EFFECT OF MONETARY POLICY ON PERFORMANCE OF THE NAIROBI SECURITY EXCHANGE IN KENYA

BY

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DECLARATION

This Research Project is my original work and has not been presented in any other University.

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This Research project has been submitted for presentation with my approval as University Supervisor.

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First, I thank God for Grace to complete this Work. My sincere appreciation goes to supervisor Mr. Martin Odipo who supported and encouraged me to compile this work. I also thank my family members for the support they gave me in completing this project.

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God Bless you all.

DEDICATION

I dedicate this project to my late mum Mary Nakhumicha Khakasa who did everything to ensure that I excel in everything I do. God bless you Mayi.

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LIST OF ABBREVIATION AND ACRONYMS

ANOVA	Analyses of Variance
CBK	Central Bank of Kenya
DF	Dickey Fuller
ECM	Error Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
NSE	Nairobi Securities Exchange
OMO	Open Market Operations
PPP	Purchasing Power Parity Theory
SPSS	Statistical Package of Social Sciences
U.S.	United States
UK	United Kingdom
VAR	vector autoregressive
VECM	vector error correction method

ABSTRACT

Stock markets are mainly used as market for raising the capital required to run businesses. The stock market give an indication of the overall status of a market as reflected in the stocks traded on it. Monetary policy is well utilized can support aggregate demand, boost economic development of a nation and drive stock prices higher. Monetary policies influence the level of money circulation and other key economic activities. The current study sought to investigate how monetary policy affected performance of the Nairobi Security Exchange in Kenya. Performance of NSE was measured using NSE 20 share index. The indicators of monetary policy which formed independent variables of the study included Money Supply (Money supply as a % of GDP); Inflation (Consumer Price Index); Repurchase rate (REPO Rate) and 91 Days Treasury Bill Rate. The study looked at how these indicators affected performance of NSE. The researcher collected secondary data mainly from the Kenya National Bureau of Statistics KNBS, NSE reports and publications and past journals and researcher. The study used secondary data collected from 2006-2016. The collected data was analyzed using SPSS software by descriptive and inferential statistics. The study established that interest rate had a direct significant relationship with performance of NSE ($r=0.337$, $p=0.025<0.05$); money supply ($r=-0.194$, $P=0.204>0.05$) and Treasury bills rate ($r=0.283$, $p=0.063>0.05$) were inversely correlated with performance of NSE. The study concluded that there was a direct correlation between interest rate and performance of NSE, there was an inverse correlation between money supply, treasury bills rate with performance of NSE, inflation either positively or negatively affects performance of NSE based on the prevailing economic conditions. The study recommended that the top management team of all companies operating Kenya and especially those whose shares are listed on NSE should leverage on monetary policies to enhance their performance which shall affect NSE performance. The Capital Market Authority CMA should timely communicate changes in monetary policy to investors and shareholders at NSE and how their wealth shall be affected. The Central Bank of Kenya together with the National treasury should work hand in hand to ensuring sound monetary policies on macroeconomic indicators (inflation, interest rates, and money supply) and fiscal policies (government expenditure and taxation).

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stock markets are mainly used as market for raising the capital required to run businesses. It is the place where company shares are freely traded among investors to improve the liquidity of shares (Kenourgios, Asteriou & Samitas, 2013). Monetary policy is formulated by central Banks to control the amount of money in circulation. Monetary policies play an important role in the determination of a stable macro economy. According to Schumpeter (1934) a well-functioning financial system promotes economic growth by facilitating selection of productive investments that are likely to succeed in enhancing efficient allocation of scarce resources. Despite this assertion, there has been concern among finance theorist as to whether policy makers can influence the way stock markets participants' make decision regarding their investment by influencing returns on stocks.

This study was anchored on three theories: monetarist theory; efficient market hypothesis theory and the modern economic theory. The monetarist theory argues that excessive expansion of the money supply is inherently inflationary, and that monetary authorities should focus solely on maintaining price stability (Brunner & Meltzer, 1993). This theory therefore believes that in circumstances where inflation is too high, the money supply should be decreased to manage the level of inflation. With less money circulating, supply and demand principles will bring inflation back down to lower levels (Friedman, 1956). Efficient Market Hypothesis Theory measures the ability of a market to incorporate new

information in stock prices as and when it emerges. This theory postulates that a market is rational and provides correct pricing. This means that the prevailing prices at any one given moment is close to the fundamental values. This theory is relevant for this study because it helps explain how stock prices change in a given market as a result of arrival of new information. This theory helps explain the manner that stock prices adjust with different stances of monetary policies.

The Modern Economic Theory argues that business organizations are exposed to foreign exchange risks since the cash flows of these businesses are affected by fluctuation in interest rates (Zerbe, 2001). Firms are either directly or indirectly exposed to these fluctuations in exchange rate, interest rate fluctuations, inflation among other variables. Differences in these types of exposures (direct and indirect) arise whether a business is exposed to payables and receivables (Bakarr, 2014). This theory is relevant for this study because it helps explain the economics behind monetary policies on activities at the securities market. It explains the costs involved in conducting trade which in turn affects business at the stock market.

1.1.1 Monetary Policy

Monetary policy refers to any policy developed by the monetary committee of the Central Bank relating to the supply of money. The monetary policy has an impact on the activity levels registered by financial markets in an economy. Monetary policy encompasses various stabilization mechanisms formulated and implemented by central banks to achieve the desired level of monetary stances. It is meant to regulate the amount of money

in regulation, general level of prices of goods and services among other aspects of the economy. This is achieved through regulation of interest rates and open market operations (Gertler & Karadi, 2015). The effectiveness of monetary policies in achieving the desired stances varies from one economy to another making it difficult to make generalizations of what policies are suitable for economic growth (Bernanke, 2005).

Central banks use several tools to reach the desired monetary policy stances including interest rates for both short and long term. The policies could have either direct or indirect effects on various determinants of economic growth. Most monetary policy instruments have direct impact on the wider financial markets like the securities market, government bonds, consumer credit market, foreign currency purchase and sale market among others (Mishkin, 2000). Generally, economic behavior changes following the effects of monetary policies. Therefore, clear understanding of the monetary policy effects on capital markets is important in ensuring the capital markets function optimally (Ioannidis & Kontonikas, 2008).

1.1.2 Performance of a Stock Market

This is an indicator how the stock market has performed as a whole which can be used to predict the future potential to investors for the purposes of decision making. It basically gives an overall representation of changes in prices of stocks (Olweny & Kimani, 2011). The performance is measured by the level of volatility in stock prices which gives information on expected future trends of the market as a whole and in each segment (Paramati & Rakesh, 2011).

The stock market give an indication of the overall status of a market as reflected in the stocks traded on it. General increases in stock prices in a market signify existence of positive news to investors as regards the future status of their investment. Negative news will generate a decline in prices of shares which means that investors are pessimistic on the future status of their investment (Vygodina, 2006). The general performance of stock markets is measured using several proxies like the Share Index which gives a summary of the general market.

1.1.3 Monetary Policies and Stock Market Performance

Monetary policies influence the level of business activity in an economy, they influence the general behavior of households on investment, consumption and savings (Cassola & Morana, 2004). Monetary policies influence the general prices of goods and services, amount of money in circulation which is important in determining the level of activity on stock markets (Bernanke and Kuttner, 2005).

Stock prices which determine stock market volatility and returns may be influenced by variation in future earnings, discount rates of future dividends, risk preferences of investors and taxes. In establishing the relationship between monetary policies and security market performance, Bernanke and Kuttner (2005) notes that one needs to take into considerations the likelihood of policy actions in the monetary stances announced by central banks (Kuttner, 2001). For instance, any policies developed with the aim of tightening stances always exerts negative effects on the security market. These findings are further supported by Bredin et al. (2007) who find that unanticipated policy changes

have a significant impact on both aggregate and the majority of the sixteen sectoral stock returns that they employ.

According to the Efficient Market Hypothesis (EMH), the prices of securities fully reflect available information. Financial assets are continuously traded in liquid wholesale markets with low transaction costs, where prices reflect market perceptions almost instantaneously thus investors buying securities in an efficient market should expect to obtain an equilibrium rate of return. General EMH theory however insists that there ought to be an efficient market in which stock prices reflect all available information, and if there is no price perversion, stock prices are to reflect company's productivity such as economic fundamentals in macroeconomics.

1.1.4 Monetary Policy and Stock Market Performance in Kenya

The monetary policy circles were passive in the first ten years after independence as the level of economic growth was eight percent and the level of general increases in price of goods and services remained low at two percentage points. Monetary policy in the country was mainly perpetuated through setting credit ceilings between the 1960 to the year 1980. However, following economic liberalization in the 1990s' which saw the open market operations as the main tool of monetary policy. This saw the cost of credit increase similar to cost of capital.

Monetary policy is important to the level of activities in the securities market because of its ability to influence the level of wealth earned by investors in a securities market following the multiplier effects.

1.2 Research Problem

Monetary policy if well utilized can support aggregate demand, boost economic development of a nation and drive stock prices higher. Monetary policies influence the level of money circulation and other key economic activities.

Several studies have been conducted on monetary policies and performance of stock markets across the world. For instance, Hsing (2013) examined the likely impacts that Monetary and monetary policy changes had on the performance of stock markets in Poland using GARCH model using data collected for a period spanning 1999 to the year 2012. From the findings, no significance relationship was established between Monetary and monetary policies and stock market performance. Ali, Adeeb and Saeed (2014) focused on the effect of monetary policy on stock returns using empirical evidence drawn from manufacturing sectors of Pakistan for the period 2001 to 2010. Al Mukit and Shafiullah (2012) examined the reaction of post crashed stock market share prices against various monetary policy variables in Bangladesh through monthly data. The findings indicate that there was no predetermined effectiveness of monetary policy as this is subject to a number of variables including market conditions and business cycles. Ajisafe and Folorunso (2002) assessed how the monetary and monetary policies effectively facilitated the management of an economy. The findings indicated that both monetary and monetary policies posted negative relationship with balance of payment over a long period. These studies concentrated on international arena with different macroeconomic and policy setting from those in Kenya. Therefore it makes it difficult to apply their findings to the Kenyan scenario.

Locally, Maara (2017) studied how stock market performance was affected by both monetary and monetary policy in Kenya using the Structural Vector Error Correction model (VECM) on quarterly data. Mutuku (2014) examined monetary policy decisions related with changes in stock market returns at the NSE, Kenya. Machasio (2013) examined the reactions of stock market returns to changes in various monetary policy instruments in Kenya using evidence from firms quoted at the NSE. Muthama (2013) examined the reaction of stock market to changes in the monetary policy in Kenya using secondary data drawn from 2003 to 2013. Ngigi (2000) examined the interaction between monetary policy and stock market performance using empirical data from the NSE. These studies though undertaken in the Kenyan context, the scope and variables are different from the current study.

From the above review, the existing studies considered a different period from the Current study. This study therefore sought to fill the periodic gap in research by answering one research question: What are the effects of monetary policy on performance of the Nairobi Security Exchange in Kenya?

1.3 Research Objective

To determine the effect of monetary policy on performance of the Nairobi Security Exchange in Kenya.

1.4 Value of the Study

The findings of the study would be relevant to policy makers, future researchers and scholars, and government managers in different departments. For the policy makers

especially at the Ministry of Finance, the findings of this study would be relevant in providing key information that would influence their formulation and implementation of policies relating to monetary policy and stock market performance. They would consider several taxation policies and how they have affected stock market performance.

The findings of this study would also be relevant to future scholars and researchers in that it would act as a source of empirical literature for their future studies besides suggesting areas for further research. This would help grow and extend the application of the existing theories on how monetary policies relate with stock market performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on the effects of monetary policy on performance of the Security Exchange. It specifically looks at the theories, on which the study is founded, empirical literature as done by previous scholars and researchers so as to establish the research gaps.

2.2 Theoretical Review

This section covers various theories on which the study is founded. The theories are discussed in details below:

2.2.1 Monetarist Theory

This theory was formulated by Friedman in 1956 to help bring into focus the theory on demand for legal tender. Specifically, the theory considers the level of fluctuations in the actual amount of money in circulations and its effect on income for individuals (Palley, 2006). This theory holds the belief that it is not good for central banks to expand money supply excessively as this would lead to inherent inflationary effects (Friedman, 1976). Instead, Friedman argued that central banks need to concentrate their efforts in stabilizing the general price of goods and services (Brunner & Meltzer, 1993). The theory puts the burden of controlling aggregate spending in an economy to the government. This can be achieved through maintenance of low inflation and stable prices. However, it is important

that the Government checks regularly to ensure that the level of money supply does not fall or increase beyond acceptable proportions to maintain stability.

This theory therefore believes that in circumstances where general price of goods and services in an economy is too high, it is important that the level of money supply be reduced to maintain the prices stable (Friedman, 1956). Likewise, at times of limited amount of money in circulation, the Government can think of expanding the monetary base so as to avert negative effects of deflationary spiral. In either case, interest rates which represent the general cost of borrowing is used to either promote or discourage borrowing thereby maintain the desired level of aggregate demand (Friedman & Meiselman, 1963).

This theory is relevant for this study because it helps explain the core of monetary policies which is ensuring economic stability. It uses different instruments to ensure that the level of money supply and demand is matched so as to avoid unnecessary general increases of drops in prices.

2.2.2 Efficient Market Hypothesis Theory

This theory was advanced by Fama in 1971 and states that it is not easy for an individual to beat the market as existing prices always exhibit all available information. It is therefore thought that individual investors will make rational decisions that optimize their wealth at any one given moment (Fama, 1991). It measures the ability of a market to incorporate new information in stock prices as and when it emerges. This theory postulates that a market is rational and provides correct pricing on its own when demand

and supply interact. This means that the prevailing prices at any one given moment is close to the fundamental values. According to Fama (2000), market efficiency refers to a market that always has the prices of its shares of stocks reflecting all available information at any one given time. Three distinct information sets are always reflected: past prices, publicly available information and all the information including private information (Fama & French, 1995).).

The efficient market hypothesis is divided into three distinct forms as: weak, semi-strong and strong form. In a weak form market, prevailing stock prices reflect all historical information meaning that the price changes from one point in time to another are always independent (Fama, Fisher, Jensen & Roll, 1969). In a semi-strong market, stock prices reflect all historical and publicly available information. This includes key data on products of the organization, dividends, bonus announcements, stock splits, composition of the balance sheet, held patents and accounting practices among other data (Fama, 1991). This makes it difficult for an individual to make superior profits using the fundamental analysis of the market. In a strong form of efficient market state, stock prices reflect all available information including historical data, publicly available information and private information. In such a market, no investor can beat the market regardless of what they do (Fama *et al.,* 1969).

This theory is relevant for this study because it helps explain the how stock prices change in a given market as a result of arrival of new information. This theory helps explain the manner that stock prices adjust with different stances of monetary policies.

2.2.2 The Modern Economic Theory

This theory was developed by Keynes (1936) to help explain the role played by cost of doing business on the volume of business transacted. According to this theory, business organizations are exposed to foreign exchange risks since the cash flows of these businesses are affected by fluctuation in interest rates (Meyer, 2003). Firms are either directly or indirectly exposed to these fluctuations in exchange rate, interest rate fluctuations, inflation among other variables. Differences in these types of exposures (direct and indirect) arise whether a business is exposed to payables and receivables (Bakarr, 2014).

According to Shapiro (1975) and Levi (1994), the main sources of macroeconomic uncertainty influencing cash flow and returns of a firm. This theory supports the changes in the monetary policies as governments engage in trade (Hutson & Stevenson, 2010). This theory is relevant for this study because it helps explain the economics behind monetary policies on activities at the securities market. It explains the costs involved in conducting trade which in turn affects business at the stock market.

2.3 Determinants of Stock Market Performance

Stock market performances give signals to investors about the rates of the stock market entirely or a specific stock for them to consider their future moves. The shifts in the prices and indexes indicate the trend of stocks and the sector which in turn helps to show the economic rates. Major determinants of stock market include political, economic and company specific issues. For overall index performance, a country's income, it is crucial

to consider the GNP (Gross National Product) growth, PPP (Purchasing Power Parity), monetary issues, Interest rates, inflation, and Political Stability, International Relations, and Balance-of-Payment situation. In firms, specific stocks are considered where profitability, sales, profit margin, growth, are the main determinants of stock.

2.3.1 Monetary Policy

Several scholars have examined the role that monetary policy plays in stock market performance. Hsing (2013) findings indicate that no significance relationship was established between Monetary and monetary policies and stock market performance. Goh and McNown (2015) established that there was evidence short run effects of monetary policy on stock prices such that the nature of the policies determine the ultimate performance of asset markets in the long run. The study conducted in Kuala Lumpur, Malaysia noted inflation, exchange rates, interest rates and firm production as the main issues affecting the stock market over a long period of time. In another study, Misati et al (2010) established that different financial innovations developed led to a weakened monetary policy transmission stances in the Country following its reduced impact on the repurchase rates.

Chimobi and Igwe (2010) examined money supply and budget deficit in relation to inflationary pressures in Nigeria. The findings from the study indicated that budget deficit effected external deficits due to numerous factors. These findings were supported by Samimi and Jamshidbaygi (2011) who sought to establish how deficit budget affected inflation in Iran. The study money supply also affected the level of capital market performance which in turn influenced economic growth.

2.3.2 Interest Rates

Interest rates represent the cost that an individual pays for using another person's money. It is normally determined by the forces of demand and supply in the market. Interest rates have been found to have an impact on the cost of doing business because many deficient households get the money they need for investment from surplus households who are ready to be paid something on top of their balances in return for lending out. Empirical studies that have established the relationship between interest rates and share prices include: Ishfaq, Ramiz and Raoof (2010) as well as Gazi, Uddin and Mahmudul (2009).

Higher interest rates make investment alternatives for investors that more compelling compared to stocks. This means that the demand for shares will be lower in circumstances where interest rates are lower. Higher interest rates make borrowing less accessible as many people in the economy may have no means of repaying the principal amount together with interest (Gazi *et al.*, 2009). In times of higher interest rates, companies planning to borrow huge amounts pay more to do so which in turn hurts their returns on investment and hurt stock prices. For individuals, higher rates mean the more they will be required to spend more on servicing debt which makes the availability of capital to invest limited (Ling et al. 2008). The long-term influence of interest rate on stock prices is derived directly from time value of money which involves computation of current value of future returns.

2.3.3 Inflation

Inflation is a representation of general increase in consumer prices. In circumstances surrounded by general increases in price of goods and services, individual income is reduced as individuals will be required to spend more if they are to access the same amount of goods and services they have been accessing at the existing prices. This was well illustrated by Fama (1981) in their seminal work where it was established that there exists a negative correlation between inflation and anticipated activity in a stock market. It is argued that high inflation rates send signals of an economic downturn which prompts investors to start selling off their stocks (Galí, 2015).

According to Gambacorta, Hofmann and Peersman, (2014), there exists a two-way causation between share prices and the rate of inflation. Whenever inflation rises, the general price of commodities in an economy increases. Inflation has a bearing on the risk factor as it increases the amount of money required for individuals to maintain their current level of consumption. Therefore, the amount of savings which is later used in investments through purchase of stocks falls hence the fall in demand for shares and a drop in share prices (Gambacorta *et al.,* 2014).

2.4 Empirical Literature

A number of studies have been conducted on monetary policy and stock market performance across the world. This section discusses the empirical studies from a global to a local perspective.

2.4.1 Global Perspective

Monetary policy combines the measures enacted to control the cost and distribution of money in a local economy. It is therefore, the art of regulating the direction of credit facilities to generate stable prices and ultimately; growth in the economy. The Central Bank is responsible for the actions that control supply of money through instruments like the discount rates, moral suasion, direct control of interest rates, of the banking system credit, and open market operation (OMO). The monetary policy includes creation and execution of decisions to achieve stability by lowering inflation, protecting the value of currency, and consequently; growth of the economy.

Hsing (2013) examined the likely impacts that Monetary and monetary policy changes had on the performance of stock markets in Poland using GARCH model using data collected for a period spanning 1999 to the year 2012. The study was informed by the 2008 -2009 global financial crisis that caused severe recession in many countries. As a result, many countries witnessed a decline in output, overall stock prices and the overall level of employment. Statistics indicate that Poland stock market index declined 65.20%. This followed several monetary and monetary policies implemented with the aim of rescuing the economy. The study applied secondary data from published statistical bulletins. From the findings, no significance relationship was established between Monetary and monetary policies and stock market performance.

Goh and McNown (2015) examined the exchange rate regime–monetary policy autonomy nexus using evidence from Malaysia. They established evidence indicating that short run effects of monetary policy on stock prices such that the nature of the

policies determine the ultimate performance of asset markets in the long run. The study conducted in Kuala Lumpur, Malaysia noted inflation, exchange rates, interest rates and firm production as the main issues affecting the stock market over a long period of time.

In another study, Gowriah, Lamport and Seetah (2014) used evidence drawn from Island economy to study the relationship between monetary, monetary policies and performance of the shares on the stock exchange. The study looks at how a well nurtured stock market can promote economic development through attraction of foreign direct investment (FDI). The study applied multiple regression analysis and established that monetary policy had significant effect on stock prices.

Perera and Jayawickrema (2014) conducted a study on monetary policy rules in practice using data from Sri Lanka. The study showed a significant association between single variables and the stock market returns from which it revealed that, the changes in the interest rate structure trigger a delayed response from investors. The study further found out that many firms reported higher explanatory power of macroeconomic variables such as interest rate, exchange rate, money supply, inflation in explaining stock prices. They concluded that expected inflation are significantly positively related to stock returns in Sri Lanka and Sri Lankan stock returns have a significant positive association with cotemporaneous and lagged yield spreads.

Al Mukit and Shafiullah (2012) examined the reaction of post crashed stock market share prices against various monetary policy variables in Bangladesh through monthly data. The study underscores the key role played by capital and financial markets in economic

development of nations. The stock markets play a key role as an intermediary between firms and investors. The monetary policy variables used in this study included: money supply, interest rate and inflation rate. The findings indicate that there was no predetermined effectiveness of monetary policy as this is subject to a number of variables including market conditions and business cycles. For instance, in bearish market condition, the impact of monetary policies on stock returns is greater compared to bullish market condition.

Didia, Freeman, Assad and Yuan (2015) assessed how the monetary and monetary policies effectively facilitated the management of an economy. This study was done in Nigeria noting the importance of monetary and monetary policies in emerging economies in influencing economic development. The study applied autoregressive technique and the vector error correction method (VECM); the model convergence has been studied. The findings indicated that both monetary and monetary policies posted negative relationship with balance of payment over a long period.

2.4.2 Local Studies

Kosimbei *et al* (2012) studied the choice of an optimal monetary policy in Kenya which involved the choice between the use of interest rate and reserve money or combination of both as policy instruments using data for the period 1994 to 2000 and by employing an error correction model. Their finding indicated that the use of interest rate as a policy instruments resulted in minimal losses compared to reserve money instruments. A

combination of both instruments lead to minimal losses from equilibrium output as opposed to use of instruments independently.

Misati et al (2010) concentrated on the functions played by financial innovations in ensuring that monetary policies in Kenya through a single equation. The study mined data relating to the period 1996-2007. From the study results, it was established that different financial innovations developed led to a weakened monetary policy transmission stances in the Country following its reduced impact on the repurchase rates. However, changes in there parameters showed no significant effect on the performance of share prices and monetary policy. Stock market returns showed no response to changes in the cash research ratio requirement alteration, Treasury bill and Repo rate.

More explicitly in Kenya, Mwangi, Makau and Kosimbei (2014) analyzed the impact of fiscal and monetary policies on securities market performance in Kenya using the general to specific model specification and deduction. Values for the anticipated and unanticipated fiscal and monetary policies were obtained and used in the estimation of the securities market performance. Results showed that both anticipated monetary policy actions and unanticipated fiscal policies actions affect securities market performance negatively while unanticipated monetary policy has positive effect on securities market performance. Anticipated fiscal policy was found to have no effect on market performance.

Maara (2017) studied how stock market performance was affected by both monetary and monetary policy in Kenya using the Structural Vector Error Correction model (VECM)

on quarterly data. The monetary policy was proxied by money supply (M2). The findings indicated that interest rates and other monetary policy instruments affected the performance of stock prices and general returns at the NSE. Mutuku (2014) examined monetary policy decisions related with changes in stock market returns at the NSE, Kenya. The study focused on eleven year period spanning 2003 to 2013. Through application of the Ordinary Least Square method, the results indicated that money supply multiplier positively influenced stock returns at the NSE. The parameters applied for monetary policy included: cash reserve requirement, Repurchase rate and treasury bills rate.

Machasio (2013) examined the reactions of stock market returns to changes in various monetary policy instruments in Kenya using evidence from firms quoted at the NSE. The study applied data spanning a period of fourteen years between 1998 and 2012. The study was completed through a casual research design with the monetary policy parameters including: Money Supply (M1), Treasury bill rate, and inflation as proxied by consumer price index on the stock market returns.

Muthama (2013) examined the reaction of stock market to changes in the monetary policy in Kenya using secondary data drawn from 2003 to 2013. Study variables included open market operations, cash reserve requirements, repurchase rate (REPO) and money velocity which was used as monetary policy stance. From the findings, less than one quarter of variations in stock prices were attributed to changes in monetary policy while a greater proportion of variations were attributed to other variables beyond the scope of this study. However, money supply multiplier was found to indicate a positive significant

effect on the performance of the stock market. Other variables exhibited insignificant relationship.

Ngigi (2000) examined the interaction between monetary policy and stock market performance using empirical data from the NSE. It is noted that the stock market performs a key role of financial intermediation by efficiently allocating limited resources optimally into productive uses. The study was motivated by policy adjustments and changes in stock market behavior. The stock market provides an alternative to the traditional bank financed capital which comes with restrictions. The findings indicated that monetary policies had a great impact on the performance of stocks at the NSE.

2.5 Conceptual Framework

The study was founded on the following conceptual framework which identifies monetary policies and stock market performance variables. These are illustrated in the figure 2.1 below:

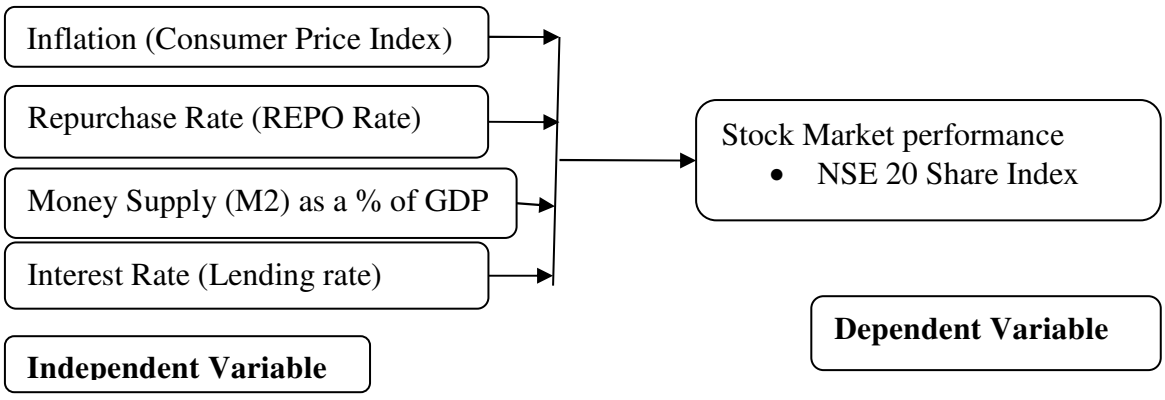

Figure 2.1: Conceptual Framework

2.6 Summary of the Literature Reviewed

The study has examined various empirical studies carried out by various scholars and researchers. However, Hsing (2013) examined the likely impacts that monetary and monetary policy changes had on the performance of stock markets in Poland using GARCH model using data collected for a period spanning 1999 to the year 2012. Hsing (2013) examined the likely impacts that Monetary and monetary policy changes had on the performance of stock markets in Poland using GARCH model using data collected for a period spanning 1999 to the year 2012. Ali, Adeeb and Saeed (2014) focused on the effect of monetary policy on stock returns using empirical evidence drawn from manufacturing sectors of Pakistan for the period 2001 to 2010. Gowriah, Lamport and Seetah (2014) used evidence drawn from Island economy to study the relationship between monetary, monetary policies and performance of the shares on the stock exchange. These studies were done on the international level and may not be applicable on the local context.

Al Mukit and Shafiullah (2012) examined the reaction of post crashed stock market share prices against various monetary policy variables in Bangladesh through monthly data. Ajisafe and Folorunso (2002) assessed how the monetary and monetary policies effectively facilitated the management of an economy. Maara (2017) studied how stock market performance was affected by both monetary and monetary policy in Kenya using the Structural Vector Error Correction model (VECM) on quarterly data. Machasio (2013) examined the reactions of stock market returns to changes in various monetary policy instruments in Kenya using evidence from firms quoted at the NSE. Muthama

(2013) examined the reaction of stock market to changes in the monetary policy in Kenya using secondary data drawn from 2003 to 2013. Ngigi (2000) examined the interaction between monetary policy and stock market performance using empirical data from the NSE. These studies concentrated on different variables and methodology from the current study. This study will therefore seek to determine the effect of monetary policy of stock market performance in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains research methodologies the research used to achieve objectives of the study. The chapter contains the research design, data collection instruments and data analysis.

3.2 Research Design

This study adopted a descriptive research design which is quantitative. Descriptive research design was selected upon because it sought to establish how monetary policy relate with stock market performance in Kenya Quantitative research designs helped researchers to estimate and measure relationship between the study variables.

3.3 Data Collection Methods

The researcher collected secondary data from the Central Bank of Kenya and Kenya National Bureau of Statistics. The researcher collected secondary data as the information is readily available. The study used annual data relating to eleven years from the year 2006-2016. The period was selected because it is has experienced differences in both study variables including monetary policies and performance of NSE.

3.4 Data Analysis Methods

The researcher collected data on the monetary policy and stock market performance for the period 2001-2016. Using this data, the researcher conducted a regression analysis to

establish the relationship between monetary policy and stock market performance in Kenya. The study applied the following regression model

$$\mathbf{Y= \beta 0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5 +Є}$$

Where Y= Stock market performance (NSE 20 Share Index)

X_1= Interest rate (Lending Rate)

X_2= Money Supply (Money supply as a % of GDP)

X_3= Inflation (Consumer Price Index)

X_4= Repurchase rate (REPO Rate)

X_5= 91 Days Treasury Bill Rate

β0= Constant

β1= Rate of Change in stock market as a result of a unit change in monetary policy component and other control variables.

The study used Analysis of Variance (ANOVA) to test the significance of the model in estimating the relationship between the dependent and independent variables. In addition, the study used the P-values to establish the significance of the variables in estimating the changes in the dependent variable.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

The researcher presents the findings of data analysis in this chapter. The researcher exclusively relied on secondary data collected using data collection sheet. The collected data was coded into SPSS software after which analysis was done. The analyzed data was presented using Tables.

4.2 Response Rate

The researcher sought to collect quarterly data on NSE 20 share index, Interest rate, money supply, GDP, Inflation, Repurchase Rate and 91 T-bill rates from 2001 to 2016 which represents 64 observations. However, the researcher was only able to obtain data from 2006-2016 which represented 44 observations. This represented a response rate of 69 %.

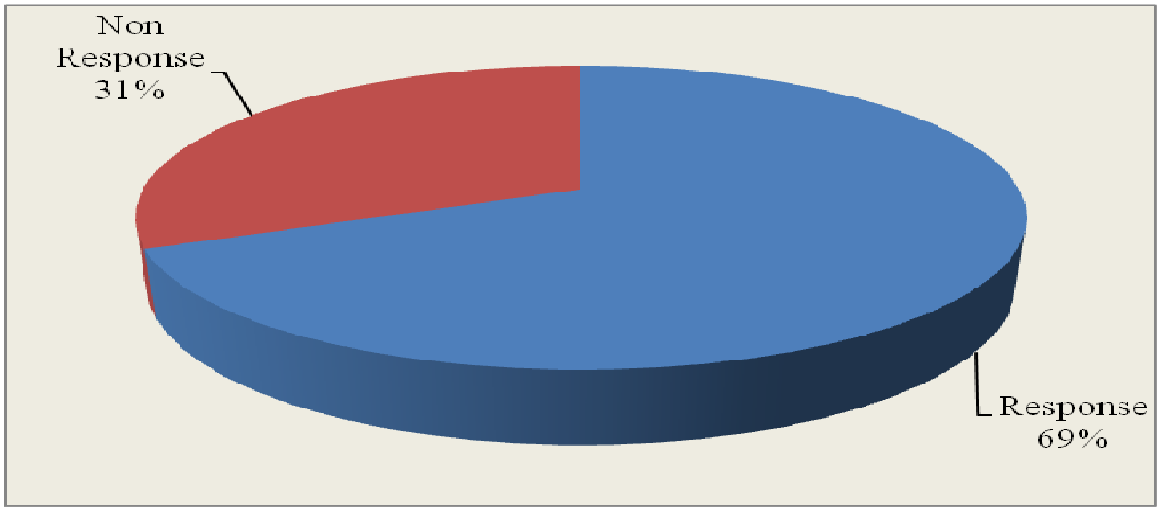

Figure 4.1: Response Rate

The response rate was in agreement with Babbie (2004) who indicated that return rates of above 50% are acceptable to analyse and publish, 60% is good and 70% is very good and above 80% is excellent. Therefore, the response rate was good for the study.

4.2 Descriptive Statistics

The researcher used means and standard deviations, Skewness and Kurtosis to describe effect of monetary policy on performance of the Nairobi Security Exchange in Kenya. The findings are indicated in Tables 4.1 and 4.2.

4.2.1 Means and Standard Deviations

The researcher used means and standard deviation to establish the effect of monetary policy on performance of the Nairobi Security Exchange in Kenya. The findings are indicated in Table 4.1.

Table 4.1: Means and Standard Deviations

	N	Minimum	Maximum	Mean	Std. Deviation
Interest Rate	44	2.04	18.30	9.2732	4.5370
Money Supply	44	.0003768	.000858	.0020	.00084
Inflation Rate	44	4.03	16.83	8.1375	3.7479
Repurchase Rate	44	1.36	16.68	6.3164	3.0299
91 Days T-bill Rate	44	1.82	19.35	8.2795	3.2054
NSE 20 Share Index	44	3.46	3.75	3.6251	.0804

From the study findings, interest rates had a minimum value of 2.04, maximum of 18.30, mean of 9.2732 and standard deviation of 4.5370. Money supply had a minimum of 0.0003768, maximum of 0.000858, mean of 0.00200 and standard deviation of 0.00084. Inflation rate had a minimum of 4.03, maximum of 16.83, mean of 8.1375 and standard deviation of 3.7479. Repurchase rate had a minimum value of 1.36, maximum of 16.68,

mean of 6.3164 and standard deviation of 3.0299. For 91 days T-bill rate, the minimum value was 1.82, maximum of 19.35, mean of 8.2795 and standard deviation of 3.2054. NSE share 20 index showed a minimum value of 3.46, maximum of 3.75, mean of 3.6251 and standard deviation of 0.0804. From the findings therefore, interest rates largely varied across the study period. This could be explained by changes in economic conditions.

4.4.3 Skewness and Kurtosis

The researcher further employed Skewness and Kurtosis in determination of normality assumptions of the data set. The findings are shown in Table 4.2.

Table 4.2: Skewness and Kurtosis

	N	Skewness		Kurtosis	
	Statistic	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
Interest Rate	44	.728	.357	-.306	.702
Money Supply	44	.631	.357	-.859	.702
Inflation Rate	44	1.157	.357	.104	.702
Repurchase Rate	44	.772	.357	2.062	.702
91 Days T-bill Rate	44	1.105	.357	3.405	.702
NSE 20 Share Index	44	-.422	.357	-.956	.702

From the findings, interest rates had Skewness of 0.728 with Kurtosis of -0.306. Money had 0.631 and -0.859, inflation rate had 1.157 and 0.104, repurchase rate had 0.772 and 2.062, 91 T-bill had 1.105 and 3.405 while NSE 20 share index had -0.422 and -0.956. This shows that the data set had normal distribution.

4.3 Correlation Analysis

In order to establish nature and direction of the study variables, the researcher carried out correlation analysis. The correlation Matrix Table below summarizes these findings.

Table 4.3: Correlation Analysis

		NSE 20 Share Index	Interest Rate	Money Supply	Inflation Rate	Repurchase Rate	T-bill Rate
NSE20 Share Index	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	44					
Interest Rate	Pearson Correlation	.337	1				
	Sig. (2-tailed)	.025					
	N	44	44				
Money Supply	Pearson Correlation	-.194	.301	1			
	Sig. (2-tailed)	.207	.047				
	N	44	44	44			
Inflation Rate	Pearson Correlation	.290	.980	.213	1		
	Sig. (2-tailed)	.056	.000	.164			
	N	44	44	44	44		
Repurchase Rate	Pearson Correlation	.043	.000	-.338	.020	1	
	Sig. (2-tailed)	.781	.998	.025	.895		
	N	44	44	44	44	44	
T-bill Rate	Pearson Correlation	-.283	-.327	-.383	-.298	.644	1
	Sig. (2-tailed)	.063	.030	.010	.049	.000	
	N	44	44	44	44	44	44

Correlation analysis was determined at 5% level of significance. Correlation analysis normally establishes the strength of the relationship between the study variables as weak, moderate or strong. In a weak correlation, r which is the Pearson Correlation Coefficient is between 0-0.29; for moderate relation, r lies between 0.3-0.49 while for strong relationship, r lies between 0.5 and 1. The value of Pearson correlation can be negative or positive based on the direction of the movement of the study variables.

From the correlation analysis above, only one variable; interest rate had a direct significant relationship with performance of NSE ($r=0.337$, $p=0.025<0.05$). Money

supply was inversely but insignificantly correlated with performance of NSE (r=-0.194, P=0.207>0.05). There was a direct but insignificant relationship between inflation and performance of NSE (r=0.290, p=0.056>0.05). Repo had a direct but insignificant relationship with performance of NSE (r=0.043, p=0.781). Treasury bills rate was inversely correlated with performance of NSE (r=0.283, p=0.063>0.05).

4.4 Regression Analysis

The researcher conducted regression analysis to determine effect of monetary policy on performance of the Nairobi Security Exchange in Kenya. The findings are indicated in subsequent sections.

Table 4.4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674[a]	.455	.383	.06315

The Model Summary indicates values for R and R square. R is the coefficient of correlation which measures the interrelationship between the study variables. R square is the coefficient of determination which indicates the strength which the independent variable affects the dependent variable of the study.

From the findings, the coefficient of correlation R is 0.674, showing that at least one of the independent variables of the study has a strong and positive relationship with the dependent variable. The coefficient of determination R square is 0.455 showing that 45.5% performance of the Nairobi Security Exchange in Kenya is explained by monetary policy. This opens out a debate and discussion on existence of other factors not included in the current study that affect performance of the Nairobi Security Exchange in Kenya by 54.5%.

Table 4.5: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	.126	5	.025	6.342	.000
Residual	.152	38	.004		
Total	**.278**	**43**			

An Analysis of Variance ANOVA was processed at 5% level of significance. From the processed data, F calculated is 6.342 while F critical at (d.f. 5, 38) is 2.463. As F calculated is greater than F critical, this shows that the overall regression model was a significant predictor of how monetary policy affects performance of the Nairobi Security Exchange in Kenya. The p value 0.000<0.05 shows that monetary policy has statistically significant influence on performance of the Nairobi Security Exchange in Kenya.

Table 4.6: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.773	.054		70.477	.000
Interest Rate	.042	.012	2.362	3.439	.001
Money Supply	-55.919	14.256	-.584	-3.923	.000
Inflation Rate	-.044	.014	-2.042	-3.064	.004
Repurchase Rate	.005	.004	.184	1.101	.278
91 Days T-bill Rate	-.012	.004	-.461	-2.647	.012

From the findings, the following equation is formulated:

$$\mathbf{Y= 3.773+0.042X_1-55.919X_2-0.044X_3 -0.012X_5}$$

Where Y= Stock market performance (NSE 20 Share Index)

X_1= Interest rate (Lending Rate)

X_2= Money Supply (Money supply as a % of GDP)

X_3= Inflation (Consumer Price Index)

X_5= 91 Days Treasury Bill Rate

This shows that when all monetary policies were held constant, performance of NSE would be at 3.773. A unit increase in interest rates would result into 0.0042 increases in performance of NSE. A unit decrease in money supply would result into 55.919 increases in performance of NSE. A unit decrease in inflation would lead to 0.044 increases in performance of NSE. A unit decrease in 91 T-bill rates would result into 0.012 increases in performance of NSE.

At 5%, interest rate ($p=0.001<0.05$), money supply ($p=0.000<0.05$), inflation ($p=0.004<0.05$) and T-bill rate ($p=0.012<0.05$) all had significant influence on performance of NSE. The above relationship that these variables had on performance of NSE was therefore statistically significant.

4.5 Discussion of the Findings

Correlation results showed that only interest rate had a direct significant relationship with performance of NSE ($r=0.337$, $p=0.025<0.05$). This showed that as interest rates (on lending) increases, financial institutions increase their customer deposits and loans which improves performance. According to (Gazi *et al.*, 2009), the higher the interest rate, the greater compelling the investment alternatives for investors in comparison to stocks and therefore share demand will drop during times of lower interest rates.

Money supply (r=-0.194, P=0.204>0.05) and Treasury bills rate (r=0.283, p=0.063>0.05) were inversely correlated with performance of NSE. However, this relationship was not significant based on correlation results. Similar findings were established in a study by Hsing (2013) where no significance relationship was established between Monetary and monetary policies and stock market performance. In a similar study by Misati et al (2010) it was established that monetary policies (cash research ratio requirement alteration, Treasury bill changes and changes in Repo rate) had no effect on stock market returns.

Correlation analysis further established that inflation (r=0.290, p=0.056>0.05) and Repo rates had a direct but insignificant relationship with performance of NSE (r=0.043, p=0.781). This findings contradicts with Goh and McNown (2015) who established evidence of short run effects of monetary policy on stock prices such that the nature of the policies determine the ultimate performance of asset markets in the long run. According to Al Mukit and Shafiullah (2012) there is no predetermined effectiveness of monetary policy.

Regression analysis revealed that interest rate (p=0.001<0.05), money supply (p=0.000<0.05), inflation (p=0.004<0.05) and T-bill rate (p=0.012<0.05) all had significant influence on performance of NSE. These findings contradict with correlation results where only interest rate was significant. According to Perera and Jayawickrema (2014) inflation positively and significantly affected stock returns in Sri Lanka. Similarly, Gowriah, Lamport and Seetah (2014) established that monetary policy had significant effect on stock prices.

Whereas correlation analysis indicated a direct relationship between inflation and performance, regression results established an inverse relationship. An inverse relationship between inflation and performance of NSE shows that as inflation reduces, performance of NSE is enhanced. A direct relationship on the other hand indicates that an increase in inflation brings about an increase in performance of NSE. The general truth is that an increase in inflation will increase the prices of goods and make accessibility to credit expensive. This reduces NSE performance. The inverse and direct relationship between inflation and performance of NSE based on correlation and regression results are best supported by a study of Didia, Freeman, Assad and Yuan (2015). According to the author, a combination of monetary policies had negative relationship with balance of payment over a long period.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The researcher uses this chapter to summarize the findings of the study, draw relevant conclusions and make sound recommendations. Additionally, the limitations encountered by the researcher in carrying out the study are clearly illustrated. The chapter also suggests areas that future scholars and academicians can explore to add more knowledge to the existing one.

5.2 Summary of the Findings

The main purpose of the study was to investigate how monetary policy affected performance of the Nairobi Security Exchange in Kenya. Performance of NSE was measured using NSE 20 share index. The indicators of monetary policy which formed independent variables of the study included Money Supply (Money supply as a % of GDP); Inflation (Consumer Price Index); Repurchase rate (REPO Rate) and 91 Days Treasury Bill Rate. The study looked at how these indicators affected performance of NSE. The researcher collected secondary data mainly from the Kenya National Bureau of Statistics KNBS, NSE reports and publications and past journals and researcher. The collected data was coded into SPSS software and the analysis was done using both descriptive and inferential statistics. A summary of the analyzed findings is clearly illustrated in this section.

Correlation analysis established that only interest rate had a direct significant relationship with performance of NSE ($r=0.337$, $p=0.025<0.05$). This showed that as interest rates (on lending) increases, financial institutions increase their customer deposits and loans which improves performance.

The findings of correlation analysis further showed that Money supply ($r=-0.194$, $P=0.204>0.05$) and Treasury bills rate ($r=0.283$, $p=0.063>0.05$) were inversely correlated with performance of NSE. However, this relationship was not significant based on correlation results. Correlation analysis also established that inflation ($r=0.290$, $p=0.056>0.05$) and Repo rates had a direct but insignificant relationship with performance of NSE ($r=0.043$, $p=0.781$).

From regression analysis, the coefficient of correlation R square was 0.674 showing that monetary policy had significant and far reaching effect on performance of NSE. The coefficient of determination R square was 0.455 indicating that monetary policy explains up to 45.5% change in performance of NSE. The overall regression model was significant as supported by F calculated (6.342) as compared to F critical (2.463). At 5%, regression analysis further indicated that interest rate ($p=0.001<0.05$), money supply ($p=0.000<0.05$), inflation ($p=0.004<0.05$) and T-bill rate ($p=0.012<0.05$) all had significant influence on performance of NSE. These findings contradict with correlation results where only interest rate was significant.

Whereas correlation analysis indicated a direct relationship between inflation and performance, regression results established an inverse relationship. An inverse

relationship between inflation and performance of NSE shows that as inflation reduces, performance of NSE is enhanced. A direct relationship on the other hand indicates that an increase in inflation brings about an increase in performance of NSE.

5.3 Conclusion

There was a direct correlation between interest rate and performance of NSE. This showed that as interest rates (on lending) increases, financial institutions increase their customer deposits and loans which improves performance. The interest rate in question however dependents on whether it refers to rate charged by financial institutions to loans on customers (lending) or the one customer receive on their deposits.

There was an inverse correlation between money supply, treasury bills rate with performance of NSE. The relationship between money supply, treasury bills rate with performance of NSE was statistically significant at 5% level of significance base on regression results. These are monetary policy tools that affect the costs of doing business by companies and firms and therefore affecting performance of NSE. The argument is founded on the Modern Economic Theory formulated by Keynes (1936).

Inflation either positively or negatively affects performance of NSE based on the prevailing economic conditions. A relatively lower level of inflation in an economy is called deflation and this is an economic bad since it may result into unemployment as the level of business activities are relatively lower and this reduces performance of NSE. A higher level of inflation in an economy may result into stagflation which is also not

desirable. This argument is supported by the Monetarist Theory formulated by Friedman (1956).

5.4 Recommendations

The top management team of all companies operating Kenya and especially those whose shares are listed on NSE should leverage on monetary policies to enhance their performance which shall affect NSE performance. During times when interest rates are low, firms should take up loans from banking institutions to expand their operations and improve on their liquidity which shall maximize the wealth of shareholders and therefore performance of NSE.

The Capital Market Authority CMA should timely communicate changes in monetary policy to investors and shareholders at NSE and how their wealth shall be affected. This calls for proper communication and regularly checking with the Kenya National Bureau of Statistics KNBS to get timely information. CMA should issue cautionary statements to shareholders immediately there is a signal of economic downtown.

The Central Bank of Kenya together with the National treasury should work hand in hand to ensuring sound monetary policies on macroeconomic indicators (inflation, interest rates, and money supply) and fiscal policies (government expenditure and taxation). Inflation and other indicators should be kept at sustained levels where they are neither too high nor too low to stimulate the economy.

5.5 Limitations of the Study

The researcher aimed to collect data for a relatively longer timeframe i.e. 2001 to date on a monthly basis. This was however not possible as the main source of collected data (KNBS) had only data starting from 2006. Moreover, it was not possible to collect GDP data on a monthly basis as most of the available data was on yearly and at least on quarterly basis. To overcome this, the researcher decided to use quarterly data from 2006 to 2016.

In collection of quarterly data, some variables like NSE 20 share index had data on a monthly basis. This meant that the researcher averaged the values to compute statistics for each quarter which was time consuming and required thorough accuracy. This has an implication that similar studies done with data on annual basis would offer different findings.

5.6 Suggestions for Further Studies

The researcher was interested in examining how monetary policy affected stock market performance; future scholars should analyze how fiscal policies also affect performance. NSE 20 share index was used as a measure of performance in the current study; future study should determine NSE performance through other measures like NSE 25 Index and

NSE All Share Index (NASI), for comparison of the findings. In the current study, there was no primary data and therefore future scholars should use both sources of data.

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APPENDICES

APPENDIX I: DATA FOR INTEREST RATES

Year	Quarter	Lending rates
2006	1	7.6
	2	6.6
	3	6.45
	4	5.73
2007	1	6.32
	2	6.53
	3	7.35
	4	6.87
2008	1	6.9
	2	7.73
	3	7.69
	4	8.59
2009	1	7.31
	2	7.33
	3	7.29
	4	6.82
2010	1	5.98
	2	2.98
	3	2.04
	4	2.28
2011	1	2.77
	2	8.95
	3	11.93
	4	18.3
2012	1	17.8
	2	10.09
	3	9.36
	4	9.25
2013	1	10.31
	2	5.11
	3	9.1
	4	9.4
2014	1	8.85
	2	11.4

	3	8.65
	4	8.57
2015	1	15.62
	2	15.57333
	3	16.08333
	4	17.34667
2016	1	17.92667
	2	18.14667
	3	16.54
	4	4.553333

APPENDIX II: DATA COLLECTION TEMPLATE FOR MONEY SUPPLY AS % OF GDP

Year	Quarter	Money Supply % of GDP
2006	1	0.001908416
	2	0.00203677
	3	0.001925074
	4	0.002004824
2007	1	0.002116734
	2	0.00220155
	3	0.002111211
	4	0.002203286
2008	1	0.002537926
	2	0.002645385
	3	0.002390323
	4	0.000857587
2009	1	0.002622169
	2	0.002807932
	3	0.002692184
	4	0.002900353
2010	1	0.003018166
	2	0.003321018
	3	0.0031707
	4	0.003323179
2011	1	0.003450453
	2	0.003746869
	3	0.003599885
	4	0.003768114
2012	1	0.001433352
	2	0.001448069
	3	0.001507876
	4	0.001536913
2013	1	0.00142735
	2	0.001382018
	3	0.001412744
	4	0.00149437
2014	1	0.001345877

	2	0.00131362
	3	0.001320391
	4	0.001416548
2015	1	0.001242202
	2	0.001193916
	3	0.001217895
	4	0.001341079
2016	1	0.001251461
	2	0.001078276
	3	0.001123707
	4	0.001310219

APPENDIX III: DATA COLLECTION TEMPLATE FOR INFLATION

Year	Quarter	Inflation
2006	1	6.15
	2	5.666667
	3	7.016667
	4	8.993333
2007	1	4.4
	2	4.58
	3	4.54
	4	5.54
2008	1	15.21667
	2	11.92333
	3	8.626667
	4	5.38
2009	1	10.3
	2	13.39333
	3	15.92
	4	16.83333
2010	1	4.033333
	2	4.706667
	3	5.866667
	4	7.85
2011	1	12.77667
	2	9.02
	3	6.013333
	4	4.156667
2012	1	10.69667
	2	14.29667
	3	16.29
	4	15.82667
2013	1	5.386667
	2	4.563333
	3	5.043333
	4	7.256667
2014	1	6.976667
	2	7.236667

	3	6.826667
	4	6.203333
2015	1	6.436667
	2	6.39
	3	6.656667
	4	6.666667
2016	1	6.853333
	2	6.6
	3	6.49
	4	6.423333

APPENDIX IV: DATA FOR REPO

Year	Quarter	Repo
2006	1	7.696667
	2	6.616667
	3	5.943333
	4	6.3
2007	1	6.626667
	2	6.98
	3	7.496667
	4	6.996667
2008	1	7.036667
	2	7.233333
	3	6.606667
	4	6.22
2009	1	4.933333
	2	4.746667
	3	3.696667
	4	3.553333
2010	1	3.046667
	2	2.426667
	3	1.8
	4	1.44
2011	1	1.356667
	2	5.316667
	3	6.083333
	4	12.21333
2012	1	10.55333
	2	16.68
	3	2.806667
	4	8.143333
2013	1	8.35
	2	8.343333
	3	4.863333
	4	2.65
2014	1	2.306667
	2	7.756667

	3	7.113333
	4	8.283333
2015	1	8.013333
	2	8.86
	3	11.20333
	4	6.91
2016	1	7.613333
	2	7.09
	3	5.666667
	4	2.35

APPENDIX V: DATA FOR 91 Day T-BILL

Year	Quarter	Tbill
2006	1	7.95
	2	6.876667
	3	6.1
	4	6.323333
2007	1	6.18
	2	6.65
	3	7.056667
	4	7.313333
2008	1	7.043333
	2	7.613333
	3	7.913333
	4	8.243333
2009	1	7.773333
	2	7.373333
	3	7.26
	4	7.1
2010	1	6.25
	2	4.12
	3	1.823333
	4	2.203333
2011	1	2.606667
	2	5.853333
	3	10.05
	4	16.41333
2012	1	19.35333
	2	12.42667
	3	10.21667
	4	9.026667
2013	1	8.78
	2	8.683333
	3	8.51
	4	9.726667
2014	1	9.133333
	2	9.143333

	3	8.816667
	4	8.63
2015	1	8.556667
	2	8.313333
	3	12.24
	4	14.6
2016	1	10.23667
	2	8.106667
	3	7.566667
	4	8.14

APPENDIX VI: DATA FOR NSE 20 SHARES INDEX AS % OF GDP

Year	Quarter	NSE 20 SHARE
2006	1	3.610579041
	2	3.621944661
	3	3.649017812
	4	3.730028281
2007	1	3.746610251
	2	3.710458768
	3	3.72331082
	4	3.712547532
2008	1	3.698202231
	2	3.71559216
	3	3.672385005
	4	3.548231266
2009	1	3.465857666
	2	3.463161331
	3	3.504764377
	4	3.49325779
2010	1	3.563420228
	2	3.626416338
	3	3.651162357
	4	3.656102494
2011	1	3.631781854
	2	3.603756813
	3	3.555520887
	4	3.514332681
2012	1	3.511187516
	2	3.556108396
	3	3.586249728
	4	3.611241222
2013	1	3.66266341
	2	3.68030529
	3	3.677576539
	4	3.697926445
2014	1	3.691228885
	2	3.690668524

	3	3.70759856
	4	3.712200586
2015	1	3.728326722
	2	3.692700074
	3	3.628525158
	4	3.599337133
2016	1	3.588309064
	2	3.584255819
	3	3.518996221
	4	3.508933526