it can be adduced that the price of a stock is determined by the earning capacity of the firm i.e. future cash flows and the expected rate of return.

Share price fluctuations at the NSE are generally dependent on the market interactions between users and suppliers of funds and has a direct impact on the market capitalization of the individual companies and the market in general (Sifunjo & Mwasaru, 2012). Economic fundamentals, company specifics, stock market volatility and political shocks are some of the factors that affect stock prices.

The ECM postulates that information in stock markets comes in a random manner. It, therefore, implies that share prices adjust instantaneously to information received. The volatility in stock returns is at best explained by the unpredictability of stock prices. In finance, the intrinsic value of a firm is the product of share price multiplied by the number of shares outstanding at a particular time. According to investors, when a market experiences excessive volatility, then the importance of share prices as an indicator of firm value is weakened (Karolyi, 2001).

Share prices are determined by various fundamental economic factors for instance inflation, GDP, CBK mean exchange rate interest rates and unemployment rate. In advanced countries, variations of share prices are largely associated with volatilities of macroeconomic variables (Muradoglu, Taskin, and Bigan, 2000).

1.1.3 The Relationship between Macroeconomic Variables and Shares Prices

"Many researchers have determined that macroeconomic factors contribute a lot to the determination of share prices and have been found to be significant in regards to stock market" (Tvaronavičienė and Michailova, 2006). The relationship between share prices and economic fundamentals is still an area of further research in many emerging markets because of diverse findings noted from the existing studies.

Ozlen & Ergun (2012) studied the trend in stock returns of 45 firms at the Istanbul Stock Exchange (ISE) from February 2005 to May 2012 and how they are affected by macroeconomic variables. The variables studied were inflation, unemployment, foreign exchange and interest rates. The researcher employed an autoregressive distributed lag method to analyze data and concluded that inflation and unemployment did not have a significant effect on the stock returns.

Oluseyi (2015), in his quest to examine whether a causal relationship exists amongst the determinants of share price and macroeconomic factors in the stock market of Nigeria, collected data on money supply, GDP, exchange rate, inflation and interest rate for a period of 10 years from January 1994 to December 2014, and investigated their influence on share prices. Analysis of the data using GARACH (1,1) model revealed that GDP, money supply, and inflation influenced share price volatility, while regression analysis and Granger-cause revealed that interest and foreign exchange rates have a significant relationship with share price volatility. The existence of information asymmetry and lack of institutional investors were singled out as possible reasons for the weak correlation amongst macroeconomic factors and share price volatility.

Mjomba (2017) studied companies listed on the NSE with the objective of establishing whether a relationship exists to explain the influence of macroeconomic factors on

market capitalization. Secondary data on inflation, public debt, interest, and foreign exchange rates were analyzed for a period of 35 years from 1980 to 2014 and concluded that inflation, interest rate, and public debt had a negative impact on market capitalization. On the contrary, the foreign exchange rate had a positive significant influence on the market capitalization of banks listed on the NSE.

Otieno, Ngugi, and Wawire (2017) did a study to determine how stock market returns in Kenya responded to the events of the global financial crisis (GFC) and inflation of 2008. The data utilized in the study covered a period of 23 years from January 1993 to December 2015. Results of the data analysis revealed that the stock market returns were severely affected by the aftermath of the 2008 GFC.

Rachel and Moses (2017) did a research to establish how the performance of the NSE was affected by the government's decision to cap the interest rates on lending by commercial banks. Data related to interest rate and the NSE all-share index were collected from January 2012 to January 2017. The event study methodology was employed to analyze data and results revealed that interest rate capping had a negative effect on the stock market performance.

1.1.4 Nairobi Securities Exchange (NSE)

The Nairobi Securities Exchange (formerly known as the Nairobi Stock exchange), was initiated in the early 1920s but commenced operations in 1954 as a voluntary association of stock brokers registered under the Societies Act (Ngugi and Njiru, 2005). In the spirit of efficiency in service delivery, the NSE commissioned the electronic trading system (ETS) in 2006 and in 2007 installed the wide area network (WAN) platform. This development enabled brokers to transact business from the comfort of their offices. The Capital Markets Authority (CMA) is a regulatory body in Kenya that

regulates the operations of NSE. Despite the progress made by NSE in terms of growth, it is still categorized as an emerging market in the world. The NSE 20 share index rose from a low of 2,796 in January 2017 to a high of 3,607 in June 2017. The total number of shares traded was 572 in January 2017 compared to 749 in June 2017. The total value of shares traded amounted to KES. 12,054 million in January 2017 and KES. 17,144 million in June 2017. (https://www.knbs.or.ke)

Performance of the NSE declined in the last quarter of 2016 due to the implementation of the amendments made in the Banking Act with regard to interest rate capping. Uncertainty about the outcome of the general elections held in August 2017 seemed to have taken its toll on investment in the stock market and the general decline in the economy as a whole also contributed to the low performance of the stock market. According to the Capital Markets Authority, equity turnover at the NSE reduced from 46.1 billion in the fourth quarter of 2015 to 25.4 billion in the same period of 2016. The declining trend was further affected by the outcome of the US presidential elections which caused a big drop in stock prices in the worlds' capital markets. There were a total of 65 listed companies as at November 2017 in 13 trading sectors. The study focused on firms included in the computation of the NSE 20 share index. **(See appendix1)**

1.2 Research Problem

The effects of macroeconomic variables on the performance of the stock market has been a subject of research for many decades with no sure conclusion of which variables have a major impact on the stock markets' performance across the globe. According to Fama (1970), the share price is perceived in terms of market efficiency. The point of market efficiency depends on the speed and accuracy within which macroeconomic variable information is built into the share price.

According to the Kenya Economic Outlook (2017) most of the leading economic indicators were fairly stable. There was an increase in the country's annual GDP from 5.6% in 2015 to 5.8% in 2016. However, the rate was expected to decline to 5.5% in 2017 due to uncertainty about the outcome of the general elections held on 8th August 2017. The CBK rate and unemployment rate were fairly stable at 10% and 11% respectively in the year 2016. According to the KNBS the Kenya shilling strengthened against the USD by 0.1% between December 2015 and December 2016 (https://www.knbs.or.ke). The performance of the NSE declined in the last quarter of 2016 due to implementation of the Banking (Amendment) Act, 2016 that caps lending rates.

Mutuku and Ng'eny (2015), investigated the association of four economic variables with the performance of share prices at the NSE and concluded that Treasury bond rate, GDP, and Exchange rate had a favorable relationship with the share prices at the NSE.

Mumo (2017), examined the effect of selected macroeconomic variables on share prices at the NSE using Vector error correlation model (VECM) and Johansen co-integration methodology and concluded that inflation was not important in explaining changes in share prices, while interest rate and foreign exchange rate had a positive correlation with share prices. Share prices are known to be influenced by inflation, exchange rate, GDP/GNP, money supply, interest rate, and treasury bills rate (Mugambi, & Okech, 2016; Kitati, Zablon, & Maithya 2015; Ozlen, & Ergun, 2012).

Barakat, Elgazzar, and Hanafy (2016) analysed 15 years data from Egypt and Tunisia emerging capital markets on how share prices were affected by macroeconomic shifts and concluded that interest rate, exchange rate, CPI and money supply were influential in distressing operations of the stock markets in both countries.

Empirical studies reviewed both local and international have diverse findings based on the Country of study, the stock market, the time and period of study, the variables used and the data analysis methodology. It is rather challenging to take a broad view of the results due to the distinctiveness of each study.

The study sought to contribute to the body of knowledge by answering the research question what macroeconomic factors cause share price volatility in the NSE?

1.3 Research Objective

The study sought to examine the effect of macroeconomic variables on stock prices of firms listed on the Nairobi Securities Exchange.

1.4 Value of the Study

The study is beneficial to market practitioners, policy makers, investors and the general public. Market practitioners are expected to benefit from the study aimed at enhancing their understanding of key macroeconomic factors and the effect of such factors on the variation of stock prices. The study shared some insights through empirical evidence of the key indicators to watch out when trading at the securities exchange.

Policy makers are also expected to benefit from the study which highlights explanatory variables in the movement of stock prices and develop policies to strengthen the stability of the stock market.

Investors and the general public are able to single out economic fundamentals which accelerate their wealth creation through improved share prices in the stock market. The volatility of stock prices as a result of macroeconomic factors enlightens would be investors when to forecast performance and trigger their investments in the stock market.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The theoretical and empirical framework in support of the current research on selected macroeconomic factors and their effect on share prices are discussed in this chapter. Both international and local research has been highlighted to provide factors that affect the movement of share prices.

2.2 Theoretical Literature Review

Three theories have been selected that link the effects of macroeconomic variables and stock prices. They are discussed below:

2.2.1 Efficient Market Hypothesis (EMH)

Fama (1970) in his classical review of theory and empirical work on efficient markets and the behavior of stock prices defined efficient markets as "a market where stock prices always "fully reflect" all available information" (Fama, 1970, p. 383). It, therefore, means that current prices of stock have already integrated new information. Market participants cannot earn excess gains by dealing with the premise of new information because it's already incorporated in the share price (Lo & MacKinley, 1999: Jensen, 1978). If share price remains unaffected even after the release of new information to all market participants then it means that the stock market is efficient (Malkiel, 1992). The term efficiency in the concept of Efficient Capital Markets (ECM) refers to informational efficiency. Information efficiency is classified into three subsets, weak, semi-strong and strong form efficiency.

According to Fama (1970), weak form efficiency infers that share prices fully reflect all available past information and investors cannot use historical information to make economic profits. Semi-strong form efficiency indicates that share prices fully reflect

all historical and public information while strong form efficiency suggests that share prices have incorporated all past, public and private information. In all the three forms of information efficiency, it is impossible for investors to beat the market hence they can only earn normal profits. A stock's intrinsic value is best estimated by the stock price because it integrates all available information (Cleary, 2001). Available information indicating shifts in economic variables potentially influences movement in stock prices. It is envisaged that changes in the study variables have been incorporated instantaneously into the share prices of firms listed in the NSE.

2.2.2 Capital Asset Pricing Model (CAPM)

The single factor model was developed by Sharpe (1964), Lintner (1965, 1969) and Mossin (1966), to determine the performance of financial securities. It offers a hypothetical base for prizing stocks through computation of the expected rate of return. CAPM links the riskiness of an asset measured by beta and the expected return of that asset. The model assumes that the return of an asset is only affected by two risks, the systematic and non-systematic risks. Although the systematic risk is inherent in holding a market portfolio that is affected by market moves, a non-systematic risk is unique to a specific asset and it can be diversified by holding portfolios along the efficient frontier.

Since the model has strict assumptions it was criticized in many studies that gave impetus to the evolution of the arbitrage pricing model by Ross (1976). Macroeconomic alterations affecting the study variables have an impact on the stock market return that also influences the expected rate of return computed from the model.

2.2.3 The Present Value Model (PVM)

The PVM has been used to test the EMH by computing the share price and comparing them with what the market offers. Since share prices are affected by various economic fundamentals, this model pursues the connection amongst these factors and their influence on the behavior of share prices (Sarkar, 2012). PVM is focused on linking share prices with macroeconomic variables and reveal the impact these variables have in shifting share prices. The model uses two components (expected dividends and the discount rate) in determining the value of a stock. According to this model, stock prices are influenced by news about fundamental economic factors that have an impact on these two components (Chen et al, 1986, Naik & Padhi, 2012).

The PVM has been practically employed to forecast share prices (Frydman, Goldberg & Mangee, 2015). Share prices are a function of all the discounted future dividends at the prevailing average rate of return in the market (Shiller, 1992). Future dividends are an outcome of the annual operations of a firm which operates in an uncertain environment. Therefore, any shift in the study variables caused by the external environment spontaneously influence the expected future dividends and consequently the share price.

2.2.4 Arbitrage Pricing Theory (APT)

Ross (1976) developed the Arbitrage Pricing Theory (APT) after the single factor model of CAPM suffered criticism from other researchers because of its assumptions. The APT model presented an aspect of multiple factors in determining the asset price given the factor's associated risks. It emphasized that asset prices are driven by macroeconomic factors thus providing a theoretical framework linking the two aspects. Chen, Richard, and Ross (1986) in their first empirical investigation of the APT model were in agreement that share prices are derived from some basic valuation models. As

seen from the present value model, estimation of share prices revolve around two major components, expected future dividends and the expected rate of return.

In their study to determine the forces that drive share prices in the stock market Chen.et.al (1986) suggested that the choice of variables should be those that have the ability to systematically influence expected future dividends and the investors expected the rate of return which is the discount rate. In this study GDP, inflation rate, and unemployment rate have been selected as systematic variables to determine their effect on share prices of firms listed on the NSE. The APT model will be used to link the study variables and the share price of firms listed in the NSE.

2.3 Determinants of Stock Prices

Stock price volatility and the stock market performance are broadly affected by changes in macroeconomic variables in diverse directions depending on the variables studied and the time frame incorporated in those studies. According to Shiblee (2009) stock price behavior is affected by four key factors: GDP, unemployment rate, inflation and money supply.

Maghayereh (2002), and Osisanwo and Atanda (2012) indicated that the key determinants of stock prices are inflation rate, gross domestic product, interest rate, money supply and exchange rate. Investors who wish to earn good returns from investing in the stock market should monitor these variables which have a great influence on stock prices.

2.3.1 Gross Domestic Product (GDP)

The GDP is an economic indicator for the development of a country. It measures finished products and services produced within the Country by both local and foreign

owned enterprises. It's an economic indicator of the development, growth, and health of the country.

Stock markets are known to drive the economy of a nation and are one of the yardsticks in determining the economic growth of a country. Stock prices indices, on the other hand, are considered by empirical studies and economic theories to be the greatest pointers of the performance of the stock market. Hence according to Ahmed (2008), share price indices are greatly affected by changes in economic fundamentals. Investors who prefer more returns on their investments should concentrate on macroeconomic factors (GDP in this study) that wobble share prices (Musilek, 1997). A considerable association exists amongst stock markets and real GDP, production index, oil price, and private consumption among others (Buyuksalvarci, 2010; Chaudhuri & Smiles, 2004; Ibrahim, 2003).

Majority of the studies found that GDP has a significant influence on the shares price (Ismail, Pervaz, Ahmed, & Iqbal 2016; Laichena & Obwogi, 2015; Nkechukwu, Onyeagba, & Okoh, 2016). The Country's GDP rose from 5.6% in 2015 to 5.8% in 2016 but is expected to decline to 5.5% in 2017 because investors are not keen to undertake projects in Kenya due to uncertainty in the results of the 8th August 2017 elections. The study used mean GDP to examine its effect on share prices of firms listed on the NSE.

2.3.2 Inflation Rate – Producer Price Index (PPI)

Basu (2011) defined inflation as a state where the country's economy experiences a sustained rise in prices of all commodities eroding the purchasing power of the general public. It is a phenomenon where there is a general rise in prices across the board. In times of inflation, uncertainty and distortion about the economy sets in and affects other

variables such as interest rates, exchange rates, FDI, CBK lending rates. The spiral effect of these distortions impacts on the shares prices and the performance of the stock market is also affected. There exists an association between stock markets and inflation and so whenever there is a general rise in price levels the stock market is the worst hit resulting in high volatility of share prices and market indices. Fama (1970), share prices are most influenced by economic fundamentals such as GDP, money supply, foreign exchange rate, interest rate, and inflation.

According to the Country's economic outlook 2017, inflation stood at 6.3% in 2016 but rose to 7.0% in January 2017, 9.0% in February 2017 to a high of 10.3% in March 2017. This rise in digit inflation was occasioned by rising costs of electricity and food. It was anticipated that due to discreet monetary policies by the CBK, inflation will average 5% in the coming years 2017 to 2020.

2.3.3 Unemployment Rate (UR)

Unemployment arises where a percentage of the working-age population is not engaged in any gainful employment. Unemployed workers are those persons who are not engaged in any formal or informal gainful employment though they are willing to work, are persistently searching for work and are currently available for work. (ILO). (*www.ilo.org)*

Unemployment is expressed as a percentage of the total labor force. It is a good pointer to the Country's failure to create jobs for its labor force. The unemployment rate announcement by ILO forms part of the news that causes movement of share prices in the world stock markets hence one of the key economic factors that affect the behavior of share prices.

An expected rise in the unemployment rate is alleged to be a good pointer for the stock markets because share prices rise during such times when the economy is expanding. However, during a contractionary period, rising rate of unemployment is not good for the stock markets because share price tends to decline at such a time. (Boyd, Hu & Jagannathan 2005; Gonzalo & Taamouti 2011). Muthike and Sakwa (2012) also argued that unemployment rate is one of the variables which influence stock prices among others.

2.4 Empirical Literature Review

Flannery and Protopapadakis (2002), studied the magnitude of macro announcements on daily equity earnings of three weighted market indices (NYSE, AMEX, and NASDAQ) for a period of 17 years from 1980 to 1996. Seventeen surprise announcements were observed and an assessment of their impact on the daily return was done using GARCH (1,1) model and multiple regression. The researchers' identified "as a potential "risk factor" any macro announcement series that either affects returns or increases the market's conditional volatility" (Flannery & Protopapadakis, 2002, p. 774). Results from the data analyzed revealed that six out of the seventeen observed announcements had a strong risk factor in influencing the daily market returns. These variables are Unemployment, PPI, CPI, Money Aggregate M1, Balance of trade, and Housing.

Tursoy, Gunsel, and Rjoub (2008) tested empirical evidence of the APT model on the ISE stock returns. Data analysis covered a period of 56 months February 2001 to September 2005. Thirteen factors were tested eleven industry segments of the ISE. Among the thirteen tested factors were unemployment, GDP, and CPI. The study used the ordinary least square (OLS) technique which showed that unemployment was not influential in determining the proceeds earned from holding stock units at the ISE.

Shiblee, (2009) studied the impact of four selected variables on share prices of the industrial segment at NYSE from 1994 to 2007. Data collected from the Federal Reserve website was analyzed using the multiple regression models. The analysis showed that all sampled factors affected share prices of the segment differently. Money supply had the strongest positive impact on share prices followed by GDP. The effect of Inflation and unemployment on share prices was weak for most companies.

Mwai (2011) sampled four economic forces (GDP, inflation, interest rate and the exchange rate) and assessed their relationship with share prices of firms at the NSE. He reviewed data from 2002 to 2012 using the SPSS. The study showed that share prices are determined by all the four economic fundamentals employed in the study. The correlation matrix indicated that all the variables used were highly and positively correlated with share price index.

Abedallat and Shabib (2012), assessed the fluctuating effects of investments and GDP against share price movements of firms listed on the Amman Stock Exchange (ASE). They employed multiple regression to analyze data collected from 1990 to 2009. They concluded that stock price movement as measured by the ASE Index was affected by both variables but the change in investments had a greater impact on the ASE Index as opposed to change in Gross Domestic Product.

Ozlen & Ergun (2012) studied the influence interest rate, unemployment rate, inflation and exchange rate had on the stock returns of 45 firms and from 11 diverse segments from February 2005 to May 2012. Analysis of data revealed that interest rate and exchange rate substantially affected proceeds from the activities of the equity market due to share price fluctuations.

Kitati, Zablon, and Maithya (2015) investigated the share prices of companies listed with NSE with the objective of establishing which macroeconomic factors influence its behavior. The study sampled three factors and analyzed data ranging from 2008 to 2012. Findings of the data analysis using multivariate regression revealed that interest rates largely influenced share prices, the exchange rate of hard currencies (Euro and USD dollar), inflation and interest rates adversely affected the movement of stock prices.

Mutuku and Ng'eny (2015), investigated four variables (Treasury bond, nominal GDP, CPI, and nominal exchange rate) the objective of establishing their association with the performance of share prices at the NSE for a period of 14 years from 1997 to 2010. Quarterly data on the variables was analyzed using co-integration and vector autoregressive framework revealed that inflation had a negative impact on the stock market suggesting that investors cannot hedge against the effects of inflation by investing in stock units. They concluded that Treasury bond rate, GDP, and Exchange rate and had a favorable relationship with the share prices at the NSE.

Mugambi and Okech (2016) in their research about listed Commercial Banks in Kenya sought to understand how exchange rate, inflation rate, interest rate and GDP affect returns on their stocks. Data were analyzed for a period of 5 years from 2000 to 2015 and concluded that all these variables except GDP were significant in influencing the performance of stock returns at 5% level of significance.

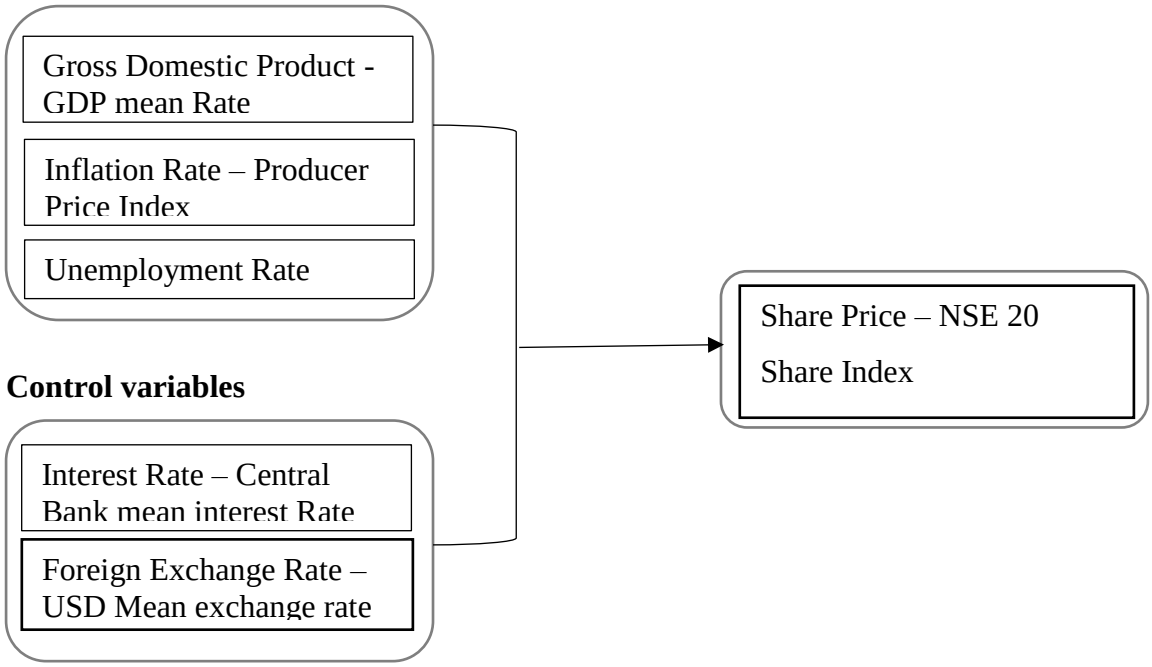
Mumo (2017), used selected variables (NSE 20 share index- a proxy for the share price, foreign exchange rate, Inflation, interest rate and money supply) to understand how share prices are affected by changes in macroeconomic factors. Vector error correlation model (VECM) and Johansen co-integration methodology were used to analyze data

covering a period of 18 years from 1998 to 2015. The findings revealed that inflation was unimportant in explaining changes in share prices, while interest rate and foreign exchange rate had a positive correlation with share prices. Gains achieved through changes in money supply were offset by the effects of inflation.

2.5 Conceptual Framework

A conceptual framework is a pictorial presentation of how the variables of interest are linked to each other. GDP, PPI, and unemployment rate represent Independent variables while the share price is the dependent variable.

Figure 1. A Pictorial Presentation of the Conceptual Framework



The control variables used in the study were interest rate (Central Bank rate) and foreign exchange rate (USD mean monthly rate). They were incorporated in the regression model to determine the relationship between the dependent and independent variables.

2.6 Summary of the Literature Review

The empirical studies analyzed revealed that different macroeconomic variables were used by different researchers to investigate their effect on the share prices. Varying conclusions were arrived at using different time periods, both long run and the short run in different markets or even in the same market. The inconclusiveness of empirical evidence in both local and foreign studies was reason enough to undertake further research employing other macroeconomic variables to determine their influence on share prices.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter discusses the methods used to collect, validate and analyze data; determine the population of study and sample selection; and development of models to realize the intentions of the research.

3.2 Research Design

The descriptive research design was considered appropriate for the study because of its comprehensiveness in data collection and analysis. It focused on linking the variables being studied. Cooper and Schindler (2003) defined a research design as a blueprint that is used to select the sources of data. It is an outline of how the researcher collects and incorporates information into the study.

A descriptive research design was employed in the study to explore the connection between selected macroeconomic factors and share prices of firms listed on the NSE. The data studied covered a period of ten (10) years from January 2007 to December 2016. The period covered the time when the country experienced post-election violence due to disputed election results in 2007 and subsequent adverse impact on almost all economic lead indicators. This scenario resulted in a coalition government and after a period of three years, the country started experiencing a positive growth in the economy. The study used multiple linear regression analysis to examine the connection amid chosen macroeconomic factors and share prices.

3.3 Population

The study targeted all 65 firms listed on the Nairobi Securities Exchange.

3.4 Sample Design

The sample was made up of the 20 firms which constitute the computation of NSE 20 share index. It was considered that the sample of 20 firms is representative of the population. The NSE 20 Share Index monitors the performance of only 20 premier companies with the highest market capitalization from each segment listed on the Nairobi Securities Exchange. The NSE 20 Share Index is updated on a daily basis after the close of the market and so by using it as a proxy for the key sector performance you can understand the price volatility of the share index without reference to individual share prices.

3.5 Data Collection

The study utilized secondary data from the NSE, KNBS and Central Bank of Kenya. Secondary data refers to information resource readily available from other parties (Cooper and Schindler, 2003). Share prices were measured using the NSE 20 share index. The GDP mean growth rate, Unemployment rate, and PPI were used as independent macroeconomic variables. Quarterly data for 10 years (January 2007 to December 2016) was collected and analyzed.

3.6 Diagnostic Tests

The consistency and legitimacy of data are important concepts in research because they enhance the accuracy of the assessment and evaluation of a research work (Tavakol and Dennick, 2011). Diagnostic tests were applied to the secondary data to determine the existence of any correlation between the variables. The analysis of variance and coefficient of correlation were also executed on the data set to establish the direction of the relationship between variables. Tests to explore the existence of multicollinearity were performed using the Variance Inflation Factors (VIF). Normality tests on the data

set were performed using the Shapiro-Wilk and Kolmogorov-Smirnov. The results of the tests are discussed in chapter four on data analysis.

3.7 Data Analysis

The study used multiple regression analysis to determine the correlation between the selected macroeconomic variables and share prices. Data were analyzed using the SPSS Statistics version 23.

3.7.1 Analytical Model

The Arbitrage Pricing Theory was be used as the model equation to be tested as follows;

$S_p = \beta_o + \beta_1 GDP + \beta_2 PPI + \beta_3 UR + \beta_4 INT + \beta_5 ER + \varepsilon_i$, Where;

Sp = Share price as measured by the NSE 20 share index

GDP = Gross Domestic Product mean growth rate

PPI = Producer Price Index (Proxy to Inflation)

UR = Unemployment Rate

INT = Central Bank of Kenya Mean Interest Rate

ER = USD Mean Foreign Exchange Rate

β0 = The constant term

β1, β2, β3, β4, β5 = Coefficients of Macroeconomic Variables

εi = The error term

3.7.2 Test of Significance

The sample data gathered through secondary means were analyzed using a statistical inference that aided to assess the effect of macroeconomic variables on the share prices

of firms listed in the NSE. The tests for making inference on the population of the study included the Correlation coefficient (R), the coefficient of determination (R2) and analysis of variance (ANOVA).

The correlation coefficient (R), was used to measure the strength and the direction of the linear relationship between two variables that is, each of the selected macroeconomic variables to the share price. The coefficient of Determination (R2) or the coefficient of multiple determination for multiple regression, is a statistical measure that was used to determine the extent of the relationship between the selected data fitted on the regression line. ANOVA looked for significant differences between means of the study variables. This study made use of ANOVA to determine the significance of the macroeconomic variables to the share prices at the NSE in the selected period of study.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings of the analysis performed on the data and conclusions of the study carried out to determine whether macroeconomic variables are significant in explaining changes on the share price of firms listed in the Nairobi Securities Exchange. Data on GDP mean growth rate, USD mean exchange rate, and NSE 20 share index was obtained from the Kenya National Bureau of Statistics website and the rate of interest (CBK mean rate) was obtained from the Central Bank of Kenya website. Data on unemployment rate was obtained from the World Bank website. Descriptive statistics, correlation and regression analysis were used in the study to analyze data.

4.2 Descriptive Statistics

The mean and standard deviation of all the variables were computed using descriptive statistics. The results of the computation are shown in table 4.1 below.

Table 4. 1 Descriptive statistics

Descriptive Statistics

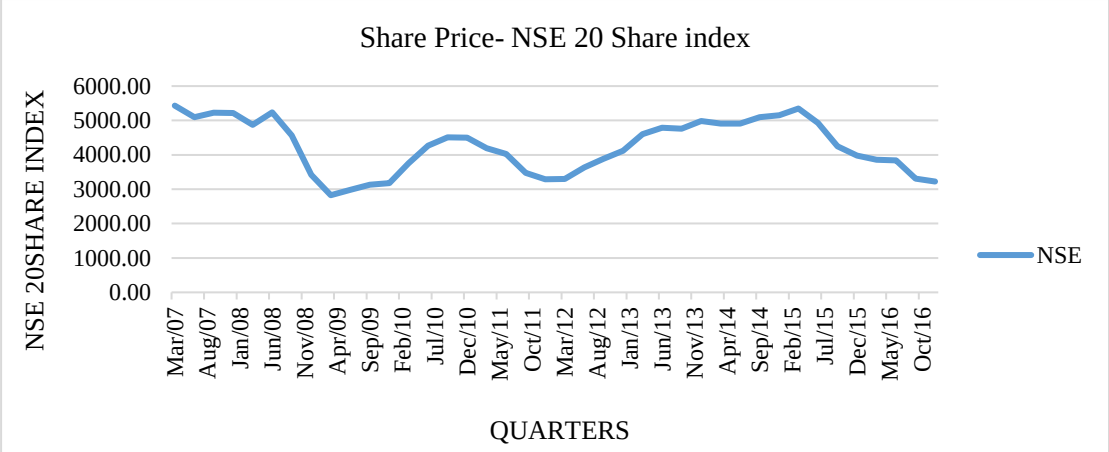
	N	Min.	Max.	Mean		Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Std. Error	Statistic	Std. Error
GDP Growth rate	40	.30	8.30	4.8825	.29725	1.87997	-.775	.374	.148	.733
Unemployment rate	40	11.00	12.18	11.6680	.07090	.44840	-.335	.374	-1.619	.733
CBK mean rate	40	5.83	18.00	9.4479	.45558	2.88136	1.607	.374	2.760	.733
USD Mean rate	40	62.95	102.97	84.0739	1.74595	11.04238	-.012	.374	-.588	.733
NSE 20 share index	40	2826.23	5431.77	4252.1717	121.99218	771.54629	-.196	.374	-1.270	.733
Valid N (listwise)	40									

a. Dependent variable: NSE 20 share index
b. Independent variables: GDP mean rate, unemployment rate, CBK mean interest rate, USD mean exchange rate

Source: KNBS, CBK, World Bank and Research Findings

The unemployment rate, USD mean exchange rate, and NSE 20 share index are approximately symmetrically skewed implying that they are normally distributed. According to the rule of thumb if skewness is between -0.5 and 0.5 then the distribution is said to be approximately symmetrical.

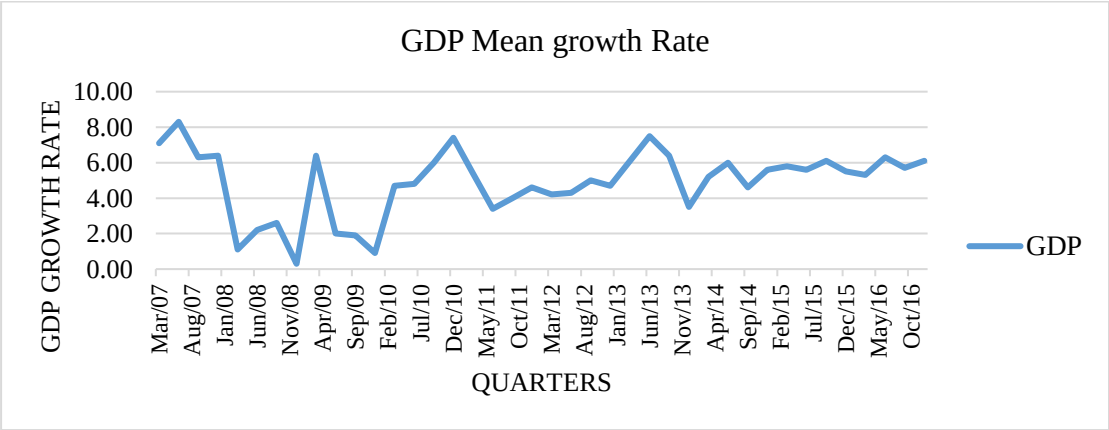
Figure 2 Line Graph of Share Price from January 2007 to December 2016



Source: KNBS and Research Findings

The mean share price for the period of study was 4,252.17 with a standard deviation of 771.55. The lowest share price for the period of study was 2,826.23 and the highest price was 5,431.77 as shown in figure 2 above.

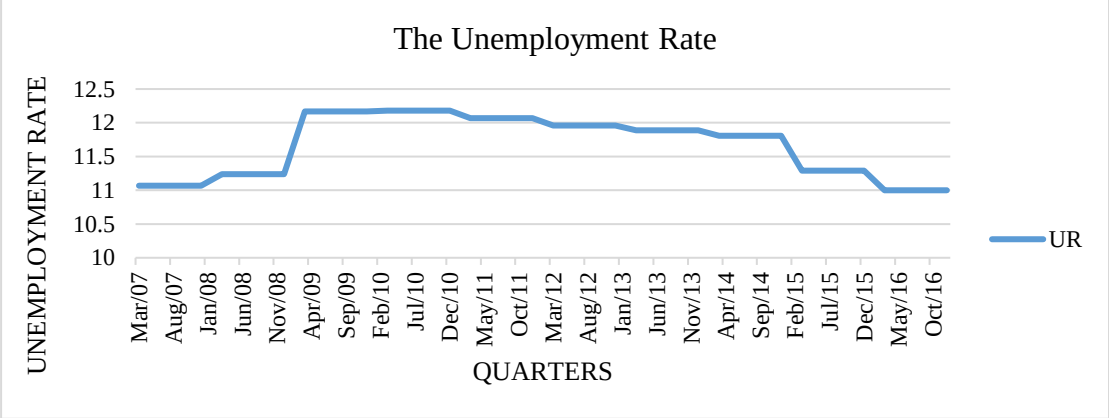
Figure 3 Line Graph of GDP mean growth rate from January 2007 to December 2016



Source: KNBS and Research Findings

The GDP mean rate had a mean of 4.88% with a standard deviation of 1.88%. The highest growth rate for the period of study was 8.3% and the lowest rate was 0.3% as depicted in figure 3 above. The GDP mean rate had the lowest growth in December 2008 but the economy gradually picked up and by March 2009 the rate increased to approximately 6.4%.

Figure 4 Line Graph of Unemployment Rate from January 2007 to December 2016



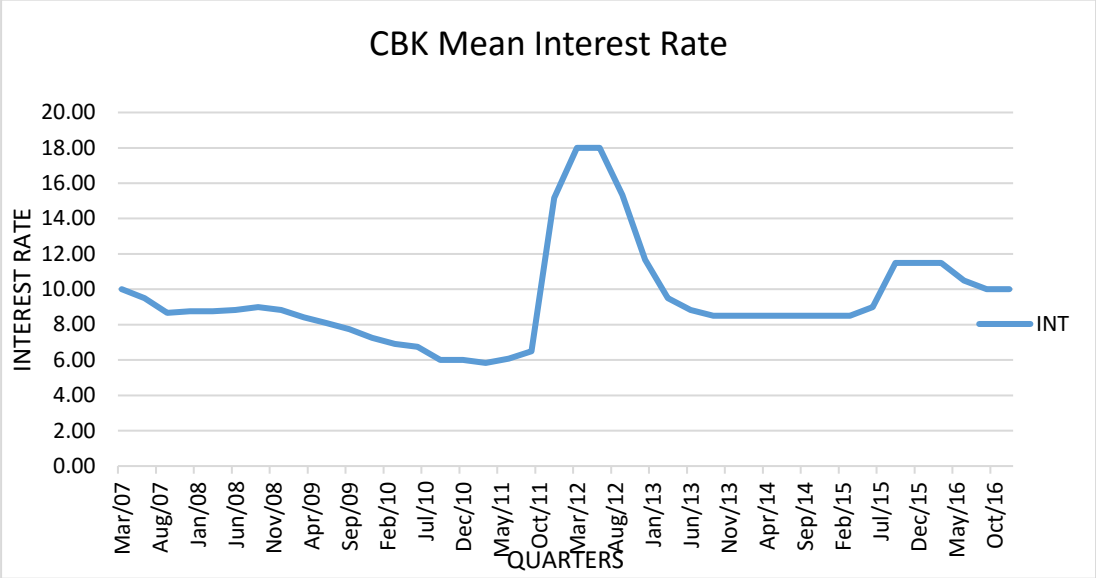
Source: World Bank and Research Findings

The unemployment rate had a mean of 11.67% with a standard deviation of 0.45% around the mean. The highest rate was 12.18% and the lowest was 11.00% for the period of study as depicted in figure 4 above. The Country's unemployment rate remained stable at around 11% for the period of study.

Figure 5 Line Graph of Interest Rate from January 2007 to December 2016

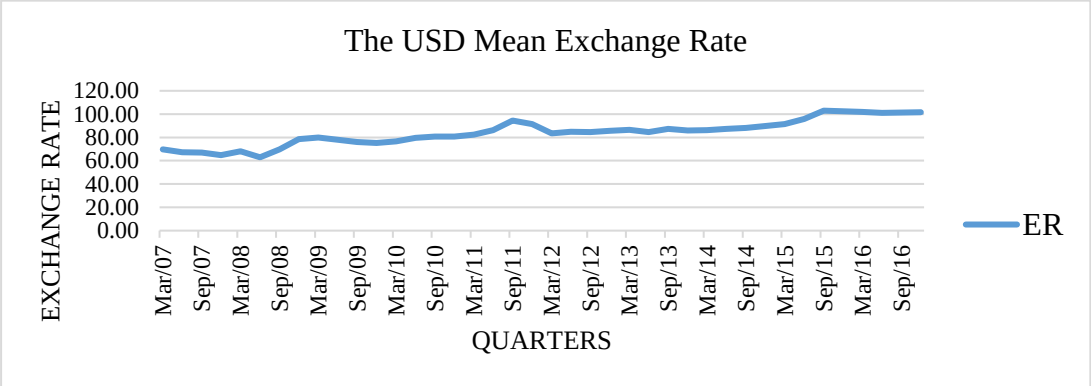
The Central Bank mean interest rate had a mean of 9.45% with a standard deviation of 2.88. The lowest rate was 5.83% and the highest rate was 18%. From figure 5 below it is observed that interest rates were fairly stable for the entire period of the study except for a duration of seven months from December 2011 to June 2012 when the rate hiked from 15.17% to 18% respectively. It reduced up to 9.5% in March 2013 before it rose again to settle at 11.5% in September 2015, and finally at 10% in September 2016

because of the Interest Rate Capping Regulation that became law on 14th September 2016.



Source: CBK and Research Findings

Figure 6 Line Graph of Foreign Exchange Rate (USD to KES) from January 2007 to December 2016



Source: KNBS and Research Findings

The mean foreign exchange rate against the Kenya shilling had an upward trend throughout the study period. The highest point was 102.97 and the lowest was 62.95 with a mean of 84.07 and a standard deviation of 11.04 Kenya Shillings

4.3 Results of Correlation Analysis

The Pearson's correlation coefficient was used to analyze data and determine the relationship between variables by use of correlation coefficient. The findings of the analysis are detailed in table 4.2 below.

Table 4. 2. Correlations Matrix

Correlations

		GDP Growth rate	Unemployment rate	CBK mean rate	USD Mean rate	NSE 20 share index
GDP Growth rate	Pearson Correlation	1	-.179	.037	.257	.360*
	Sig. (2-tailed)		.270	.819	.110	.023
	N	40	40	40	40	40
Unemployment rate	Pearson Correlation	-.179	1	-.140	-.073	-.334*
	Sig. (2-tailed)	.270		.387	.656	.035
	N	40	40	40	40	40
CBK mean interest rate	Pearson Correlation	.037	-.140	1	.232	-.245
	Sig. (2-tailed)	.819	.387		.150	.128
	N	40	40	40	40	40
USD Mean exchange rate	Pearson Correlation	.257	-.073	.232	1	-.300
	Sig. (2-tailed)	.110	.656	.150		.060
	N	40	40	40	40	40
NSE 20 share index	Pearson Correlation	.360*	-.334*	-.245	-.300	1
	Sig. (2-tailed)	.023	.035	.128	.060	
	N	40	40	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

a. Dependent variable: NSE 20 share index

b. Predictor variables: GDP mean growth rate, Unemployment rate, CBK Mean interest rate, USD mean exchange rate

Source: Research Findings

From the analysis, all the variables have a linear effect on shares prices. However, it was noted that unemployment rate had a significant negative influence on share price whereas GDP had a significant positive influence on the share price at 0.05 significant level. Interest rate and foreign exchange rate had a negative impact on share prices.

Table 4. 3. Collinearity Diagnostics

Collinearity Diagnostics[a]

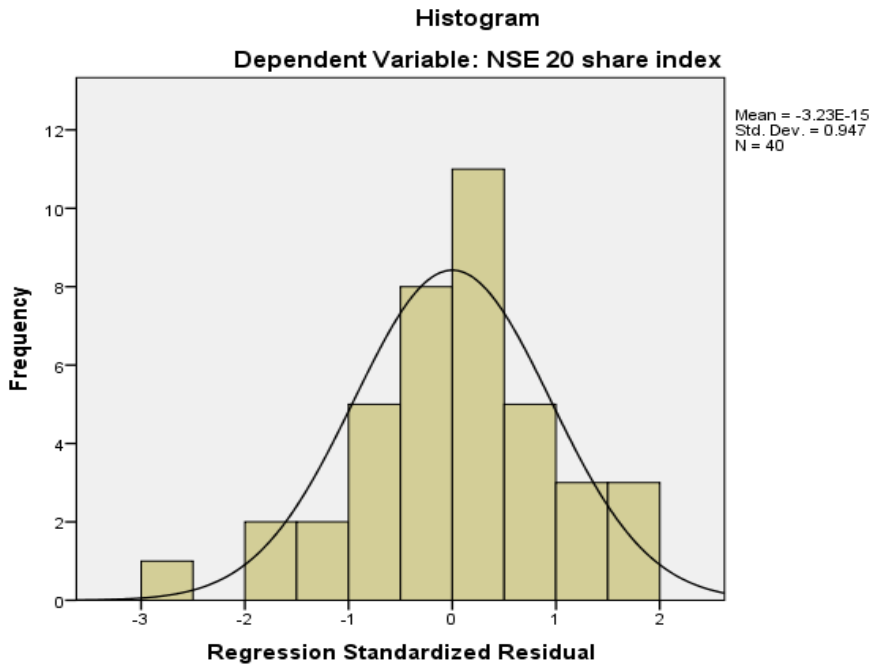
Model	Dimension	Eigen value	Condition Index	Variance Proportions				
				(Constant)	GDP Growth rate	Unemployment rate	CBK mean interest rate	USD Mean exchange rate
1	1	4.824	1.000	.00	.00	.00	.00	.00
	2	.108	6.697	.00	.79	.00	.15	.00
	3	.057	9.187	.00	.14	.00	.80	.02
	4	.011	20.994	.01	.04	.02	.02	.97
	5	.001	86.400	.98	.03	.98	.03	.02

a. Dependent Variable: NSE 20 share index
b. Predictor variables: GDP mean growth rate, Unemployment rate, CBK Mean interest rate, USD mean exchange rate

Source: Research Findings

The predictors are not highly related as seen from the calculated eigenvalue where the values are not very close to zero.

Figure 7 Normal Probability Chart



Source: Research Findings

The standardized residuals were found to be normally distributed as seen from the normal probability chart above.

4.4 Regression Analysis

The multiple regression analysis was used to establish the relationship between the dependent and independent variables. The goodness of the model was also tested and the results discussed below.

4.4.1 Model Goodness of Fit

Table 4. 4. Results of Model Goodness of Fit

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.648[a]	.419	.353	620.56929	.419	6.321	4	35	.001	.440

a. Predictors: (Constant), USD Mean exchange rate, Unemployment rate, CBK mean interest rate, GDP Growth rate

c. Dependent Variable: NSE 20 share index

Source: Research Findings

The relationship between the dependent and independent variable was found to be positive at 64.8%, where 41.9% of variations in share price is explained by fluctuations in GDP, unemployment, interest and foreign exchange rates. It implies that 58.1% of changes in the share price is explained by other factors not included in the model. A higher calculated F statistic value of 6.321 and a p-value of less than 0.01 validates the model, and therefore it can be applied with certainty to predict the value of the dependent variable.

4.4.2 Results of Analysis of Variance (ANOVA)

Regressing of the model resulted in a 9,737,345.201 sum of squares and a mean of 2,434,336.300 at 4 degrees of freedom. The sum of squares as a result of residuals is 13,478,718.518 with 39 degrees of freedom and mean of 385,106.243. The p-value was less than 0.05 thus significant at 5% level of significance.

Table 4. 5. Analysis of Variance (ANOVA)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9737345.201	4	2434336.300	6.321	.001[b]
	Residual	13478718.518	35	385106.243		
	Total	23216063.719	39			

a. Dependent Variable: NSE 20 share index

b. Predictors: (Constant), USD Mean exchange rate, Unemployment rate, CBK mean interest rate, GDP Growth rate

Source: Research Findings

The calculated F value of 6.321 is higher than the F critical value of 2.64 and a lower F-significance of 0.001 at 5% level of significance implies that the regression model is good. The selected macroeconomic variables are significant in explaining variations of the share price. The model can be used to predict the outcome of the dependent variable.

4.4.3 Estimated Model

The estimated coefficients of the regression model are presented in table 4.6 below

Table 4. 6. Estimated Model Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	12600.231	2850.526		4.420	.000	6813.355	18387.107		
	GDP Growth rate	167.349	55.514	.408	3.015	.005	54.650	280.049	.907	1.103
	Unemployment rate	-548.326	227.347	-.319	-2.412	.021	-1009.865	-86.788	.950	1.052
	CBK mean interest rate	-58.115	35.782	-.217	-1.624	.113	-130.755	14.526	.929	1.076
	USD Mean exchange rate	-26.384	9.567	-.378	-2.758	.009	-45.807	-6.961	.885	1.130

a. Dependent Variable: NSE 20 share index
b. Predictors: (Constant), USD Mean exchange rate, Unemployment rate, CBK mean interest rate, GDP Growth rate

Source: Research Findings

The coefficients of the model show the path of the relationship between the dependent and independent variables. The signs of coefficients of independent variables are in agreement with the theoretical assumptions that growth in GDP has a positive relationship with the share price whereas an increase in the rates of unemployment, interest and foreign exchange have a negative impact on the share price. According to the calculated p-values of the predictor variables, the degree of impact is significant for all the variables except interest rate which has a less impact with a p-value greater than 0.05. The direction of the influence of macroeconomic variables on share price is

further supported by the standardized coefficients which confirm that there is an inverse relationship between share prices and unemployment, interest rate and foreign exchange rate.

4.5 Discussion of Research Findings

The descriptive statistics calculated the mean of share price to be 4,252.17 with a maximum price of 5,4311.77 and minimum of 2,826.23. The standard deviation of the mean price was minimal at 771.55. The means and standard deviations of the other predictor variables respectively were GDP was 4.88 and 1.88, the unemployment rate was 11.67 and 0.45, the CBK mean interest rate was 9.45 and 2.88 and the USD foreign exchange rate was 84.07 and 11.04.

The Pearson correlation coefficient between the variables and the share price were negative for three predictors and positive for one predictor. The coefficient on unemployment rate was negative 0.334, interest rate had a negative 0.245 and the foreign exchange rate had a negative 0.300, while the GDP mean growth rate had a positive correlation of 0.360 at 0.05 significance level. The results are in agreement with the theoretical assumption that interest rate and foreign exchange rate are inversely related to the share price.

The multiple regression models revealed that 41.9% of changes in share price is attributable to changes in the selected macroeconomic variables. This implies that 58.1% of variations in share prices are explained by other macroeconomic factors not included in the model.

The ANOVA resulted in an F-statistic of 6.321 and a significance of 0.001 at 0.05 significance level. The calculated F value was checked against the F-critical values using the F-tables, 4 degrees of freedom and 35 observations and found to be higher

than 2.64 at 0.05 significance level and 3.91 at 0.01 significance level. The regression model was therefore found to be statistically significant in predicting the share price.

The model coefficients predicted the direction of the relationship between share price and the predictor variables. Results of the study revealed that a unit change in GDP growth rate would cause an increase in the share price of 167.349 units, one-unit change in unemployment rate would result in a reduction of 548.326 units in share price and one-unit change in interest rate would result in a reduction of 58.115 units in share price. A unit change in the foreign exchange rate would result in an adverse change of 26.384 units in share price. It was evident from the results that unemployment rate had the highest negative unit change in share prices than interest rate and foreign exchange rate. Holding all other factors constant at zero would result in a share price of 12,600.231 units.

The VIF statistic was used to test for collinerity amongst the selected variables. The values of the VIF were less than 5 for all the predictors implying absence or lower presence of multicollinearity. The computed VIF values of GDP rate, unemployment rate, interest rate and exchange rate were 1.103, 1.052, 1.076, and 1.130 respectively. A rule of thumb commonly used in practice is if VIF is >10, then there is a high presence of multicollinearity. The VIF also validated the goodness of fit of the multiple regression models.

The results on the effect GDP has on share prices at the NSE, were positively significant at 0.05 significance level. The results supported those of (Mutuku & Ng'eny, 2015; Mwai, 2011; Shiblee, 2009) who concluded that GDP had the strongest favorable relationship with the share prices at the NSE.

The results on unemployment rate indicated that they had a negative significant influence on the share prices of firms listed at the NSE on 0.05 significance level. These results are in agreement with those of (Flannery & Protopapadakis, 2002) which revealed that announcement of information about unemployment had a strong risk factor in influencing the daily market returns. However, the findings of the study contradicted those of (Shiblee, 2009) who concluded that unemployment had a weak influence on share prices of most companies on NYSE.

According to the results of the study, interest rate had a negative influence on the share prices of firms listed at the NSE. It was revealed that interest rate had an inverse relationship with share price where a unit increase in interest rate would result in a reduction of 58.115 units of the share price. The findings contradicted those of Mumo (2017) who concluded that interest rate and foreign exchange rate had a positive correlation with share prices in the NSE.

The findings on the influence of USD foreign exchange rate on share prices revealed that there was a negative influence at 0.05 significance level. The findings support the investigation by Kitati, Zablon, and Maithya (2015) on share prices of companies listed with NSE that exchange rate of hard currencies (Euro and USD dollar), inflation and interest rates adversely affected the movement of stock prices.

The findings of the study were in agreement with the APT proposition and EMH that macroeconomic variables are determinants of share prices and stock market returns, therefore, changes in these variables affect share prices instantaneously.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary findings of the study carried out to establish the effect of macroeconomic variables on share prices of firms listed in the NSE. It also presents the limitation of the study and suggestions for further research. The conclusions and recommendations of the findings are enumerated below.

5.2 Summary Findings

The objective of the study was to establish whether a relationship exists between the selected macroeconomic variables i.e. gross domestic product, producer price index, the unemployment rate, CBK mean interest rate, USD mean foreign exchange rate and share prices of firms listed in the NSE. The independent variables were investigated to establish their influence in predicting share prices. The producer price index variable was dropped because it didn't have sufficient data to undertake the study. It was noted that Kenya envisioned the need to compute the PPI index in June 2011 but the actual computation started from the second quarter of the year 2012.

From the results of the multiple regression models, it was concluded that all the four variables GDP, unemployment rate, interest rate and foreign exchange rate had a joint effect of 41.9% in influencing the variation of share prices in the NSE. It was inferred that 58.1% of fluctuation in the share price was explained by other macroeconomic factors that were not included in the study.

The results of the Pearson correlation statistic revealed that GDP had a positive significant influence on share prices at 0.05 significance level. The remaining three variables, unemployment, interest rate and foreign exchange rate had a negative

influence on the share price. The impact of the unemployment rate on share price was significant at 0.05 significance level. It was concluded that except for GDP, all the three variables had a negative impact on share prices of firms listed in the NSE.

The VIF statistic of collinearity revealed that the predictor variables did not exhibit the presence of muliticolinearity. The VIF values were computed as 1.103 for GDP, 1.052 for unemployment, 1.076 in respect of interest rate and 1.130 in respect of foreign exchange rate. All the values were less than 10 hence within the acceptable range of non-multicollinearity.

The results of the analysis of variance computed a high F-statistic of 6.321. The computed F-value was compared with the critical F-value from the F distribution table and the critical value was 2.64 at 0.05 level of significance and 3.91 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 price.

The model coefficients revealed that for a unit change in GDP, share prices would increase by 167.349 units, a unit change in unemployment rate would cause the share price to reduce by 548.326 units, a unit change in interest rate would cause a reduction in share price by 58.115 units, while a unit change in USD foreign exchange rate would cause a reduction in share price by 26.384 units. It was concluded that unemployment rate, interest rate, and foreign exchange rate had a negative influence on share prices. Only the GDP had a positive influence on share prices.

5.3 Conclusions

The study concluded that only 41.9% of variations in share prices were explained by variations in the selected macroeconomic factors. The combined effect of all the four

variables had a moderate effect on share prices. It was evident from the study that there were other factors which contributed to the movement of shares prices not included in the research. Share prices of firms listed in the NSE were positively affected by growth in GDP and negatively affected by changes in unemployment rate, interest rate, and foreign exchange rate. It was concluded GDP had a significant positive effect on share prices, CBK mean interest rate and USD foreign exchange rate had a negative effect on share prices, while unemployment rate had a significant negative effect on share prices of firms listed in the NSE. There is an inverse relationship between share prices of firms listed in the NSE and unemployment rate, interest rate and foreign exchange rates.

The results inferred that a growing economy measured by GDP would boost stock prices and stock returns in the capital market, expand market capitalization and boost investors' confidence in the capital markets. The study implied that economic growth underpins the development of capital markets and therefore a key determinant in augmenting the performance of the stock market.

5.4 Recommendations for Policy

The study recommends to the government to support economic activities that favorably impact on the growth of the economy through the formulation of policies that would allocate resources to value adding activities aimed at industrializing our country and boost returns in the stock market.

The Central Bank should formulate monetary and fiscal policies that will ensure stable interest rates are maintained to avoid suppressing the economy through increased costs of doing business that erode profits which would otherwise be invested in the stock market. Those policies formulated by CBK should safeguard the value of the shilling

to ensure that it appreciates against the major currencies thus strengthening the economy and growth of the stock market.

The government through the Ministry of Industrialization and Enterprise Development and the Ministry of Public Service, Youth & Gender Affairs should formulate policies that support industrialization by fabricating value adding equipments and organizing value adding cottages that create markets and employment for the youth. Value addition activities boost the economy through improved products and services, market linkages and synergies and creation of employment to the working age group. Attempts to reduce unemployment levels will boost the performance of the stock market through the growth of economic activities and better prices of stock.

5.5 Limitations of the study

The study relied on secondary data from the KNBS, CBK and World Bank which was collected for other uses and not necessarily for this study hence it could not be reflective of the actual scenario at the time of the study. The other limiting factor was that data available from the KNBS website was not accurate, there were many conflicting figures which made it difficult to determine which data set to use in the study. Information from different publications within the Bureau for the same period had conflicting data which posed a risk of non-reliability and validity of the data source. There was limited data available for one of the variables i.e. the PPI that caused the variable to be dropped from the study.

5.6 Recommendations for Further Research

There exist conflicting results on which macroeconomic factors really affect share prices and the performance of stock markets in both emerging and developed capital markets. This study used four predictor variables i.e. GDP, unemployment, interest

rates and foreign exchange rates. These are not the only macroeconomic variables that affect the performance of the stock market.

The study recommends that further research should include other variables not included in this study that have an impact on the share prices of firms listed in the NSE.

The duration of the study could be increased to focus on a long term effect of more than 10 years. From the empirical studies reviewed during the research project, it was evident that long run studies had a near uniform conclusion with other studies than the short run.

The study used multiple regression models to analyze data in the SPSS. Other data analysis tools and models should be used to determine the effect of macroeconomic variables on share prices.

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APPENDIX 1: LIST OF CONSTITUENT FIRMS-NSE 20 SHARE INDEX

S/N	FIRM
1.	Sasini Limited
2.	Kenya Airways Limited
3.	Nation Media Group
4.	Scan Group Limited
5.	Centum Investment Company Limited
6.	Kenya Commercial Bank Limited
7.	The Co-operative Bank of Kenya Limited
8.	Standard Chartered Bank Limited
9.	Barclays Bank of Kenya Limited
10.	Equity Bank Limited
11.	Cfc Stanbic Holdings Limited
12.	East African Breweries Limited
13.	British American Tobacco Kenya Limited
14.	Athi River Mining Limited
15.	Bamburi Cement Limited
16.	Kenolkobil Limited
17.	Kenya Power Limited
18.	Kenya Electricity Generating Company Limited
19.	British-American Investments Company (Kenya) Limited
20.	Safaricom Limited

APPENDIX 2: LIST OF LISTED COMPANIES AT THE NSE

	Agricultural
1	Eaagads Ltd
2	Kapchorua Tea Co. Ltd
3	Kakuzi
4	Limuru Tea Co. Ltd
5	Rea Vipingo Plantations Ltd
6	Sasini Ltd
7	Williamson Tea Kenya Ltd
	Automobiles And Accessories
8	Car and General (K) Ltd
9	Sameer Africa Ltd
	Banking
10	Barclays Bank Ltd
11	CFC Stanbic Holdings Ltd
12	I&M Holdings Ltd
13	Diamond Trust Bank Kenya Ltd
14	HF Group Ltd
15	KCB Group Ltd
16	National Bank of Kenya Ltd
17	NIC Bank Ltd
18	Standard Chartered Bank Ltd
19	Equity Group Holdings
20	The Co-operative Bank of Kenya Ltd
	Commercial And Services
21	Express Ltd
22	Kenya Airways Ltd
23	Nation Media Group
24	Standard Group Ltd
25	TPS Eastern Africa (Serena) Ltd
26	Scangroup Ltd
27	Uchumi Supermarket Ltd
28	Longhorn Publishers Ltd
29	Atlas Development and Support Services
30	Deacons (East Africa) Plc
31	Nairobi Business Ventures Ltd
	Construction And Allied
32	Athi River Mining
33	Bamburi Cement Ltd
34	Crown Berger Ltd
35	E.A.Cables Ltd

36	E.A.Portland Cement Ltd
	Energy and Petroleum
37	KenolKobil Ltd
38	Total Kenya Ltd
39	KenGen Ltd
40	Kenya Power & Lighting Co Ltd
41	Umeme Ltd
	Insurance
42	Jubilee Holdings Ltd
43	Sanlam Kenya PLC
44	Kenya Re-Insurance Corporation Ltd
45	Liberty Kenya Holdings Ltd
46	Britam Holdings Ltd
47	CIC Insurance Group Ltd
	Investment
48	Olympia Capital Holdings Ltd
49	Centum Investment Co Ltd
50	Trans-Century Ltd
	Investment
51	Home Afrika Ltd
52	Kurwitu Ventures
	Investment Services
53	Nairobi Securities Exchange Ltd
	Manufacturing And Allied
54	B.O.C Kenya Ltd
55	British American Tobacco Kenya Ltd
56	Carbacid Investments Ltd
57	East African Breweries Ltd
58	Mumias Sugar Co. Ltd
59	Unga Group Ltd
60	Eveready East Africa Ltd
61	Kenya Orchards Ltd
62	Flame Tree Group Holdings Ltd
	Telecommunication And Technology
63	Safaricom Ltd
	Real Estate Investment Trust
64	Stanlib Fahari I-REIT
	Exchange Traded Fund
65	New Gold Issuer (RP) Ltd

APPENDIX 3: RAW DATA

Quarters	GDP Mean Growth Rate	Unemployment Rate	CBK Mean Interest Rate	USD Mean Exchange Rate	NSE 20 Share Index
Mar-07	7.10	11.07	10.00	69.68	5,431.77
Jun-07	8.30	11.07	9.50	67.28	5,098.87
Sep-07	6.30	11.07	8.67	67.08	5,227.67
Dec-07	6.40	11.07	8.75	64.69	5,216.77
Mar-08	1.10	11.24	8.75	67.99	4,876.10
Jun-08	2.20	11.24	8.83	62.95	5,232.47
Sep-08	2.60	11.24	9.00	69.76	4,565.83
Dec-08	0.30	11.24	8.83	78.41	3,416.47
Mar-09	6.40	12.17	8.42	79.89	2,826.23
Jun-09	2.00	12.17	8.08	78.01	2,982.43
Sep-09	1.90	12.17	7.75	75.95	3,127.10
Dec-09	0.90	12.17	7.25	75.28	3,173.53
Mar-10	4.70	12.18	6.92	76.70	3,755.87
Jun-10	4.80	12.18	6.75	79.64	4,271.43
Sep-10	6.00	12.18	6.00	80.66	4,508.00
Dec-10	7.40	12.18	6.00	80.84	4,496.00
Mar-11	5.40	12.07	5.83	82.40	4,197.33
Jun-11	3.40	12.07	6.08	86.33	4,025.00
Sep-11	4.00	12.07	6.50	94.59	3,480.00
Dec-11	4.60	12.07	15.17	91.52	3,289.00
Mar-12	4.20	11.96	18.00	83.54	3,298.33
Jun-12	4.30	11.96	18.00	84.76	3,634.00
Sep-12	5.00	11.96	15.33	84.61	3,890.00
Dec-12	4.70	11.96	11.67	85.71	4,121.00
Mar-13	6.10	11.89	9.50	86.50	4,599.00
Jun-13	7.50	11.89	8.83	84.49	4,789.67
Sep-13	6.40	11.89	8.50	87.26	4,759.67
Dec-13	3.50	11.89	8.50	86.02	4,988.00
Mar-14	5.20	11.81	8.50	86.33	4,911.67
Jun-14	6.00	11.81	8.50	87.25	4,905.33
Sep-14	4.60	11.81	8.50	88.27	5,100.33
Dec-14	5.60	11.81	8.50	89.88	5,154.67
Mar-15	5.80	11.29	8.50	91.50	5,349.67
Jun-15	5.60	11.29	9.00	95.84	4,928.33
Sep-15	6.10	11.29	11.50	102.97	4,251.33
Dec-15	5.50	11.29	11.50	102.38	3,975.00
Mar-16	5.30	11.00	11.50	101.93	3,862.00
Jun-16	6.30	11.00	10.50	101.03	3,839.33

Quarters	GDP Mean Growth Rate	Unemployment Rate	CBK Mean Interest Rate	USD Mean Exchange Rate	NSE 20 Share Index
Sep-16	5.70	11.00	10.00	101.34	3,303.67
Dec-16	6.10	11.00	10.00	101.73	3,228.00