EFFECT OF INFLATION ON STOCK MARKET RETURNS AT NAIROBI SECURITY EXCHANGE

BY

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DECLARATION

I hereby declare that this Research Project is my original work and has not been presented to any other institution of learning or examining body, for the award of an academic credit.

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This Research Project has been submitted for examination with my approval as University of Nairobi Supervisor

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DEDICATION

This study is dedicated to my family and friends who have supported me throughout my studies and ensured this was a success. Thank you all for your contribution and may God bless you.

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LIST OF ACRONYMS AND ABBREVIATIONS

APT	Arbitrage Pricing Model
ARDL	Autoregressive Distributed Lag model
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
CMA	Capital market authority
ECM	Error Correction Mechanism
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
KNBS	Kenya National Bureau of Statistics
NSE	Nairobi securities exchange
P/E	Price Earnings Ratio
ROE	Return on Equity
ROI	Return on Investment
ROS	Return on Sales
SPSS	Statistical package for social sciences

ABSTRACT

The relationship between inflation and stock market returns has been investigated by several researchers around the world. The findings of investigations have recognized the existence of connection between stock market performance and inflation. However there has been various conflicting results. The specific objective of this investigation was to determine the influence that inflation has on returns of stock market at the NSE. The study utilised a descriptive case study research design covering a time period of seventeen years from 2000 to 2016.

Further the study investigated the influence of money supply, real GDP, interest rate and exchange rate on the returns of stock market. Secondary data was acquired from the NSE for stock market returns while for inflation, money supply, exchange rate, interest rate and GDP was obtained from CBK and KNBS. The data was collected and analysed using Stata version 12.0 and the result of the analysis presented in tables. The correlation results revealed a strong positive correlation for the stock market returns and the CPI. The results for the Philips- Perron test for unit roots showed time series for returns of the stock market and inflation were stationary after differencing them once. ARDL long-run regression findings showed that there is a positive but insignificant connection of inflation and stock market returns. The findings also revealed negative long-run connection for the real exchange rate and stock market returns and between real rate of interest and the stock market returns. Positive long-run connection was found between real supply of money and returns of stock market and between real GDP and returns of stock market at the NSE. ARDL short-run results showed that inflation rate positively influences stock market return at the NSE. The results also showed that real money supply do have strong positive influence on stock market returns at the NSE. The rest of the variables, real exchange rate, real rate of interest and real GDP does not have any significant influence on stock market returns at NSE for the short-run. The investigation revealed that economic growth is the most important determinant of stock market returns in Kenya in the long-run. The study recommended that the government should ensure that there is a stable macro-economic environment which will ensure high economic growth rate in the country. This will enable high returns to the investors in the stock market and spur further growth in different sectors of the economy.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Inflation and stock returns are two crucial indicators of a country's economy. An analysis of stock market returns and inflation connection is vital since a change in stock prices due to inflation influences the decisions of both the firms and investors. Despite many studies in the same field, it has not be ascertained whether inflation and the returns of stock market have a positive or negative connection (Eita, 2014). Persistent inflation impacts on the prices of stock and the eventual returns and the performance of other stock market indices (Ogunmuyiwa, 2015). Major macroeconomic factors including money supply, interest rates, Gross domestic Product, inflation and exchange rate determine stock returns. Rising variations in exchange rates, inflation, money supply and interest rates increases stocks returns' volatility resulting in more risks which compels the investors to switch their investments to portfolios which are less risky such bonds (Kirui, Wawire & Onono, 2014).

Some hypotheses have been formulated to demonstrate on how inflation and stock prices are connected. Depending upon the theory under consideration, stock prices can be affected by inflation either positively or negatively. Fisher (1930) opined that shares can be used as a shield to the inflation where a growth in the expected inflation results in a similar shift in the nominal share returns. However, Proxy theory by Fama (1981), asserts that the returns of stock market are negatively influenced by inflation since real activity and stock returns are positively linked and a negative association exists between real

activity and changes in price levels. The theory further suggests that the real rate of returns is unaffected by inflation since equities are a good hedge against inflation (Floros, 2003).

Most stock markets in developing countries, greatly contribute to the mobilization of economic resources both locally and globally so that to increase the economic potential of a country (Aliyu, 2011). As an economic institution, NSE has a fundamental responsibility in ensuring the enhancement of capital formation and allocation efficiency. Thus, level of efficiency and performance of the stock market determines the overall development of an economy (Kirui, Wawire & Onono, 2014). Volatility of stock markets threatens economic growth and efficient allocation of resources. It erodes investor confidence and can slow down the economic growth of a country (Amata, Muturi & Mbewa, 2016). Therefore, the study seeks to investigate and examine how inflation affects the performance of the NSE and can be used to provide decision making platform for both the policy makers and individual investors.

1.1.1 Inflation

Inflation rate is the increase in the overall price levels of commodities which remains steady over a given period of time in a country (Kariuki & Kagiri, 2016). Low or medium inflation levels in nation positively influence the business sector since it provides production incentives. Inflation is the persistent growth in the generally accepted price levels which causes the rise in cost of living in a country thus reducing the living standards of the general public rendering them poor (Hussain & Malik, 2011).

Inflation is a measurement of changes in the prices of certain commodities in a purposeful and fixed consumption basket of goods and services (Mukiza, 2011). Macroeconomists, central bankers and policy makers from both developing and developed nations still have a keen interest in explaining the phenomenon of inflation (Hussain & Malik, 2011). High rate of inflation creates uncertainties in the economy, due to which the investors are afraid of investing on capital goods (Adhikari, 2014). The risks associated with assets rises with increasing inflation which increases the expected investors' rate of return since higher risks are associated with higher uncertainty in inflation. A strong connection exists between inflation and stock market returns (Shiblee 2009).

The Consumer Price Index (CPI) is an index for measuring inflation in Kenya. It measures the average price variations of the consumer commodities. The CPI can be measured monthly, quarterly or annually. Talla (2013) in his study adopted the CPI to measure inflation where he noted both positive and negative effects of inflation on stock market. He also stated that the expected and unexpected inflation dictate the associations between inflation and stock market.

1.1.2 Stock Market Returns

Stock market returns are associated with micro economic factors like business growth, profits, the announced dividends among others that are related to a specific company (Reddy, 2012). Stock returns are the benefits or losses of the value of a share in a particular period usually quoted as a percentage.

It consists of capital gains as well as any income collected by the investor from the stock (Mugambi & Okech, 2016). Relating to the time of occurrence, stock returns are termed as profits when trading or dividends when issued to its shareholders by the business (Osoro, Wanjare, Ooko & Oluoch, 2017). According to (Ibrahim& Agbaje, 2013), Stock market returns dictates the efficiency and effectiveness in the allocation of shares and equities by the stock market on the basis of availability and preference of market information.

Various stakeholders are interested in stock market returns. Researchers policymakers, government and investors have since used the stock market returns in the making various forecasts, constructing portfolio strategies, determining policy implications and developing regulatory rules. The overall understanding of the trends of stock trading is essential in the evaluation of the financial market events and overseeing economic growth. Similarly, funds are required by the government for the delivering of social amenities and infrastructural development. The execution of these activities involves long term capital commitment that can only be generated by a proper-functioning stock market.

The stock market returns measures include; market capitalization, stock turnover and stock market indexing. Kithinji and Ngugi (2009) asserts that random selection of a variety of stocks from the basket market should generate a rate of return same as that of the market to the investor.

In market capitalization, the market trends are measured by ascertaining the total stock value in specific stock market by summing up the quoted stocks' market value. Market turnover is based on the actively traded shares and it shows the inflows and outflows in the stock market. Panu & Peng (2010) undertaken a research at Thailand Stock Market to demonstrate the importance of market capitalization through undertaking an analysis of the differences and similarities of the returns of non SET50 (small market capitalization) portfolios and SET50 (large market capitalization) returns portfolios. A positive association was established between market capitalization and stock return.

1.1.3 Effects of Inflation on Stock Market Returns

The Fisher hypothesis (Fisher, 1930) asserts that a positive association must either exist between stock return and inflation or be similar to the inflation rate for it to remain relevant. The implication of this theoretical assertion is that inflation and stock prices must have a positive connection and this must prevail at all times (Jepkemei, 2017). Fama (1981) explored the association between the prices of stocks and inflation and noted a negative association between the two variables. It was concluded from the study that an economic downturn is an indication of high inflation which forces firms to dispose their financial stock and thus it can be said that low stock prices and inflation go hand in hand (Farrukh, 2015).

Coleman and Tettey (2008) investigated Ghanaian stock exchange where they found a negative influence of inflation on the stock market performance. Their view was that higher inflation rates increases the standard of living costs and shifts resources from

instruments of stock markets to consumables thus reducing the market instruments' returns. They concluded that Inflation thus negatively influence the market index and the result of the exchange. A study by Munene (2007) on the NSE revealed returns of the stock market and anticipated inflation in Kenya are negatively connected. However, he outlined an association between actual inflation and stock prices which was positive. He argued that stock markets perform well under conditions of low inflation and strong boom in the economy.

1.1.4 Nairobi Securities Exchange

NSE formally established in the year (1954) as stock broker's voluntary association which was to aid in the generating financial resources and provide long term capital for the financing of investments and is registered under societies Act (NSE, 2010). The participation of the local investors at this initial stage was encouraged through the adoption of a regulatory system. Structural reforms in the financial markets were initiated by the International Finance Corporation (IFC) in liaison with the CBK in (1989) which resulted into the formation of the Capital Markets Authority (CMA). The CMA is mandated to aid the formation of a conducive environment for the expansion of the capital markets in the country. The NSE functions in collaboration with the Central Depository and Settlement Corporation (CDSC). The NSE has put in place many regulatory frameworks that seek to create an ideal stock market exchange which encourages efficient capital allocation to allow for free transition of price discovery as dictated by the market forces.

According to Kirui, Wawire and Onono (2014), remarkable changes in inflation has been seen in the Kenyan economy over time. CPI rose by 0.95 percent from 137.96 to 139.28 in April 2013. As a result of these changes, stock returns were subsequently affected. According KNBS (2016), CPI rose from 173.85 points in November 2016 to 175.18 points in December 2016. The rate of the overall inflation fell from 6.68 per cent to 6.35 per cent in the same year. The NSE 20 share index fell from 3,247 points in November 2016 to 3,186 points in December 2016, while the overall number of shares traded decreased from 461 million shares to 289 million shares during the same year. The total value of NSE shares traded dropped from KSh 10.44 billion in November 2016 to KSh 7.11 billion in December 2016. Due to inflationary pressure, the NSE 20 share index has been rising and falling steadily over the years.

Ndwiga and Murui (2016) states that in recent past, the establishment of the NSE has seen a rise in the market returns lifting the stock market index from 4133 points in December (2012) to 4970 points as at the end of October (2013) which was contrary to the Dow Jones industrial average. There was also a rise in the Market Capitalization from KES 1.3 trillion as at the end of October (2012) to KES1.8 trillion as at the end of October (2013) and a further rise to KES 2 trillion in March 2014 giving a 41% cumulative rise.

According to Olweny and Omondi (2010), the NSE 20-share listing revealed sharp decline to 3531 points by end of Dec 2008. The NSE 20 Share listing declined by 7.8% to stand at 3,247 points in December 2009 in contrast to 3,531 points December 2008. The

NSE 20 share index rose steadily over the first three quarters of 2010 to reach a maximum of 4,630 marks during the third quarter.

1.2 Research problem

Inflation has a diverse effect across the economic spectrum in any country. For instance, inflation will impact on the cost of conducting business. Inflation affects analysts, investors, economists and policy makers. A country's economy could totally be derailed by inflation. It affects the stock market which greatly contributes to economic growth.

Stock returns volatility disrupts smooth function of NSE because it reduces the investors' confidence. There has been an upward and downward trend in the NSE share index. The unstable nature of the NSE results in an over-sensitivity of stock returns to macro-economic factors. According to Kimani and Mutuku (2013), an increase in inflation makes goods expensive because it raises their prices. This will lead to decrease in consumption levels in the economy thereby reducing the profits of companies, and also their respective share prices at the NSE. This will weaken the performance of the stock market. Stable stock prices would attract investors and improve the performance of NSE.

Several investigations have been done in the surrounding of US, Lintner (1975), Schwert and Fama (1977), Fama (1981), Modigliani and Cohn (1979), Roll and Geske (1983)) and European economies (Asprem, 1989). The negative effect of inflation on real stocks was evident from these studies, but did not elaborate the inflation influence to the stock market returns. Uwubanmwen and Eghosa (2015) explored the inflation rate impact on Nigerian stocks market returns. The study sorted to establish the influence of inflation on

Nigerian stocks market returns and to determine the extent to which the stock prices can be used to predict market returns. A negative insignificant association was found between the rate of inflation and stocks return meaning inflation isn't effective in predicting the Nigerian stock returns. Alagidede (2009), explored the connection the stock prices have to inflation and noted a positive connection for inflation and the stock returns in Kenya. However, Mutuku and Ng'eny (2015) in their research of association of macro-economic factors and the Kenyan stock market found a negative link between NSE performance and Inflation.

The different studies highlighted above yielded different findings which could be due to different sets of variables applied, varying methodologies among other factors. The varying results of this matter necessitate the need for more insight on the connection that inflation has on stock market return. The study poses the question: What is the effect of inflation on stock market returns at the Nairobi Securities Exchange?

1.3 Research Objective

To establish the effect of inflation on stock market returns at the Nairobi Securities Exchange.

1.4 Value of the Study

Stock market's role in the expansion of a nation's commerce and industries cannot be under-estimated. The stock market opens a platform for the collection of funds from the investors and avails the tools for them to invest the collected surplus funds. Price

volatility is a normal trend at the NSE, as the stock prices are influenced either negatively or positively by various indices both within and outside the economic systems. The investigation was designed to ascertain the influence of inflation on the returns of stock market at the NSE.

This study's findings will be beneficial to potential investors, policy makers and academicians. The proposed investment strategies will be of use to both the local and foreign investors and any other interested stake holder. The knowledge of the connection that inflation has on the returns of the stock market will also result in effective positioning at the market by all the investment intermediaries in case there is a surge in inflation. In addition, decision making on additional investments, retaining and withdrawal of investment levels could be explained by the influence of inflation on stock.

Academicians will also understand better the influence that inflation have on stock market returns which will clear the current contradiction that exists in literature between these two factors thus the research findings will add knowledge to the existing literature.

Findings of this research will also be beneficial to the regulators to understand how to contain inflation within the acceptable limits and understand its influence on investment, reactions to interest rates and production levels which is mandatory in the analysis of monetary policies. The Forecast on inflation findings will also enable the government to understand the economic variables with useful information regarding the rate of inflation which is then used to regulate its activities

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Previous studies literature undertaken by various scholars on inflation and stock market returns is presented in this chapter. The chapter examines the theories and concepts of the connection between inflation and the stock market returns. It similarly highlights the studies that have been undertaken by different scholars on inflation and stock market returns that lead to the research gap. The hypothesis and conceptual framework of the study is built through analysing the previous literatures from different authors on influence of inflation on stock market returns at the NSE.

2.2 Theoretical Review

Theoretical review is based on theoretical foundation of the study developed by researchers to explore the effects of inflation on the returns of the stock market.

2.2.1 Inflation Illusion Hypothesis

This theory was advanced by Modigliani & Cohn (1979) who opined that inflation illusion is built as a result of great associations between inflation rates and stock market returns. They hypothesized that money illusion greatly influence the market investors since real cash flows are discounted using nominal discount rates and therefore the stock are under-priced during higher inflation rates and over-priced when the rates of inflation are lower. Cohn and Modigliani hypothesis is generally used to imply that investors

suffer from behavioural problems that result in inflation-induced valuation errors (Wilcox, 2012).

The study by Ritter and Warr (2002) was in line with the inflation illusion hypothesis since the undervaluation of leveraged equities due to the mistakes committed in the use of real capitalization and nominal rates led to the commencement of the bull market in 1982. Another study by Campbell and Vuolteenaho (2004) utilized data of between 1927 and 2002 and noted mispricing that was inflation-induced thus giving more credit to the illusion hypothesis. However, Lung and Wang (2009) found that while inflation illusion can explain the level of stock mispricing, it does not explain the volatility of mispricing. From this theory, the implication is that Inflation could be linked with the attitudes of the investors toward risk, which negatively influences stock prices.

2.2.2 Fisher Hypothesis

The Fisher effect argues that the change in the nominal asset returns changes with the anticipated inflation accordingly so that real factors independent of the inflation rate determine stock returns. The Fisher (1930) asserts that assets representing claims to physical assets for instance stocks needs to be positively linked with expected inflation which mitigates the rising prices.

Studies by Boudoukh and Richardson's (1993) were in agreement with the Fisher Hypothesis on the connection of stock market returns and inflation. This study was

conducted in the US and UK on the basis of the returns of the period from 1802 to 1990. The Fisher Effect has however received critics from studies by various scholars.

A negative connection on stock prices and inflation has been documented by Schwert and Fama (1977), and Mandelker and Jaffe (1976). According to Mishra and Singh (2011), the negative association between prices of stock and inflation is brought about by the rise in inflation which makes the standard stock valuation model discount rate higher implying that stock market returns should be negatively influenced by inflation.

The implication of this theory is that an increase in the expected inflation other factors being constant leads to an increase in the nominal returns in an ideal trading where the current and expected inflation extents is reflected by prices, hence inflation and stock returns change systematically. The fact that assets should at all times maintain their values against inflation leads to positive associations between inflation and stock returns.

2.2.3 The Proxy Hypothesis

The Proxy Hypothesis Fama (1981) was initiated to clarify the negative connection of stock market prices and inflation and the indirect links between inflation and stock prices with economic activity. The Proxy hypothesis by Fama asserts that because of the positive connection of stock market returns and intended growth of the economy, as the inflation rises, the real economic growth slows down which increases its volatility thus compelling the investors to acquire high levels of premiums to suppress the added risks (Olusifayo, 2013).

The Granger (1969) technique was employed by Cozier and Rahman (1988) to discover the mode of causality that exists for inflation and stock market returns connection. The study results in Canada were in line with the Proxy Hypothesis. The Vector Auto regression (VAR) residuals approach was also used by Lee (1992) to explore the dynamic interactions and Granger (1969) causality among the variables in the US. His results were in line with the Proxy Hypothesis by Fama. This theory was however criticized by Mc Queen and Roley, (1993) on the basis that negative associations between stock prices and real economic activities only occur under certain conditions. They argued that information with regard to a rise in economic activities increases stock prices in weak economies and reduces the stock prices in booming economies.

The implication of this theory is that high inflation leads to economic decline which encourages firms to dispose their stocks. A rise in stock supply similarly reduces the prices of stock. Since future earnings of the firm are indicated by its stocks potential, an anticipated fall in the state of the economy compels firms to dispose their financial stocks and thus exists a correlation between high inflation and low stock prices.

2.3 Determinants of Stock Market Returns

The section examines GDP, rate of interest, exchange rate and money supply as the main stock market returns' determinants.

2.3.1 Gross Domestic Product (GDP)

The market value of all the final goods and services domestically produced in a nation in a given year is termed as the GDP. Both income and output are measured by the GDP. The rising GDP in an economy ceteris paribus translates to higher income levels which yields higher individuals' disposable income. Therefore, there will be a higher demand for shares which is linked to the disposable income thus encouraging the investors to purchase more shares. The prices of shares increase with the demand for shares. Low levels of disposable income are recorded during sluggish economic conditions which negatively affects the disposable income. Lower GDP results in lack of employment, reduced disposable income and lower production levels for most workers which prompts the investors to withdraw their investments in stock. This will lead to fall in the prices of stock.

2.3.2 Interest Rate

According to Alam and Uddin (2009), an interest rate can be borrowing rate, lending rate or cost of capital. The implication being that interest rates negatively influences the stock market prices and that a negative connection of the returns of the stock market and interest rates exists. Peoples' demand of deposit is higher when the interest rates rise. This increases the borrowing cost leading to a decline in investment thus reducing the stock prices.

2.3.3 Exchange Rate

The ratio of the amount of units in which one currency can be used to purchase per unit of another currency is referred to as the Exchange Rate. When the exchange rate rises the prices of stock will fall as a result of the inflation expectations. Higher costs will also be experienced by large importer companies as a result of the weaker domestic currency thus they will incur lower share prices and earnings. Depreciation can therefore be said to negatively affect the stock market. The depreciation of the domestic currency is however beneficial to the investors since the foreign investors take advantage of the reduced prices of domestic products. Thus currency depreciation can be said to depress the import industry and boost the domestic export industry at macro-economic level. Thus either positive or negative associations is found influence of exchange rate and the prices of stock.

2.3.4 Money Supply

This is the amount of money circulating within a country at any given time. The prices of stock are positively affected by money supply growth. Higher money stocks in a country stimulate the economic growth in that it avails more credit to firms to allow for expansion of production which leads to higher sales returns thus increasing the firms' earnings. This therefore results in higher firm' dividend payments translating to higher stock prices. Negative associations also exist between money supply and prices of stock. The economic stimulus accrued due to money growth which increases stock prices and cash flows however counter this negative effect (Mukherjee & Naka, 1995).

2.4 Empirical Review

The section presents the investigations which have previously been done on inflation and stock market returns by various Scholars and Authors both globally and locally.

2.4.1 Global Review

Silva (2016) explored whether the stock prices are influenced by inflation in Sri Lanka. The study purpose was to investigate the influence of inflation rate of a country on the Stock prices during a period of ten years. Monthly inflation rate and All Share Price Index were used in developing a linear regression model. The study findings revealed the connection between Inflation rate and Stock prices was negative. Percentage change approach in the study disclosed a positive connection between the rate of Inflation and the returns of the stock market.

Yadav, Lama and Rajangahlot (2015) investigated the influence of inflation on the returns of the stock market for a span of 10 years at Karachi Stock Exchange. The aim of the study was to test both short-run and long-run dynamic connection of the inflation and stock market index. The study adopted the closing value of the month of the Karachi stock 300 index to represent the stock market returns for a monthly basis and inflation was measured using the Consumer price index. This study examined the monthly data of Karanchi stocks index as from December 2004, to December, 2014. The simple regression model was utilised in analyzing the associations of the independent variables and dependent variables. The dependent variable was stock index value while the independent variable was the CPI monthly values and one lag percentage differentials

value was used through the conversion of the two time series in analyzing the type of the stationary. It was established that a positive insignificant connection between inflation and the returns of stock market exist at Pakistan.

Olorunkele and Akoko (2014) investigated the effect of GDP growth, inflation rate and rate of interest on securities market returns from 1986 to 2012 using data of time series in Nigeria. By utilizing the granger causality, co-integration test, and the Ordinary Least Squares (OLS), the study's findings indicated the inflation rate, the NSE-All share index, real GDP and interest rate are connected in the long-run. They also noted the rate interest and output growth to significantly influence stock market performance and returns. The conclusions of the causality test were that there was a feed-back test arising from the NSE-All Share Index on real GDP and inflation rate which was in line with the Fisher effect.

Azar (2014) analysed determinants of US stock returns. The study's objective was to investigate whether uncertainty in inflation, the relative adjustment in the US dollar value and inflation influence the stock prices in the US. The stock market index was measured using the S&P 500 and the dollar measured using the US trade-weighted foreign exchange rate index. There was strong evidence that US inflation uncertainty and US inflation have no influence on the returns of stock market of the US.

2.4.2 Local Review

Mumo (2017) used the Johansen co-integration method to establish the influence of volatility of macroeconomic variables on stock prices through specific macroeconomic variables. The study was aimed at examining the influence of supply of money, inflation, rates of interest and exchange rates on the stock returns as per the share index of NSE. This study adopted data of time series from 1998 to 2015. Data analysis was then performed using the Vector Error Correction Model (VECM) and Johansen procedure to establish the existence of order 1(1) unit roots on the data collected. From the study, it was concluded that long-run associations exist between inflation and other macroeconomic variables and prices of stock and macroeconomic variables. Inflation was noted to have insignificantly negative association. Interest rates and Exchange rates showed a positive association. The results revealed a negative long-run equilibrium connection between money supply and stock prices exist.

Mugambi and Okech (2016) explored the macroeconomic variables impact on the stock market returns of banks at the NSE. The purpose of the investigation was to undertake an empirical analysis using the correlation and Root test to ascertain the multicollinearity and stationarity respectively of key economic variables and bank stock returns. They used exchange rate, interest rate, inflation and GDP for the analysis. Secondary data from secondary sources was used in the research. Quarterly data of time series over the period of study from 2000 to 2015 was used. A linear regression model using Ordinary Least Squares (OLS), under fixed effects model was utilised to compute the regression

coefficients between bank stock returns and the different macroeconomic factors affecting the same. Empirical results showed that interest rate, exchange rate and inflation significantly influence the bank stock returns, while GDP had an insignificant effect at 5% level of significance.

Kitati, Evusa and Maithya (2015) explored the influence that some macro-economic variables that included: inflation rate, foreign exchange rate and interest rates of hard currencies had on fluctuations of share prices using the cumulative monthly average data from 2008 January to December 2012 data for companies in the NSE listing. The study utilized secondary data from the NSE and CBK. The influence of the chosen Macro economic variables on companies' share prices in the NSE listing were examined using the Simple and Multi- variate regressions analysis. It was noted that interest rate impact on prices of the stock was higher than that of other macroeconomic variables. The stock indices for the companies in the NSE listing were also negatively influenced by the rate of interest and exchange rate for both the US Dollar and Euro. Inflation rate was noted to negatively impact on the stock market performance indicating that higher inflation rate levels lead to lower indices of the Kenyan stock market.

A research by Muriu and Ouma (2014) explored the macro-economic variables influence on the Kenyan stock prices between the year 2003 and 2013. Data analysis was performed using the CAPM and APT. The OLS technique was utilised to ascertain the relative importance of different variables that could affect the stock returns and to test the models' validity. The Kenyan stock market returns were noted to be greatly affected by Inflation, Supply of Money and Exchange rates. The most significant determinants of

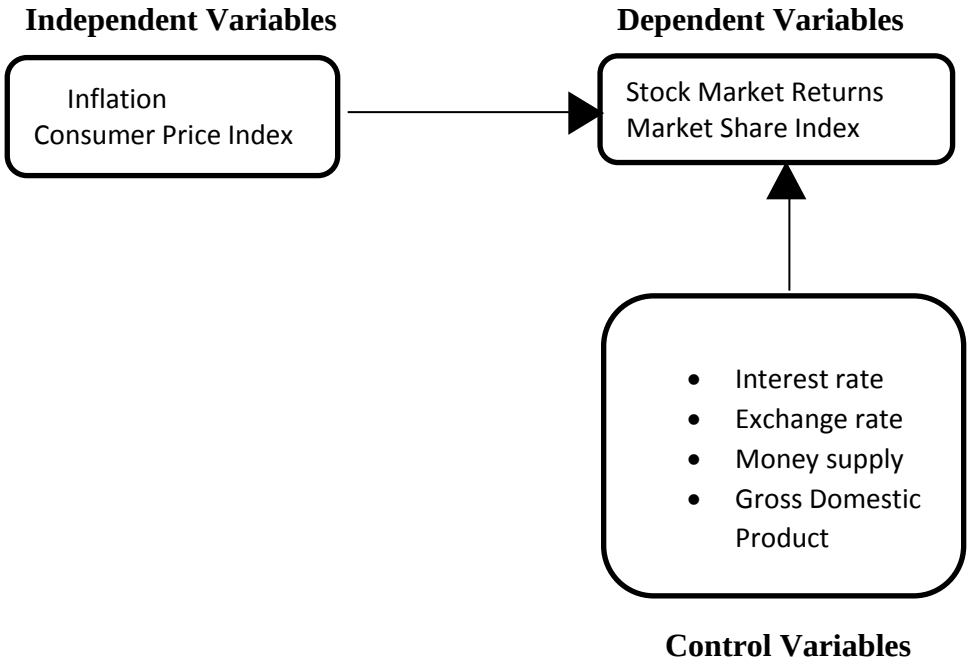
NSE returns were inflation and money supply. The Exchange rate was found to affect stock returns negatively whereas the interest rates was not significant in influencing the NSE long-run returns.

Aroni (2011) analysed the factors affecting prices of stock for listed firms at the NSE in using inflation, exchange rates, interest rates and money supply for 3 years from January 2008 to December 2010. He used secondary data from the NSE, CBK and KNBS. He applied multiple regression formula to estimate the influence of the chosen variables on the prices of stock. From the results of regression it was noted that factors of inflation, exchange rates, and interest rates were significant except money supply which even though had a positive connection, the connection was not significant. The result showed that exchange rate and interest rate had negative connection to stock prices whereas inflation and money supply had a positive connection.

2.5 Conceptual Framework

Conceptual framework is a graphical representation of the major factors, concepts, or variables under study and expected connection for them. For this study the inflation (measured as consumer price index) is the independent variable while share index acts as a market return' proxy. Exchange rate, rate of interest, money supply and GDP are used as controllable variables. Figure 2.1 below demonstrates the conceptual framework of the investigation.

Figure 2.1 Conceptual Framework



Source: Researcher 2017

2.6 Summary of Literature Review

This investigation was designed to establish the influence inflation on the stock market returns at NSE. Various studies have been done and continue to be done on inflation and the stock market returns connections. The inflation illusion hypothesis, Proxy hypothesis and Fisher hypothesis were reviewed in this chapter. The Inflation Illusion hypothesis asserts that during high inflation, great undervaluation of stock prices occurs and overvaluation of stock prices occurs during low inflation due to failures by the investors to acknowledge the nominal dividend growth rates connection with inflation and thus extrapolate the historical nominal growth rates even times of changing inflation.

According to the Fisher hypothesis, the claims against business' real assets are represented by equity stocks which could help with the mitigation of inflation. This will increase the nominal stock market returns which compensates the investors for the rise in the price levels .While the Proxy Hypothesis indicates associations between stock returns and inflation do not illustrate the real situation, but only approximates the associations between stock returns and the Gross National Product (GNP) growth rate with the converse associations between the stock returns and inflation rates.

This chapter has also reviewed the past studies and the findings have been inconsistent based on Country where the Stock market is located, time period of the study and the procedure adopted for the study. Under the global empirical review, Silva (2016) and Azar (2014) found the connection inflation to the returns of the stock market to be negative. While Yadav, Lama and Rajangahlot (2015), Olorunkele and Akoko (2014), Issahaku, Utarz and Domaban (2013) noted that market returns of stock and the inflation rate have a positive link. Under the local empirical review, Mumo (2017), Kitati, Evusa & Maithya (2015) noted the correlation between inflation and securities market returns to be negative. Mugambi and Okech (2016), Ouma & Murui (2014), Aroni (2011) found a positive relationship.

From the above theoretical and empirical reviews, it shows that there are conflicting results. Also most of the studies have been done by combining inflation with other macroeconomic variables to establish the relationship instead of establishing the influence of inflation on stock market returns independently.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter reviews the methodology used to collect data for the study. It describes the research design, sample design, population, data collection and data analysis.

3.2 Research Design

A research design is the roadmap through which the study will be executed so as to adequately respond to the research questions (Kothari 2004). The study adopted a descriptive case study design. This approach does not test the predicted associations between variables but rather describes the variables. Descriptive case study design helped to answer the research question which was utilised to investigate the influence of inflation on the returns of the stock market at the NSE.

3.3 Data Collection

Secondary data was utilised in the study. NSE 20 share Index was used to measure stock returns which was be obtained from the NSE. Inflation data was expressed using CPI. The data on Exchange rate, inflation, Gross Domestic Product, Money Supply and interest rates were acquired from the CBK and the KNBS. The quarterly data was for the period of 17 years from January 2000 to December 2016.

3.4 Data Analysis

Statistical software stata version 12.0 was utilized to analyse data. Relationships between the variables was assessed and presented using tables. The study used ARDL model of regression analysis to investigate the influence of the independent variables on the dependent variable.

3.4.1 Analytical Model

To capture the connection of inflation and the returns of stock market in Kenya. The following model is specified:

$$lnSM_t = \beta_0 + \beta_1 INF_t + \beta_2 ER_t + \beta_3 IR_t + \beta_4 lnMS_t + \beta_5 lnRGDP_t + \varepsilon_t \quad (1)$$

Where

SM_t −Stock market returns, measured using NSE 20 share index. The quarterly stock returns will be calculated using this formula = Ending value/ Beginning value-1.

INF_t −Inflation Rate measured using the quarterly consumer price index.

ER_t −Real Exchange Rate measured using quarterly average Kenya shilling per unit of US dollar.

IR_t −Real Interest Rate measured using quarterly weighted average lending rate by commercial banks.

MS_t −Real Money Supply measured using quarterly broad money supply (M3).

$RGDP_t$ −Real GDP measured using quarterly economic growth rate expressed in local currency.

ε_t −Error term

ln −Natural log

$\beta 1$ - $\beta 5$ -Regression Coefficients

3.4. 1.1 ARDL Specification

To capture the connection of inflation and stock market returns, an appropriate econometric method to employ is the cointegration and error correction model. Therefore, Autoregressive Distributed Lag (ARDL) approach, also known as bounds test approach to cointegration, which was popularized by Pesaran and Shin (1999), and Pesaran et al. (2001) was used in this study. ARDL model is therefore formulated from equation 1 as:

$$\Delta(ln(SM_t)) = \beta_{01} + \beta_{11}INF_{t-1} + \beta_{21}ER_{t-1} + \beta_{31}IR_{t-1} + \beta_{41}lnMS_{t-1} + \beta_{51}lnRGDP_{t-1} + \beta_{61}lnSM_{t-1} + \sum_{i=1}^{p}\alpha_{1i}\Delta(ln(SM_{t-i})) + \sum_{i=1}^{q}\alpha_{2i}\Delta(INF_{t-i}) + \sum_{i=1}^{q}\alpha_{3i}\Delta(ER_{t-i}) + \sum_{i=1}^{q}\alpha_{4i}\Delta(IR_{t-i}) + \sum_{i=1}^{q}\alpha_{5i}\Delta ln(MS_{t-i}) + \sum_{i=1}^{q}\alpha_{6i}\Delta ln(RGDP_{t-i}) + \varepsilon_{1t} \quad (2)$$

Where Δ the difference operator, q is the lag length and ε_{1t} error term which is presumed to be uncorrelated. The ARDL technique involves two steps. In the first step, the null hypothesis of no co-integration connection is defined as $H_0 = \beta_{1i} = \beta_{2i} = \beta_{3i} = \beta_{4i} = \beta_{5i} = \beta_{6i}$ and is tested against the alternative $H_1 \neq \beta_{1i} \neq \beta_{2i} \neq \beta_{3i} \neq \beta_{4i} \neq \beta_{5i} \neq \beta_{6i}$ for $i = 1, 2, 3, 4, 5, 6$ of the existence of future connection. The co-integration test is founded on the F-statistic. According to Pesaran et al. (2001) critical values of two sets of significance level can be determined. All the variables I (0) are in the Lower Critical Bound and are believed not to have co-integration among them, and the upper bound presupposes that all the variables are I (1). At the first level calculations assume that all

variables included in the ARDL model are integrated of order zero, while at the second one the calculation is based on the assumption that the variables are integrated of order one. The null hypothesis should not be accepted if the calculated F is more than the upper critical bound because this will mean that there exists a co-integration connection among the variables. If the F-statistics falls below the lower critical bound value, it implies that there is no co integration connection.

3.4.2 Test of Significance

The statistical significance was established in the study using the d, adjusted R^2 and F tests. The d-test was utilised to test the autocorrelation between the variables in the study. The adjusted R^2 was utilised to know the goodness of fit of the regression model. F test was utilised in testing the overall significance of the regression model.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The findings and discussion on the influence of inflation on the stock market returns at the NSE based on quarterly data over the period 2000-2016 are presented in this chapter. This period is considered long enough to make proper statistical inference and it was also based on data availability. First, it involves establishing the descriptive characteristics and correlation of all the variables involved in the study. Secondly, it presents results on unit root using Phillip-Perron (PP) test so identify stationary variables in order to avoid the problem inconsistent estimates which arise due to non-stationary series. Lastly, to analyse the time series data, Autoregressive distributed lag (ARDL) approach to co-integration is also carried out to establish how each of the variables affects the stock market returns and whether the long-run relationship exists.

4.2. Descriptive Statistics

Table 1.1: Descriptive Statistics of Selected Variables

Variable	Mean	Std. Dev	Skewness	Kurtosis	Min	Max	Obs
SI	3636.08	1430.97	0.41	1.50	1046.40	8982.09	68
CPI	99.11	39.08	0.39	-1.20	46.73	173.89	68
ER	80.87	9.62	0.68	0.26	62.65	103.89	68
IR	16.01	2.80	0.69	-0.32	12.17	23.76	68
MS	1049240.15	769758.82	0.87	0.47	306683	2761842	68
RGDP	381672.56	137877.10	1.18	0.33	230418	756821	68

Notes: SI-Stock market returns; CPI; ER-Real exchange rate; IR-interest rate; MS-Real money supply and RGDP-Real GDP.

Table 4.1 shows the descriptive statistics of all the variables used in the estimation in this study. The average share index (stock market return) is 3636.1, while the minimum is 1046.4 and maximum is 8982.1, this indicates a wide spread in returns at the stock exchange market. The consumer price index has an average of 99.11, a minimum value of 46.7 and a maximum value of 173.9, which indicates a wide range. The average real money supply during the 2000-2016 period is 1049240.2 million, with a minimum value of 306683 million and a maximum value of 2761842 million, it has very wide range showing a progressive growth in real money supply in the recent years. The ER, IR and RGDP have an average of 80.1, 16 % and 381672.6 million respectively.

Standard deviation is a statistical measure used to quantify the amount of dispersion of a set of data from its mean. The real money supply and GDP had the highest standard deviations of 769758.8 and 137877.1 respectively. This shows that the two variables have very high volatility, this is because supply of money is dictated by the discretion of the Central Bank while real GDP is determined by several macroeconomic factors. The share index has a standard deviation of 1431, which is also relatively high showing high volatility of the stock market returns in NSE. It suggests that on average, the stock market returns deviates from the mean by about 1431(Shs). The CPI (inflation) is used as a proxy for macroeconomic stability, it has a standard deviation of 39.1, implying that on average, the CPI will deviate from the mean by about 39.1 units. Real exchange rate has a standard deviation of 9.6, which relatively small, however, real interest rate has the smallest standard deviation of 2.8. It shows that real interest rate has very low volatility during the period under consideration.

Skewness is a measure of symmetry. From the descriptive test results in Table 4.1, all the variables have a positive skew, implying that all the distributions have long right tails. However, the skewness values for all the variables range from 0.4 to 1.2, this shows that they have near normal distribution. The kurtosis is the standardized fourth population about the mean, it shows the variables' distributions in terms of peakedness. All the variables have a kurtosis of less than 3, which is Platykurtic distribution.

4.3 Correlation Analysis

The value which measures the degree in which two variables are connected is called the correlation coefficient. The value of correlation coefficient ranges from 0 to 1 in absolute terms. A value of 1.0 shows a perfect positive connection of the two variables while a value of -1.0 means there is a perfect negative relationship between the two variables. Table 4.2 shows the correlation results.

Table 4.2: Correlation Matrix

	lnSI	**CPI**	**ER**	**IR**	**lnMS**	**lnRGDP**
lnSI	1					
CPI	0.635**	1				
ER	0.138	0.757**	1			
IR	-0.444**	-0.020	0.262*	1		
lnMS	0.657**	0.988**	0.720**	-0.035	1	
lnRGDP	0.633**	0.972**	0.759**	-0.049	0.947**	1

** Correlation is significant at the 0.01 level (2-tailed).

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

Table 4.2 shows the correlation matrix. There is a strong positive correlation between stock market returns (SI) and the consumer price index. A positive correlation is also observed between real money supply and real GDP. This implies that growth in money supply and higher economic growth leads to higher stock market returns in Kenya. However, negative correlation between the stock market returns and the real interest rates is shown and this is significant, implying that higher real interest rate leads to lower stock

market returns. Real exchange rate however is positively, but insignificantly correlated with the returns of stock market at the NSE. A strong positive correlation between real money supply and CPI which is strong, this confirms a theoretical notion of higher real money supply leads to higher inflation. Real money supply also has a strong positive correlation with real GDP, this could operate through the investment channel, and that is, higher supply of money leads to lower interest rates which lead to higher investments and eventually growth.

4.4 Phillips-Perron Test for Unit Roots

The study uses time series data of quarterly type, most of the time series variables are non-stationary. Non stationary series is a variable whose mean and variance is time dependent. On the other hand, stationary series has a constant mean and variance which implies that it displays a change in the mean because it shifts around a constant mean and has a finite variance which is time-invariant.

One of the econometric problems in empirical analysis is Non-stationarity data of time series. Running a regression while some factors in the model are non-stationary is likely to lead to spurious regression and inconsistent results and therefore inferences based on such data are likely to be meaningless. Due to this econometric problem, the variables in the models were tested for unit roots using Phillips-Perron test (a generalization of the Augmented Dickey-Fuller (ADF) procedure). Table 4.3 shows the results.

Table 4.3: Phillips-Perron Unit Root Test Results

Variable	Test Statistic (Level)	P-Value (Level)	Test Statistic (Differenced)	P-Value (Differenced)	Order of Integration
lnSI	-0.487	0.8946	-3.450	0.0094	I (1)
CPI	3.204	1.0000	-3.295	0.0151	I (1)
ER	1.029	0.9946	-3.583	0.0061	I (1)
IR	-2.967	0.0381	-	-	I (0)
lnMS	0.527	0.9857	-3.361	0.0124	I (1)
lnRGDP	2.320	0.9990	-3.019	0.0331	I (1)

From the findings in Table 4.3, only (IR) is stationary at 5 percent significance level and therefore of order zero (I (0)) integration. The rest of the variables: lnSI, CPI, ER, lnMS and lnRGDP are of order one (I (1)) integration and were found to be stationary after differencing them once.

4.5 Post-Estimation Diagnostic Tests

4.5.1 Heteroscedasticity Test

Heteroscedasticity is a violation of the belief of OLS of constant variance. In the presence of heteroscedasticity, the estimates are still unbiased, but the variance of estimated coefficients is affected, underestimated or overestimated, which can lead to the type-I or type-II error. The solutions depend on the pattern of heteroscedasticity. One of the ways of correcting for heteroskedasticity is to run a heteroscedasticity robust regression. The

study used Breusch-Pagan-Godfrey test to test for heteroscedasticity, the results are presented as:

Ho: Constant variance

Table 4.4: Heteroscedasticity Test Findings

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

χ^2 (1)	= 1.84
Prob> χ^2	= 0.1749

The null hypothesis states that a constant variance is there. The results show that the p-value is 0.1749, more than 0.05; hence, null hypothesis of constant variance is accepted and conclude that there is homoscedasticity.

4.5.2 Multicollinearity Test

Variance Inflation Factor (VIF) is utilized to test for multicollinearity. It is used to determine the speed at which the variances and covariance's increase. It helps us determine which variable is inflating the variance and hence causing multicollinearity. The mean of VIF is similar to the critical value for multicollinearity. Any variable whose VIF is greater than the mean VIF is responsible for creating multicollinearity and if less than the mean VIF, then it's not a cause.Table 4.5:

Multicollinearity Test Results

Variable	VIF	1/VIF
dlnRGDP	11.27	0.0887
dlnMS	10.66	0.0938
dER	2.57	0.3896
IR	1.17	0.8524
dINF	1.10	0.9086
Mean VIF	5.35	

The results in Table 4.5 show that the mean VIF is 5.35. The variables differenced real GDP and differenced real money supply have a VIF which is more than the average 5.35, this shows that they are the cause of multicollinearity in the model.

4.5.3 Test for Serial Correlation

Autocorrelation is a situation where the error terms of different time periods are correlated. It is the violation of the property of independence of error terms under the OLS assumptions. In case of Durbin–Watson statistic being substantially less than 2, there is evidence of positive serial correlation while if d statistic is greater than 2 then we have negative correlation. The study employed Durbin Watson and Breusch-Godfrey LM tests for autocorrelation. However, the Durbin Watson test does not assume higher order autocorrelation. In order to deal with this the Breusch-Pagan test was used to solve the problem. The results are shown in Table 4.6

H0: no serial correlation

Table 4.6: Autocorrelation Test Results

Test	Lags(p)	χ^2	df	Prob> χ^2
Breusch-Godfrey LM	1	5.149	1	0.0233
Durbin's Alternative	1	1.013	1	0.3142
Durbin-Watson	d-statistic (6, 16) = 1.4110			

Table 4.6 show autocorrelation findings. The p-value is 0.0233, less than 0.05, hence the no serial correlation is rejected for the null hypothesis. On the other hand, using the Durbin's autocorrelation alternative test, the p-value is 0.3142, greater than 0.05, this means that the no autocorrelation accepted is for null hypothesis, implying the model has no serial correlation. However, using Durbin-Watson d-statistic, the value is 1.4110, which is less than 2, this implies that there is positive correlation. The conclusion is that the model has autocorrelation and this was corrected during estimation.

4.5.4 Ramsey Specification Test

A multiple regression model is affected by functional form misspecification when it can't properly account for the connection for the dependent and observed explanatory variables. This leads to inconsistent biased parameter estimates ($\widehat{\boldsymbol{\beta}}_{\mathbf{i}}$), that is, the coefficients of the slope can be seriously swayed, either too low or too high. This can lead to under or overestimation of the connection of variables and conclude incorrectly

that a coefficient is insignificant or significant. Ramsey (1969), suggested a general functional form misspecification test, regression specification error test (RESET) which is designed to display if there are any ignored nonlinearities in the model. The test indicates whether there are important omitted variables or not. The Ramsey specification test was performed and the findings presented in Table 4.7.

Table 4.7: Ramsey Specification Test Results

Ramsey RESET test using powers of the independent variables

Ho: Model has no omitted variables

F (15, 45)	= 0.54
Prob> F	= 0.9054

The test is based on the no omitted variables in the null hypothesis. The results in Table 4.7 reveals the p-value to be 0.9054, and greater than 0.05. This shows that we fail to reject the null hypothesis and make a conclusion that the model has no important omitted variables and that it is sufficient to explain the data generating process.

4.6 Co-integration Analysis

Having established that in the study, there were variables which were I (0) and others I (0), what follows is to confirm whether the there is an existence of a long-run relationship between the dependent (stock market returns) and the explanatory variables. A suitable econometric methodology is to use co-integration together with error correction model. Therefore, ARDL (bounds test approach to co-integration) is utilized in this study.

The ARDL proposition has some important strengths that the Engle-Granger (1987) and maximum likelihood-based technique developed by Johansen and Juselius (1990) and Johansen (1991) co-integration approach does not have: First, the bounds test pre-testing of the series is not necessary to determine their order of integration since the test can be conducted regardless of whether they are purely an I (0) or I (1). Second, it has adequate number of lags which addresses autocorrelation and endogeneity problems. Third, modelling ARDL incorporates small sample properties over Johansen and Juselius (1990). Lastly the Error Correction Model (ECM) can be obtained through a simple linear transformation, which integrates the short run adjustments with long-run equilibrium without losing long run information. The associated ECM model takes a sufficient number of lags to capture the data generating process in general to specific modelling frameworks" (Nkoro and Uko, 2016). This study used the bounds test for cointegration and the results are shown in Table 4.8

Table 4.8 Bounds Test Results for Cointegration Relationship

Test Statistics	Value	Significance Level	Bounds Critical values	
F-Statistics	**4.263**		**I(0)**	**I(1)**
		1%	**3.41**	**4.68**
		5%	**2.96**	**4.18**
		10%	**2.62**	**3.79**

From the results Table 4.8 the value of F-statistic is 4.263 which is larger than the upper critical bound (4.18) at 5percent level of significance. This implies that there exists a long-run relationship linking the stock market returns and the explanatory variables in the model.

4.7 Regression Findings for the Long-run ARDL Model

The bound test for cointegration revealed that the stock market returns and the regressors in the model have a long-run relationship. Therefore, ARDL model was utilized for the long-run parameters estimates of the model. Akaike Information Criteria (AIC) was used for the optimal lags selection of the model in the form AIC (1, 0, 1, 0, 0, 0). This means that AIC selected the ARDL model with 1 lag for dependent variable and the independent variables (inf, er, ir, lnms and lnrgdp) were included in their level and selected lags of 0, 1, 0, 0 and 0 respectively. 0 lags of an independent variable means it will be added to list of regressor in level only. ARDL regression was done and the results presented in Table 4.9

Table 4.9 ARDL Long-run Regression Results Based on AIC (1, 0, 1, 0, 0, 0)

Dependent Variable: lnSM **Method: ARDL Regression**

Variable	Coefficient	Std. Error	t-Ratio	P-Value
inf	0.0056	0.0064	0.87	0.389
er	-0.0238	0.0056	-4.28	0.000
ir	-0.0405	0.0118	-3.43	0.001
lnms	0.3638	0.1178	3.09	0.003
lnrgdp	0.7375	0.3025	2.44	0.018
cons	-3.9340	2.5267	-1.56	0.125
Adj R^2 =	**0.8477**	**N**	**= 66**	
Log likelihood =	**8.063**	**Root MSE**	**= 0.2284**	

The adjusted R^2 (Adj. R^2) is adjusted for the degrees of freedom. It is 0.8477, meaning that 84.77 percent differences seen in stock market returns are explained by the variables included in the model. This is a good fit since it explains a large variation in the dependent variable, while 15.23 percent of the differences seen in the stock market returns are described by other variables not included in the model.

4.8 Short-Run Dynamic Regression Results

An estimation of ECM is done to explore the dynamics of short-run model of regression with the information of the cointegrating relationship. The Table 4.10 reveals the findings of the estimated model of error-correction for determinants of stock market returns in

Kenya by applying the ARDL approach. The optimal lags for the model were selected based on the AIC.

Table 4.10: ARDL Short-run Regression Findings Based on AIC (1, 0, 0, 1, 0, 1)

Dependent Variable: lnSM **Method: ARDL Regression**

Variable	Coefficient	Std. Error	t-Ratio	P-Value
Δinf	0.0217	0.0110	1.9706	0.077
Δer	-0.0156	0.0313	-0.4991	0.629
Δir	0.0299	0.0366	0.8164	0.433
Δlnms	1.063	0.5648	1.8820	0.089
Δlnrgdp	0.3617	0.7809	0.4632	0.653
ecmL1	-0.3274	0.1203	-2.7214	0.022
cons	2.3867	5.1393	0.4644	0.644
Adj R^2 = 0.7978		**N = 67**		
F-Stat = 6.3132 (0.007)		**AIC = 14.5948**		
Log likelihood = 22.5948		**Root MSE = 0.2443**		

Notes: **ΔX_i**-Variable is differenced.

The F statistics tests the overall significance of the regression model. It is used to test the null hypothesis that all the regression coefficients are equal to zero. The F-statistic for the regression model is 6.3132, it is significant at 1 percent significance level implying that the all the regressors are statistically significant and different from zero. The value for the adjusted R^2 is 0.7978, this implies that 79.78 percent of the short-run variations for the returns of stock market are explained by the variables included in the model. This shows

a good fit, while 20.22 percent of the variations in the stock market returns in the short-run are explained by the factors not included in the model.

4.9 Interpretation of the Findings

The results of long-run regression demonstrate a negative relationship between exchange rate and stock market returns. Holding other variables in the model constant, a 10 percent rise in real exchange rate cause a 0.2 percent decline in the stock market returns, this is significant at 1 percent significance level. This is consistent with the findings by Muriu and Ouma (2014), but contradicts the findings by Mumo (2017).

Also a negative connection exists between real interest rate and stock market returns in the long run. This implies that at 1% level of significance, an increase in real interest rates by 10% in the previous period leads a reduction in returns of stock market by 0.4%. This is consistent with the findings of Aroni (2011), but contradicts the findings by Mumo (2017).

A growth in supply of money has a positive effect on returns of stock market at 1percent significance level. If all other variables in the model are held constant, a 10% growth in real money supply leads to a 3.6 % increase in returns of stock market. Theoretically, growth in supply of money leads to an increase in stock market returns because it stimulates economic growth of a country. This is consistent with the findings by Aroni (2011), but contradicts the findings by Mumo (2017).

Increase in real GDP of a country additionally influences the Kenya's stock market returns. The findings of the long-run regression display a positive connection for economic growth and stock market returns in Kenya. If Kenya's economy grows by 10%, then the stock market returns increases by 7%, holding other variables in the model constant. This shows that real GDP being part of the largest determinants of stock market returns in Kenya. This is because improvement in economic conditions in a country creates a favorable environment for investors in the economy. Inflation however, does not influence the long run stock market returns. The findings demonstrate a positive but insignificant connection of inflation and Kenya's stock market returns.

The findings of the short-run regression show positive influence on stock market returns by inflation exist in Kenya. At 10% level of significance, a 10% growth in inflation rate cause a 0.2% increase in the stock market returns in the short-run. Theoretically moderate inflation in the short-run period is associated with easy profits which are then reflected in the increase of value of market returns of stock. The outcome of the analysis is consistent with the findings of Aroni (2011), Muriu and Ouma (2014) and Mugambi and Okech (2016), but contrasts the findings by Kitati, Evusa and Maithya (2015) and by Mumo (2017).

Increase in real money supply in the previous period has strong positive effect in returns of the stock market in the short-run. Holding other variables in the model constant, a 10 percent growth in real money supply leads to a 10.6 percent growth in stock market returns in Kenya. Growth in supply of money is associated with a fall in real interest rates

which makes credit affordable for investors. Therefore, results reveal a positive effect of increase in real supply of money on the returns of the stock market in Kenya.

The error correction term (ecmL1) shows how the adjustment mechanism works to return to equilibrium condition when it is disturbed by exogenous shocks which lead to changes from the long-run equilibrium. It should be negatively signed, indicating a move back towards equilibrium. The results indicated that coefficient estimated is correctly signed -0.3274 (negative) and statistically significant at 5 percent. This is an indication that system corrects its previous period disequilibrium at a speed of 32.74 percent on quarterly basis. This means the speed of adjustment is 32.74 percent implying that 32.74 percent of disequilibrium is corrected in the first quarter, that is, within the first three months. The disequilibrium in this case can arise from inflation, political instability, adverse weather effects and other calamities. The implication is that disequilibrium can persist for extended period of time, hence explaining the significance of the lagged effects on stock market returns.

Real exchange rates, real interest rate and real GDP do not significantly influence stock market returns for the short-run. Theoretically, the effect of economic growth usually takes time before they are experienced in the economy. This could explain why economic growth as measured by real GDP has no impact on prices of stock in the short-run but only long-run effect.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary, conclusions and recommendations of the findings of the study. This study examined the effect of inflation on stock market returns in Kenya using quarterly data of time series over the period 2000-2016 using ADRL approach to cointegration to analyse the data.

5.2 Summary of the Findings

The objective of the study was to determine the effect of inflation on stock market returns at the NSE. Quarterly data from 2000 to 2016 was collected from NSE for the stock market returns and from CBK and KNBS for inflation, money supply, GDP and exchange rate.

Correlation analysis was done for all the variables. The result show a strong positive correlation between the stock market returns and CPI. A strong positive correlation between stock market returns and real money supply and real GDP is also revealed. The results show a significant negative connection of stock market returns and real rates of interest. Real rate of exchange however, had a positive but not significant correlation with stock market return.

The variables were tested for unit roots using Phillips-Perron test and the results revealed only one variable real interest rate was stationary at 5 percent level of significance. Other factors were found to be stationary after differencing them once.

Holding other factors constant, regression findings of the long-run ARDL reveals that at 1 percent significance level, the connection between real exchange rate and stock market returns in the long-run is negative. There is also a negative long-run relationship between real interest rate and stock market returns. The long-run relationship between real money supply, real GDP and stock market returns revealed a positive relationship. The results for inflation showed an insignificant positive connection with stock market returns in Kenya.

ARDL short-run regression results revealed Kenya's stock market returns is positively influenced by inflation. And holding other variables constant, the short-run results revealed a positive influence of real supply of money on returns of stock market in Kenya. Real rate of exchange, real rate of interest and real GDP however, does not significantly in the short-run affect stock Kenya's market returns.

5.3 Conclusion

The study aimed to explore empirically the influence of inflation on stock market returns at the NSE as well as other variables likely to influence the returns of the stock market. In order to achieve the objectives, this study used CPI as a proxy for inflation. By using modern econometric techniques such as Phillip-Perron unit root test in order to evade the problem of spurious outcomes that arise due non-stationary data. Using bounds testing

technique to cointegration to approximate the long-run connection and short-run dynamic connection of the model. The findings of this study demonstrated a cointegration relationship between the stock market returns and the explanatory variables included in the model.

The regression result revealed that real interest rates, real rate of exchange, real money supply and real GDP influence stock market returns in the long-run. While the short-run model revealed that only inflation rate and real money supply positively influences stock market returns. The results however revealed that economic growth in a country is the most important determinant of the long-run stock market returns. The estimated coefficient of the error correction term in the short-run regression model was relatively low implying that the adjustment process towards equilibrium is slow, hence explaining the significance of lagged terms.

5.4 Policy Recommendations

The government should ensure that there is a stable macroeconomic environment which will ensure high economic growth rate. This will not only attract more investments in the economy, but will also ensure high returns to the investors in the stock market, this will spur further growth in different sectors of the economy. The government should also ensure that it improves the living standard of the people by providing important social amenities that will improve the potential of the people to invest and save in the stock market.

The regulator should ensure compliance with the policies and regulations by the market players to make sure there is success and productivity of the stock market. The managers of the economy should implement the macroeconomic variables regulations that are good for the development of the stock market as this study evidently show that changes in the inflation trigger movements in the stock market.

5.5 Limitations of the Study

This investigation relied on data which was acquired from the NSE, CBK and KNBS. It was mainly secondary data. This is the first limitation since secondary data may be subject to errors, being out of date, inaccurate and incomplete.

The other limitation was the cost. The cost of getting the raw data was so high. Also the cost of printing and binding the document was very expensive. Time was also limited for data collection, data analysis and for completing the project on time.

5.6 Suggestion for Further Research

The stock market can be very sensitive to the peace and stability of a country. A study that focuses on influence of political stability on stock market returns should be conducted at the NSE.

Behavioural factors can also be studied to determine if they have any impact on the stock market returns in a country. Governance and corruption indices can be used to determine the influence they have on the stock market returns. Further studies can be done in other countries in the East Africa region using different methodology, time period and annual data instead of quarterly data.

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APPENDICES

APPENDIX I: Research Data

YEAR	QUARTER	SI	INF	CPI	ER	IR	MS	RGDP
2000	Q1	2233.18	7.7	46.73	74.431	23.76	309403	243956
	Q2	2003.1	9	49	77.545	23.11	310355	230418
	Q3	2001.32	11.5	51.63	78.197	20.57	308604	244786
	Q4	1913.35	11.6	52.21	78.733	19.6	314686	257177
2001	Q1	1830.53	10.5	51.66	77.753	20.19	307017	248993
	Q2	1657.14	6.8	52.35	78.62	19.26	306683	244858
	Q3	1400.87	3.8	53.58	78.946	19.44	315485	260684
	Q4	1355.05	2.3	53.42	78.686	19.49	322923	265473
2002	Q1	1183.1	1.2	52.29	78.057	18.86	311222	259266
	Q2	1086.62	1.8	53.3	78.663	18.38	331633	245409
	Q3	1043.4	1.9	54.6	78.807	18.14	335873	254234
	Q4	1362.85	2.9	54.97	79.534	18.34	350733	266676
2003	Q1	1608.34	8	56.45	76.583	18.49	352748	257855
	Q2	1934.96	13.4	60.46	73.722	15.73	362596	246467
	Q3	2379.91	9	59.53	77.904	14.82	370335	270863
	Q4	2737.59	8.8	59.8	76.019	13.47	396968	280467
2004	Q1	2770.6	9.1	61.59	77.262	13.12	394789	275761
	Q2	2639.75	6	64.11	79.27	12.17	407303	258812
	Q3	2670.69	14.4	68.09	80.721	12.27	416956	279575
	Q4	2928.35	17.6	70.32	79.774	12.25	432568	295386
2005	Q1	3126.07	14.3	70.41	74.803	12.84	434914	281287
	Q2	3972.15	14.2	73.22	76.681	13.09	442402	277819
	Q3	3832.69	7.5	73.23	74.103	12.83	453770	303029
	Q4	3973.04	4.4	73.43	73.107	13.16	474490	312998
2006	Q1	4101.64	8.4	76.35	72.1	13.33	545783	298188
	Q2	4260.49	4.3	76.39	71.8	13.79	528507	295138
	Q3	4879.86	4.9	76.8	71.78	13.54	504457	327868
	Q4	5645.65	6.6	78.27	72.16	13.74	478763	328265
2007	Q1	5133.67	3.4	78.9	69.6	13.56	638440	319085
	Q2	5146.73	2.7	78.46	69.16	13.14	615595	319476
	Q3	5146.46	5.3	80.9	68.35	12.87	581440	348569
	Q4	5444.83	5.6	82.68	67.45	13.32	557650	349744
2008	Q1	4843.17	10.5	87.18	67.88	14.06	747127	323262
	Q2	5158.56	17.4	92.14	65.93	14.06	719543	317191
	Q3	4180.4	15.9	93.75	63.03	13.66	716890	357816
	Q4	3521.18	16.6	96.38	62.65	14.87	673720	349372
2009	Q1	2805.03	14.1	99.5	79.58	14.87	866800	341264

	Q2	3294.56	10.6	101.91	79.58	15.09	824550	330274
	Q3	3005.41	9.8	102.9	79.81	14.76	789807	359669
	Q4	3247.77	8	104.07	79.25	14.8	761007	361624
2010	Q1	4072.93	5.5	105.01	76.49	14.39	1261646	357141
	Q2	4339.28	3.7	105.65	76.98	14.19	1224547	347698
	Q3	4629.8	3.3	106.32	77.58	13.98	1160438	381732
	Q4	4432.6	3.8	108.07	78.94	13.87	1086504	379145
2011	Q1	3887.07	7	112.41	82.21	13.92	1505853	378359
	Q2	3968.12	13.2	119.56	86.33	13.91	1444592	361815
	Q3	3284.06	16.5	123.88	94.85	14.79	1355670	401661
	Q4	3205.02	19.2	128.81	91.52	20.04	1305511	397472
2012	Q1	3366.89	16.9	131.36	83.54	20.34	1723349	391187
	Q2	3703.94	11.8	133.63	84.76	20.3	1640561	373778
	Q3	3972.03	6.4	131.78	84.61	19.73	1564173	420410
	Q4	4133.02	3.5	133.35	85.71	18.15	1509222	453762
2013	Q1	4860.83	4.1	136.72	86.5	17.73	1924700	509696
	Q2	4598.16	4.4	139.46	84.98	16.97	1849167	501007
	Q3	4793.2	7	140.99	87.17	16.86	1815433	491555
	Q4	4926.67	7.4	143.25	86.15	16.99	1744233	468909
2014	Q1	4945.78	6.8	145.99	86.33	16.91	1779118	575094
	Q2	4885.04	7	149.27	87.43	16.36	1814700	553057
	Q3	5255.62	7.5	151.62	88.49	16.04	1850994	546722
	Q4	5112.65	6.2	152.09	90.04	15.99	1957492	557490
2015	Q1	5248.16	5.8	154.48	91.81	15.46	2234800	647939
	Q2	4906.07	7	159.71	97.01	16.06	2133400	652638
	Q3	4173.52	6.1	160.93	103.89	16.82	2556000	636819
	Q4	4040.75	7.4	163.27	102.08	18.3	2658200	656091
2016	Q1	8982.09	7.1	165.45	101.485	17.87	2662198	694487
	Q2	3640.61	5.4	168.27	101.145	18.18	2755924	756821
	Q3	3243.21	6.3	171.12	101.271	13.86	2761842	687921
	Q4	3186.21	6.5	173.89	102.132	13.66	2753528	684274

APPENDIX II: Log Data

YEAR	QUARTER	lnSI	Inf	CPI	ER	IR	lnMS	lnRGDP
2000	1	7.711182	7.7	46.73	74.431	23.76	12.6424	12.40474
	2	7.602451	9	49	77.545	23.11	12.64547	12.34765
	3	7.601562	11.5	51.63	78.197	20.57	12.63981	12.40814
	4	7.556611	11.6	52.21	78.733	19.6	12.65933	12.45752
2001	1	7.512361	10.5	51.66	77.753	20.19	12.63466	12.42518
	2	7.412849	6.8	52.35	78.62	19.26	12.63357	12.40843
	3	7.244849	3.8	53.58	78.946	19.44	12.66187	12.47106
	4	7.211594	2.3	53.42	78.686	19.49	12.68517	12.48927
2002	1	7.075893	1.2	52.29	78.057	18.86	12.64826	12.46561
	2	6.990827	1.8	53.3	78.663	18.38	12.71178	12.41068
	3	6.95024	1.9	54.6	78.807	18.14	12.72449	12.44601
	4	7.217333	2.9	54.97	79.534	18.34	12.76778	12.49379
2003	1	7.382958	8	56.45	76.583	18.49	12.77351	12.46015
	2	7.567842	13.4	60.46	73.722	15.73	12.80104	12.41498
	3	7.774818	9	59.53	77.904	14.82	12.82216	12.50937
	4	7.914833	8.8	59.8	76.019	13.47	12.89161	12.54421
2004	1	7.926819	9.1	61.59	77.262	13.12	12.88611	12.52729
	2	7.878439	6	64.11	79.27	12.17	12.91731	12.46386
	3	7.890092	14.4	68.09	80.721	12.27	12.94074	12.54103
	4	7.982194	17.6	70.32	79.774	12.25	12.97749	12.59604
2005	1	8.047532	14.3	70.41	74.803	12.84	12.9829	12.54713
	2	8.287063	14.2	73.22	76.681	13.09	12.99997	12.53473
	3	8.251322	7.5	73.23	74.103	12.83	13.02535	12.62158
	4	8.287287	4.4	73.43	73.107	13.16	13.07	12.65395
2006	1	8.319142	8.4	76.35	72.1	13.33	13.20998	12.60548
	2	8.357139	4.3	76.39	71.8	13.79	13.17781	12.5952
	3	8.492872	4.9	76.8	71.78	13.54	13.13124	12.70037
	4	8.638641	6.6	78.27	72.16	13.74	13.07896	12.70158
2007	1	8.543576	3.4	78.9	69.6	13.56	13.36678	12.67321
	2	8.546117	2.7	78.46	69.16	13.14	13.33034	12.67444
	3	8.546064	5.3	80.9	68.35	12.87	13.27326	12.76159
	4	8.602422	5.6	82.68	67.45	13.32	13.23149	12.76496
2008	1	8.485325	10.5	87.18	67.88	14.06	13.52399	12.68622
	2	8.548413	17.4	92.14	65.93	14.06	13.48637	12.66726
	3	8.338162	15.9	93.75	63.03	13.66	13.48268	12.78777
	4	8.166551	16.6	96.38	62.65	14.87	13.42057	12.76389
2009	1	7.93917	14.1	99.5	79.58	14.87	13.67256	12.74041
	2	8.100028	10.6	101.91	79.58	15.09	13.62259	12.70768
	3	8.008169	9.8	102.9	79.81	14.76	13.57954	12.79294

	4	8.085724	8	104.07	79.25	14.8	13.5424	12.79836
2010	1	8.312118	5.5	105.01	76.49	14.39	14.04793	12.78589
	2	8.375464	3.7	105.65	76.98	14.19	14.01808	12.75909
	3	8.440269	3.3	106.32	77.58	13.98	13.96431	12.85247
	4	8.396742	3.8	108.07	78.94	13.87	13.89848	12.84567
2011	1	8.265411	7	112.41	82.21	13.92	14.22487	12.8436
	2	8.286048	13.2	119.56	86.33	13.91	14.18334	12.79889
	3	8.096836	16.5	123.88	94.85	14.79	14.11981	12.90336
	4	8.072474	19.2	128.81	91.52	20.04	14.08211	12.89288
2012	1	8.121745	16.9	131.36	83.54	20.34	14.35978	12.87694
	2	8.217152	11.8	133.63	84.76	20.3	14.31055	12.83142
	3	8.287033	6.4	131.78	84.61	19.73	14.26287	12.94899
	4	8.326764	3.5	133.35	85.71	18.15	14.2271	13.02533
2013	1	8.488964	4.1	136.72	86.5	17.73	14.47028	13.14157
	2	8.433412	4.4	139.46	84.98	16.97	14.43025	13.12438
	3	8.474954	7	140.99	87.17	16.86	14.41183	13.10533
	4	8.502419	7.4	143.25	86.15	16.99	14.37183	13.05816
2014	1	8.50629	6.8	145.99	86.33	16.91	14.39163	13.26229
	2	8.493933	7	149.27	87.43	16.36	14.41143	13.22322
	3	8.567053	7.5	151.62	88.49	16.04	14.43123	13.2117
	4	8.539473	6.2	152.09	90.04	15.99	14.48717	13.2312
2015	1	8.565633	5.8	154.48	91.81	15.46	14.61966	13.38155
	2	8.498228	7	159.71	97.01	16.06	14.57323	13.38878
	3	8.336515	6.1	160.93	103.89	16.82	14.75395	13.36424
	4	8.304186	7.4	163.27	102.08	18.3	14.79316	13.39405
2016	1	9.102988	7.1	165.45	101.485	17.87	14.79466	13.45093
	2	8.199907	5.4	168.27	101.145	18.18	14.82926	13.53688
	3	8.084319	6.3	171.12	101.271	13.86	14.83141	13.44143
	4	8.066587	6.5	173.89	102.132	13.66	14.82839	13.43611