

**EFFECT OF MONETARY POLICY INSTRUMENTS ON STOCK MARKET RETURNS  
AT NAIROBI SECURITIES EXCHANGE.**

**BY**

**IMMACULATE NAFULA MACHASIO**

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**DECLARATION**

I declare that this Research Project is my original work and has not been submitted for the award of degree in any other university.

Signed:.....

Date:.....

D63/75752/2012

This Research Project has been submitted with my approval as the University Supervisor.

Signed:.....

Date:.....

Supervisor: Dr. Josiah Aduda O.

Chairman, Department of Finance and Accounting

School of Business, University of Nairobi.

## **DEDICATION**

This Project is dedicated to my dear parents whose dreams have been to see me pursue studies to the height of intelligentsia club of the world. I have rolled up my sleeves and I will forever seek knowledge for a better and brighter future for all of us.

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## **ABSTRACT**

The purpose of this study was to investigate the effect of Monetary Policy Instruments on Stock Markets in Kenya specifically at The Nairobi Securities Exchange Market using annual data from 1998 to 2012. Causal Research Design was used to analyze data using Statistical Product and Service Solutions (SPSS). The software was run using three monetary policy variables including treasury bill rate, Money Supply(M1) and consumer price index (proxy for inflation) on the Stock Market Returns (proxied by NSE 20 share price index).

The general result of the analysis showed a strong correlation between monetary variables and Stock Market Returns. All the explanatory variables are positively related to Stock Market returns except treasury bill rate which has a negative relationship with stock market returns. Increase in CPI and Money Supply  $M_1$  causes a corresponding increase in Stock Market returns whereas an increase in Treasury Bill Rate causes a decrease in Stock Market Returns. The study has revealed that monetary policy has made significant influence over the prices of ordinary equities in Kenya and thus effectively on the returns. This implies that the equities market has significantly absorbed the monetary policy impulses and therefore the project confirms earlier studies done on the same topic regarding effect of Monetary policy on stock markets.

It would be important therefore to consider monetary variables as an important factor in determining stock market movements. Utmost care should be taken in designing monetary policies as it has a direct impact on cash inflows into the capital market and on the stability of the capital market and as such policy makers need to be aware of the need to encourage investors.

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## **LIST OF ABBREVIATIONS**

AD	Aggregate Demand
ANOVA	Analysis of Variance
CAPM	Capital Asset Pricing Mechanism
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
ECB	European Central Bank
EMH	Efficient Market Hypothesis
GDP	Gross Domestic Product
MPC	Monetary Policy Committee
NSE	Nairobi Securities Exchange
OMO	Open Market Operations
REPO	Repurchase Agreements
SPSS	Statistical Product and Service Solutions
VAR	Vector Auto Regression

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the study**

#### **1.1.1 Monetary Policy Instruments**

Monetary policy can be defined broadly as any policy relating to the supply of money. The Central Bank of Kenya has been trying to ease financial market by means of massive monetary policy interventions. Identifying the link between monetary policy and financial asset prices is highly important to gain a better insight in the transmission mechanism of monetary policy, since changes in asset prices play a key role in several channels (Amihud&Mendelson (1986). The Central Bank of Kenya's monetary committee defines monetary policy as the measures taken by the monetary authorities to influence the quantity of money with a view to achieving stable prices, full employment and economic growth. The ultimate objective of monetary policymakers is to promote the health of their economy by pursuing their mandated goals of price stability and maximum sustainable output and employment. Hence, monetary policy can also be defined in terms of formulation and execution of policies by the Central Bank, aimed at guiding bank lending rates to levels consistent with aggregate supply elasticity, all of which are set on the attainment of low inflation and high sustainable economic growth (Bernanke, 2003).

Monetary policy is a type of stabilization policy adopted by countries to deal with different economic imbalances. Monetary policy covers the monetary aspect of the general economic policy which requires that a high level of co-ordination between monetary policy and other

instruments of economic policy be maintained at all times (Akhtar, 2006). The effectiveness of monetary policy and its relative importance as a tool of economic stabilization varies from one economy to another, due to differences among economic structures, divergence in degrees of development in money and capital markets resulting in differing degree of economic progress, and differences in prevailing economic conditions (Bernanke, 2005).

The effects of the policy instruments such as the short-term interest rate, on the goal variables are indirect at best. Monetary policy actions have their most direct and immediate effects on the broader financial markets, including the stock market, government and corporate bond markets, mortgage markets, markets for consumer credit, foreign exchange markets, and many others (Mishkin, 2000). If all works out as planned, the changes in financial asset prices and returns induced by the actions of monetary policymakers lead to the changes in economic behaviour that the policy attempted to achieve. Thus, understanding how monetary policy affects the broader economy necessarily entails understanding both how policy actions affect key financial markets, as well as how changes in asset prices and returns in these markets in turn affect the behaviour of households, firms and other decision makers (Ioannidis and Kontonikas, 2006).

### **1.1.2 Stock Market Returns**

Stock market or stock exchange is an institution through which company shares and government stocks are traded. According to Anyanwu et al (1997), the stock exchange is a market where those who wish to buy or sell shares, stocks, government bonds, debentures, and other securities can do so only through its members (stock brokers). It is a capital market institution and is

essentially a secondary market in that only existing securities, as opposed to new issues, could be traded on. The impact of the stock market on the macroeconomy comes primarily through two channels. Firstly, as suggested by Greenspan (1996) is that movements in stock prices influence aggregate consumption through the wealth channel. Secondly, stock price movements also affect the cost of financing to businesses. A number of macroeconomic and financial variables that influence stock markets have been documented in the empirical literature without a consensus on their appropriateness as regressors. These works include Lanne (2002), Campbell and Yogo (2003), Jansen and Moreira (2004), Donaldson and Maddaloni (2002), Goyal (2004), and Ang and Maddaloni (2005). Frequently cited macroeconomic variables are GDP, price level, industrial production rate, interest rate, exchange rate, current account balance, unemployment rate, fiscal balance, etc.

De Long and Olney (2009) asserted that ever since stock markets came into existence in the world, economists have been saddled with the arduous task of making these financial intermediaries work efficiently and effectively. This is because stock prices are among the most closely watched asset prices in the economy and are viewed as being highly sensitive to economic conditions. The level of the stock market is a key variable which indicates the pulse of economic activity in a country and together with other variables such as the real Gross Domestic Product, the unemployment rate, the inflation rate, the interest rate and the exchange rate give a summary of the macroeconomy. Stock prices have also been known to swing rather widely, leading to concerns about possible "bubbles" or other deviations of stock prices from fundamental values that may have adverse implications for the economy.

Durban (2000) claimed that many financial crises in the past have been traced to a crash in the stock markets and one of the consequences of financial crises are decline in the level of the stock markets. In fact, stock markets are so important in any economy that the level of the stock markets is the key economic indicator which is heard about most often. Stock market indicators such as market capitalization, all-shares index, value and volume of stocks traded in the stock exchange are announced on the news daily. This shows the great importance of the stock markets to any economy in the world. Stock markets play a vital role in boosting long-run economic growth and as such governments the world over have instituted measures aimed at enhancing stock market operations. However, if any stock market is to play its allocative role properly, a lot more needs to be done on the macroeconomic policy framework front.

### **1.1.3 Monetary Policy Instruments and Stock Market Returns**

Most economists believe that monetary policy has a strong influence on the behaviour of households and firms. In the recent past considerable interest has been shown on the relationship between monetary policy and stock market returns in both developed and developing countries (Cassola and Morana, 2004, Bjornland and Lietemo, 2009 and Bernanke and Kuttner, 2005). Greatly motivated, in part, by the important role given to monetary policy in macroeconomic management in recent years. The other reasons include advances in econometrics techniques and availability of good quality data.

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. As Bernanke and Kuttner (2005) point out, when establishing the link between monetary policy

changes and stock returns one should account for the possibility that anticipated policy actions may have already been incorporated by market participants into their investment decisions. Bernanke and Kuttner (2005) use Kuttner's (2001) futures methodology to decompose the federal funds rate changes into expected and unexpected and find that an unanticipated monetary policy tightening exerts a negative impact on the US stock market. Bredin et al. (2007) adopt a similar empirical approach using UK data and 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.

It is worth-noting that, policy-induced changes in current and future real interest rates influence the timing of consumption and investment decisions of households and firms. On the other hand stock prices are assumed to be determined in a forward-looking manner, reflecting the future discounted sum of return on assets. This implies that stock prices may change in response to changes in expected future dividends, the expected future interest rate that serves as a discount rate or the stock return premium. From the aforementioned, monetary policy may influence stock prices directly through the interest rate channel and indirectly through its effect on the

determinants of dividends and the stock return premium by influencing the degree of uncertainty agents face (Ioannidis and Kontonikas, 2008).

From a fundamentalist point of view, making profits from stock trading depends on an investor's ability to accurately calculate stock's intrinsic value. This is done by examining the environment of the firm; related economic, financial and other qualitative and quantitative factors. Only then can the investor compare the stock's intrinsic value with its current market price and decide whether the stock is overpriced or underpriced. An overpriced stock would be the one that the intrinsic value is below the market price, while the converse is true for the underpriced stock. Rational investors would buy underpriced stock, with the hope that the stock market price will rise to its intrinsic value thus making a profit from the spread. Inversely, rational investors would sell over-priced stock because they would be expected to fall in price towards their intrinsic value. Specifically, monetary policies formulation should be geared towards enhancing the efficacy with which resources are mobilized through the stock market.

#### **1.1.4 Monetary Policy Instruments and Stock Market Returns in Kenya**

This study investigates the impact of monetary policy actions on stock market returns in Kenya. It seeks to answer the question on the nature and extent of the impact of monetary policy on the performance of the NSE in terms of stock market returns. The Central Bank of Kenya Act stipulates that “the principal object of the Bank shall be to formulate and implement monetary policy directed to achieving and maintaining stability in the general level of prices.” In addition, “the Bank shall foster the liquidity, solvency, and proper functioning of a stable market-based financial system.”

Main Instruments that CBK uses to implement monetary policy include the following:

**Open Market Operations (OMO)**-This is by far the main active monetary instrument most frequently used by the CBK to manage liquidity. The OMOs were conducted through sale and purchase of government securities using repurchase agreement (REPO) with commercial banks.

**Reserve Requirements**-Commercial banks are required to maintain a daily proportion of their liabilities in cash-currently 6%-at the CBK. This is not an actively used monetary policy instrument.

**Other Instruments include Rediscount Facilities and Lender of Last Resort Facility**, which have not been recently used as the key tools for implementing monetary policy.

In Kenya, dealing in stocks and shares started in the 1920s when the country was still under British colony. There was however no formal market, no rules and no regulations to govern stock brokerage activities. Trading took place on gentlemen's agreement in which standard commissions were charged with clients being obligated to honor their contractual agreements of making good delivery and settling relevant costs. In 1951 an Estate Agent by the name of Francis Drummond established the first professional stock broker firm and other stock brokerage firms were later established. The NSE came into being in 1954 when trading used to take place over a cup of tea at the New Stanley Hotel (Muga ,1974). The Nairobi Securities Exchange was constituted as a voluntary association of stock brokers registered under the societies Act in 1954 and in 1991 the Nairobi Securities Exchange was incorporated under the companies Act of Kenya as a company limited by guarantee and without a share capital. Subsequent development of the market has seen an increase in the number of stockbrokers, introduction of investment banks, establishment of custodial institutions and credit rating agencies and the number of listed companies have increased over time. Securities traded include, equities, bonds and preference shares.

## **1.2 Research Problem**

The question of whether shifts in monetary policy affect the stock markets has been widely examined in both academic and policy circles. In theory, there would be a significant response from stock markets in the short run since monetary policy exerts a significant impact on financial market conditions and stability by influencing asset prices and returns (Bernanke and Kuttner, 2005). All else being equal, the interventions by Central Banks (CBs) are said to be efficient in this case. Inversely, if the effect of monetary policy on stock market returns is insignificant, the changes that central banks would expect to see in the financial sector in order to achieve their macroeconomic objectives such as economic growth and inflation targets are unlikely to be made.

Hence, the investigation of the links between monetary policy and stock markets provides an effective means of understanding how monetary shocks are transmitted to the financial sector. The nature of the relationship between asset prices movements and monetary policy is currently a hotly debated topic in macroeconomics (Bernanke, 2002). It is of great interest, then, to understand more precisely how monetary policy and the stock markets are related. Monetary policy actions have their most direct and immediate effects on the broader financial markets, including the stock market, government and corporate bond markets, mortgage markets, markets for consumer credit, foreign exchange markets, and many others. Bernanke (2002) postulated that if all goes as planned, the changes in financial asset prices and returns induced by the actions of monetary policymakers lead to the changes in economic behaviour that the policy was trying to achieve. As Bernanke and Kuttner (2005) point out, some observers view the stock market as

an independent source of macroeconomic volatility to which policymakers may wish to respond. Monetary policy shifts significantly affect stock returns, thereby supporting the notion of monetary policy transmission via the stock market.

As Blinder (1998) notes, “Monetary policy has important macroeconomic effects only to the extent that it moves financial market prices that really matter—like long-term interest rates, stock market values, and exchange rates.” Economists such as Cassola and Morana (2004) have observed that monetary policy decisions generally exert an immediate and significant influence on stock index returns and volatilities in both European and US markets. Their findings also indicate that European Central Bank’s (ECB) press conferences following monetary policy decisions on the same day have defined impacts on European index return volatilities, implying that they convey important information to market participants. Many more assertions and ideas as to the relationship between monetary policy and stock markets abound in the literature and they shall be appropriately examined during the course of this work. However, there is no consensus opinion as to this topic as economists worldwide are still in debates about the issue. Therefore, this work wishes to address the issue of whether monetary policy affects stock market returns and how monetary policy shocks are transmitted to the stock market.

Previous researches done in the past on the transmission mechanism of monetary policy on stock markets have majorly focussed on the effects of changes in the interest rates on stock prices within a short period after the announcement of a change has been made and how interest rates affect the average prices of stocks and shares. This is evident in Bernanke and Kuttner (2005) and Hussain (2010). In addition, there has been little focus by researchers on effects of changes

in growth rate of money supply on stock markets and such works as Brunner, Friedman and Schwartz, Tobin (1978) are not recent. Furthermore, the previous works have focussed on average stock prices of companies quoted in the respective country's stock exchange. This project would therefore improve on existing knowledge by empirically analyzing the effects of growth rate of money supply, changes in interest rates and inflation rate on stock market returns which would be proxied by NSE 20 Share Index which measures both the prices and volumes of Blue Chip stocks traded in the stock exchange in Kenya.

Furthermore, most researches conducted in the past focus only on a particular region and such results are highly misleading. For example, research on Federal Reserve Bank's monetary policy and its effect on the performance of the Dow Jones index and the S and P 500; and effects of the European Central Bank's (ECB) policy and its effect on the stock markets of European countries are used to give policy advice to developing countries and stock markets. Jepkemei (2012) sought to investigate the impact of inflation on stock market liquidity. Monthly time series data was used and according to the findings, there exist an inverse relationship between rate of inflation and stock market performance. This study takes a closer look at the impact of monetary policy on stock market returns by utilizing ten years of data across companies listed at Nairobi Securities Exchange. The contribution of this study to the existing literature is two fold. First of all, previous research focuses primarily on the U.S. American stock market, while this study investigates African data specifically in reference to the Kenya. I am not aware of any study analyzing in depth the impact of monetary policy on stock market returns for Kenyan market. Thus, further investigation is of great interest, on the one hand because the results of the few existing studies are to a large extent ambiguous and, on the other hand, because the effect of

monetary policy on stock market returns might differ across countries, particularly when taking the differences in the statutes and policy aims. Secondly, while prior studies only consider effects of monetary policy on the aggregated market returns, I extend the analysis to the individual stock level. Previous work has been expanded on by examining the sensitivity of findings to the inclusion of stock market index in the stock returns calculation, while considering both nominal and real returns. To date few academic studies empirically examine the relationship between monetary policy and stock returns and this research is designed to fill the gap as we expand previous work.

### **1.3 Objective of the Study**

The main objective of the study is to investigate the effect of monetary policy Instruments on stock market returns in Kenya.

### **1.4 Significance of the Study**

Understanding the relationship between monetary policy instruments and Stock market returns would be beneficial to monetary authorities, investors, researchers and stock market participants. The monetary authorities will be able to design and implement appropriate policies as well as communicate the possible effects of policy on the stock market performance having shed light on stock market volatility. Investors will be able to accurately calculate the intrinsic value of stock, so as to ascertain whether the stocks are over/under valued at market price, thus helping them identify which stocks to sell/buy to make capital gains. Researchers will use the findings as a basis to explore other areas of research with regard to policy formulation and stock prices, indices and other ratios related to the stock market. Stock market participants will understand the

need of negotiating favorable deals with policy makers and voice out issues of concern and to understand policy shifts. The findings of this research will form a source of reference material for stock market participants and scholars with interest in capital markets and the results of the research will provide invaluable information to financial institutions in the country as well.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This section of the study surveys literature on the interaction between monetary policy and stock market returns. Both monetary and financial economists had been greatly intrigued by this area of study; with the monetary economists mostly concerned with whether money (monetary policy) has any bearing on stock prices and financial economists concerned with whether equity is a good hedge against inflation. The chapter seeks to outline the development of both the monetary policy and the stock market in Kenya. Firstly this chapter shall outline the advancement of the monetary policy as carried out by the CBK, and lastly discuss the evolution of the Nairobi Securities Exchange with regard to stock market returns.

### **2.2 Theoretical Review**

This research project was based on the following theories of monetary policy and stock markets.

#### **2.2.1 The Efficient Markets Hypothesis**

The Efficient Market Hypothesis (EMH) has been consented as one of the cornerstones of modern financial economics. Fama (1970) first defined the term "efficient market" in financial literature in 1965 as one in which security prices fully reflect all available information. The market is efficient if the reaction of market prices to new information should be instantaneous and unbiased. Efficient market hypothesis is the idea that information is quickly and efficiently incorporated into asset prices at any point in time, so that old information cannot be used to

foretell future price movements. Consequently, three versions of EMH are being distinguished depending on the level of available information.

The weak form EMH stipulates that current asset prices already reflect past price and volume information. The information contained in the past sequence of prices of a security is fully reflected in the current market price of that security. The semi strong form EMH states that all publicly available information is similarly already incorporated into asset prices. The strong form EMH stipulates that private information or insider information too, is quickly incorporated by market prices and therefore cannot be used to reap abnormal trading profits. Thus, all information, whether public or private, is fully reflected in a security's current market price. That means even the company's management (insiders) are not able to make gains from inside information they hold. The rationale behind this is that the market anticipates, in an unbiased manner, future development and therefore information has been incorporated and evaluated into market price in a much more objective and informative way than insiders.

### **2.2.2 Rational Expectations Theory**

The theory of rational expectations was formulated by Lucas in the early 1970s. The theory uses statistical methods to show that workers and businesses shape the economy by interpreting and updating information about the economy's future. As a result, government monetary policies can be anticipated, and this expectation may alter the predicted outcome of those policies. Lucas used the rational expectations theory to challenge many orthodox economic assumptions of the 1970s, particularly the theories of British economist John Maynard Keynes and the effectiveness of government intervention in the economy. In a typical rational expectations model, the public

adjusts its behaviour to announced monetary policy. The theory suggests that the current expectations in the economy are equivalent to what the future state of the economy will be. This contrasts the idea that government policy influences the decisions of people in the economy.

There are two main parts to rational expectations. First, Lucas began with the old assumption that recessions are self-correcting. Once people start hoarding money, it may take several quarters before everyone notices that a recession is occurring. That is because people recognize their own hardships first, but it may take a while to realize that the same thing is happening to everyone else. Once they do recognize a general recession, however, their confusion clears, and the market quickly takes steps to recover. Producers will cut their prices to attract business, and workers will cut their wage demands to attract work. As prices deflate, the purchasing power of money is strengthened, which has the same effect as increasing the money supply. Therefore, government should do nothing but wait the correction out. Second, government intervention can only range from ineffectualness to harm. Therefore, any government attempt to expand the money supply cannot happen before a businessman's decision to cut prices anyway. Keynesians are therefore robbed of the argument that perhaps the central bank might be useful in hastening a recovery, since Lucas showed that the central bank is not much faster than the market in discovering the problem.

### **2.2.3 Quantity Theory of Money**

This theory was described comprehensively by Irving Fisher (1911). It is the classical view of how money is used in the economy, and what variables it affects. The quantity theory of money is a theory of how the nominal value of aggregate income is determined. Because it also tells how

much money is held for a given amount of aggregate income, it is also a theory of the demand for money. The most important feature of this theory is that it suggests that interest rates have no effect on the demand for money. Fisher wanted to examine the link between the total quantity of money  $M$  (the money supply) and the total amount of spending on final goods and services produced in the economy  $PY$ , where  $P$  is the price level and  $Y$  is aggregate output (income). (Total spending  $PY$  is also thought of as aggregate nominal income for the economy or as nominal GDP.) The concept that provides the link between  $M$  and  $PY$  is called the velocity of money, the rate of turnover of money; that is, the average number of times per year that a unit of money is spent in buying the total amount of goods and services produced in the economy. Velocity  $V$  is defined more precisely as total spending  $PY$  divided by the quantity of money  $M$ .

The **equation of exchange**, which relates nominal income to the quantity of money and velocity is given as:  $MV = PY$ . The equation of exchange thus states that the quantity of money multiplied by the number of times that this money is spent in a given year must be equal to nominal income (the total nominal amount spent on goods and services in that year). Like other neoclassical economists, Fisher held the view that in the short run, monetary influence was dictated by interest rates that were sticky initially though rising subsequently while in the long run, the channel of influence was real cash balance. He argued that when wealth increases as a result of a rise in the stock of money, people try to reduce their cash balances by purchasing goods and services. Using the exchange equation of  $MV = PY$ , where velocity ( $V$ ) and output ( $Y$ ) are held constant, doubling money stock ( $M$ ) would lead to the doubling of the price level ( $P$ ). This means that when money stock increases following an increase in gold stock and rise in reserve, for example, in the short run, commodity prices will increase since it is assumed that

output and velocity were fixed initially. This implies that, the rate of inflation in the economy is entirely due to changes in the money supply.

#### **2.2.4 The Theory of Monetary Neutrality**

A basic proposition in monetary theory, called monetary neutrality, states that in the long run, a one-time percentage rise in the money supply is matched by the same one-time percentage rise in the price level, leaving unchanged the real money supply and all other economic variables such as interest rates. Money is said to be neutral if exogenous changes in the supply of money have no effect on real quantities and real prices. Monetary neutrality tells us that in the long run, the rise in the money supply would not lead to a change in the domestic interest rate. The fact that the increase in the money supply has left output and interest rates unchanged in the long run is referred to as long-run monetary neutrality. The only result of the increase in the money supply is a higher price level, which has increased proportionally to the increase in the money supply so that real money balances  $M/P$  are unchanged. If the Fisherian quantity theory is correct, then any change in  $M$  would lead to a corresponding change in  $P$ , while the real variables,  $Y$  and  $V$ , remain unchanged. This is known as the neutrality of money, a condition whereby changes to the money supply affect only nominal variables.

#### **2.3 Monetary Policy Instruments**

In the monetary policy process, variables play important roles, namely as instruments, goals, indicators and targets. The formulation of monetary policy by the monetary authorities requires appropriate variables on which it can focus as indicators of the need for such a policy (Handa, 2005). Such variables should provide information on the current and future state of the economy,

especially of goal variables, also known as policy guides. A monetary policy indicator, since it reflects the state of the economy, its value must also change if a policy changes that state so that the indicators are directly or indirectly functions of the policy instruments. The set of tools available to monetary authorities may differ from one country to another, according to differences in political systems, economic structures, statutory and institutional procedures, development of money and capital markets and other considerations. In most advanced capitalist countries, monetary authorities use one or more of the following key instruments: changes in the legal reserve ratio, changes in the discount rate or the official key bank rate, exchange rates and open market operations. In many instances, supplementary instruments are used, known as instruments of direct supervision or qualitative instruments. Although the developing countries use one or more of these instruments, taking into consideration the difference in their economic growth levels, the dissimilarity in the patterns of their production structures and the degree of their link with the outside world, many resort to the method of qualitative supervision, particularly those countries which face problems arising from the nature of their economic structures. Although the effectiveness of monetary policy does not necessarily depend on using a wide range of instruments, coordinated use of various instruments is essential to the application of a rational monetary policy. Open Market Operations (OMO) is where the CBK buys and sells Government securities in the money market in order to achieve a desired level of money in circulation. When the Central Bank sells securities, it reduces the supply of money and when it buys securities it increases the supply of money in the market (CBK, 2012).

### **2.3.1 Open Market Operations (OMO)**

Open market operations are the Central Bank's principal tool for implementing monetary policy, Sargent and Smith (1987). These purchases and sales of government Treasury and government agency securities largely determine the Central Bank rate (CBR) which is the interest rate at which depository institutions lend balances at the Central Bank rate to other depository institutions overnight. CBR in turn affects monetary and financial conditions, which ultimately influence employment, output, and the overall level of prices.

Central banks in most industrial countries conduct monetary policy mainly via open market operations, where money is supplied in exchange for securities discounted with a short run nominal interest rate, Wallace (1981). Hence, the costs of money acquisition depend on the current discount rate and the availability of collateral. In macroeconomic theory, however, it has often been claimed that open market operations are irrelevant in the sense that they are equivalent to lump-sum money transfers, Eggerston and Woodford (2003). The Central Bank buys or sells (on behalf of the Fiscal Authorities (the Treasury) securities to the banking and non-banking public (that is in the open market). One such security is Treasury Bills. When the Central Bank sells securities, it reduces the supply of reserves and when it buys (back) securities-by redeeming them-it increases the supply of reserves to the Deposit Money Banks, thus affecting the supply of money.

### **2.3.2 Repo Rate**

Repo rate is the interest rate at which the central bank sells and or repurchases government securities to or from commercial banks ([www.centralbank.go.ke](http://www.centralbank.go.ke)). In Repo transactions,

securities are exchanged for cash with an agreement to repurchase the securities at a future date. The securities serve as collateral for what is effectively a cash loan and, conversely, the cash serves as collateral for a securities loan. There are several types of transactions with essentially equivalent economic functions: standard repurchase agreements, sell/buy-backs and securities lending defined as repos. A key distinguishing feature of repos is that they can be used either to obtain funds or to obtain securities

(Brunetti, Filippo and Harris, 2009). This latter feature is valuable to market participants because it allows them to obtain the securities they need to meet other contractual obligations, such as to make delivery for a futures contract. In addition, repos can be used for leverage, to fund long positions in securities and to fund short positions for hedging interest rate risks (Ewerhart and Tapking, 2008). As repos are short-maturity collateralized instruments, repo markets have strong linkages with securities markets, derivatives markets and other short-term markets such as interbank and money markets which are important monetary policy tools. Repos are useful to central banks both as a monetary policy instrument and as a source of information on market expectations. Repos are attractive as a monetary policy instrument because they carry a low credit risk while serving as a flexible instrument for liquidity management. In addition, they can serve as an effective mechanism for signaling the stance of monetary policy (Hördahl and King, 2008). Repo markets can also provide central banks with information on very short-term interest rate expectations that is relatively accurate since the credit risk premium in repo rates is typically small. In this respect, they complement information on expectations over a longer horizon derived from securities with longer maturities (Eggerston and Woodford, 2003).

### **2.3.3 Interest Rates**

Modigliani and Cohn (1979) presented the money illusion effect in which markets tend to be depressed when nominal interest rates are high even though the real interest rate is not high. They argued that stock markets react inappropriately to inflation due to investors' ignorance that interest rate rise is to compensate for the rise in inflation. Howells and Keith (2000) argue in their book that, equity prices just like the price of all assets will respond to changes in interest rates. That is to mean, if the Central Bank raises the interest rates, for instance, the rate available on the risk-free assets goes up and if more can be earned on risk-free assets, then the holders of risky shares will want a higher return as well. The share prices will also fall if the equity market as a whole becomes more risk averse and demand a higher premium for any level of risk.

However, Bernanke and Kuttner (2003) concluded that very little of the market's reaction can be attributed to the effect of monetary policy on the real rates of interest. Robinson (1952) argued that the financial system does not spur economic growth and that, instead financial development simply responds to developments in the real sector. Thus, many influential economists give a very minor role, if any, to the role of financial system, particularly the stock market in economic growth. The interest rate that concerns the central bank as a monetary policy is the 3 months' short-term interest rate also called the Treasury bill rate which it influences through the sale of short term government securities and forms the basis for the setting of commercial bank lending rates.

### **2.3.4 Money Supply**

Money supply is the sum of currency outside banks and deposit liabilities of commercial banks, CBK (2012). Deposit liabilities are defined in narrower and broader senses as follows: narrow money (M1); broad money (M2); and extended broad money (M3). These aggregates are defined as follows:

$M1 = \text{Currency outside banking system} + \text{demand deposits}$

$M2 = M1 + \text{time and savings deposits} + \text{certificates of deposits} + \text{deposit}$

Liabilities of Non-Bank Financial Institutions (NBFIs)

$M3 = M2 + \text{residents' foreign currency deposits.}$

The CBK has been targeting monetary aggregate (broad money M3) in its policy decisions, Rotich et al. (2007) implying that at times of high inflation, or positive output, the CBK responded by reducing money supply.

### **2.3.5 Exchange Rates**

Basically stock exchange market serves as a channel through which surplus funds are moved from Lender-Savers to Borrower-Spenders who have shortages of funds (Mishkin 2000). Based on this premise, volatility in stock prices can significantly affect the performance of the financial sector as well as the entire economy. The financial position of an economy that is mainly determined by the capital market is susceptible to its foreign exchange volatility. Hence, this makes foreign exchange market developments to have cost implications for all the economic agents. Empirical evidence on the influence of foreign exchange market volatility on stock market is largely inconsistent. Mishra (2004) admitted that there is no theoretical consensus on the interaction between stock prices and exchange rate. For instance, Solnik (1987) is of the

opinion that there is a negative correlation between stock market and local currency. The set of instruments available to monetary authorities may differ from one country to another, according to differences in political systems, economic structures, statutory and institutional procedures, development of money and capital markets and other considerations. In most advanced capitalist countries, monetary authorities use one or more of the following key instruments: changes in the legal reserve ratio, changes in the discount rate or the official key bank rate, exchange rates and open market operations (Abaker, 2009).

In many instances, supplementary instruments are used, known as instruments of direct supervision or qualitative instruments. Although the developing countries use one or more of these instruments, taking into consideration the difference in their economic growth levels, the dissimilarity in the patterns of their production structures and the degree of their link with the outside world, many resort to the method of qualitative supervision, particularly those countries which face problems arising from the nature of their economic structures (Adam, 2009). Although the effectiveness of monetary policy does not necessarily depend on using a wide range of instruments, coordinated use of various instruments is essential to the application of a rational monetary policy. Some of the commonly used monetary policy tools include: Open Market Operations (OMO), Repo rate; Interest rates; Money supply; Exchange Rates; Balance of Payment (Handa, 2005).

## **2.4 Stock Market Returns**

Stock market or stock exchange is an institution through which company shares and government stocks are traded. According to Anyanwu et al (1997), the stock exchange is a market where

those who wish to buy or sell shares, stocks, government bonds, debentures, and other securities can do so only through its members (stock brokers). It is a capital market institution and is essentially a secondary market in that only existing securities, as opposed to new issues, could be traded on. The impact of the stock market on the macroeconomy comes primarily through two channels. The first, as suggested by Greenspan (1996) is that movements in stock prices influence aggregate consumption through the wealth channel. Second, stock price movements also affect the cost of financing to businesses. A number of macroeconomic and financial variables that influence stock markets have been documented in the empirical literature without a consensus on their appropriateness as regressors. These works include Lanne (2002), Campbell and Yogo (2003), Jansen and Moreira (2004), Donaldson and Maddaloni (2002), Goyal (2004), and Ang and Maddaloni (2005). Frequently cited macroeconomic variables are GDP, price level, industrial production rate, interest rate, exchange rate, current account balance, unemployment rate, fiscal balance, etc.

De Long and Olney (2009) asserted that ever since stock markets came into existence in the world, economists have been saddled with the arduous task of making these financial intermediaries work efficiently and effectively. This is because stock prices are among the most closely watched asset prices in the economy and are viewed as being highly sensitive to economic conditions. The level of the stock market is a key variable which indicates the pulse of economic activity in a country and together with other variables such as the real Gross Domestic Product, the unemployment rate, the inflation rate, the interest rate and the exchange rate give a summary of the macroeconomy. Stock prices have also been known to swing rather widely,

leading to concerns about possible "bubbles" or other deviations of stock prices from fundamental values that may have adverse implications for the economy.

Durban (2000) claimed that many financial crises in the past have been traced to a crash in the stock markets and one of the consequences of financial crises are decline in the level of the stock markets. In fact, stock markets are so important in any economy that the level of the stock markets is the key economic indicator which is heard about most often. Stock market indicators such as market capitalization, all-shares index, value and volume of stocks traded in the stock exchange are announced on the news daily. This shows the great importance of the stock markets to any economy in the world. Common stock markets in the world include S and P 500 in the United States, the FTSE 100 in the United Kingdom, the Nikkei Stock Average in Japan, the Hang Seng in Hong Kong, DAX in Germany, CAC 40 in France, Bovespa in Brazil to mention a few. In Kenya, we have our own Nairobi Securities Exchange , formerly Nairobi Stock Exchange. Eapen (2002) opined that stock market is the best indicator to forecast future economic activities and describe the actual causal effect between future economic growth and stock prices. Stock Market Returns at NSE is measured by the NSE 20 Share Index which takes into account 20 counters actively trading cutting across the various sectors e.g Agricultural, Automobiles & Accessories, Banking, Commercial and Services, Construction and Allied, Energy and Petroleum, Insurance, Investment, Manufacturing and Allied and Telecommunication & Technology. The NSE 20 Share Index is price weighted.

## **2.5 Empirical Review**

Thorbecke (1997) and Patelis (1997) found a positive correlation between expansionary monetary policy and real stock returns, where expansionary monetary policy is measured by a reduction in the funds rate or an increase in nonborrowed reserves. This conflict may be the result of the constant velocity of money under the Cash-in-Advance constraint. With Marshall's (1992) transaction cost justification for money, money velocity responds to a change in short-term interest rates. This response would create a positive correlation between real stock returns and the quantity of money.

Chami, Cosimano, and Fullenkamp (1999) opined that as a transmission mechanism, the stock market channel passes through the stock market rather than through the bond market. The role of equity markets in the transmission of monetary policy is established through the imposition of key conditions within any general equilibrium model of the economy with money. Their discussion suggests that a monetary transmission path leading through the stock market has strengthened in recent years. Thus, a monetary policy shock that leads to higher inflation prompts more stockholders to pressure firms to improve the performance of their stock. The managers of the firms respond to this pressure at least in part by changing the operations of the firm, and real economic activity changes.

Banerjee and Adhikary (2000) posited that the rationales for the relationship between the interest rate and stock market return are that stock prices and interest rates are negatively correlated. Higher interest rate ensuing from contractionary monetary policy usually negatively affects stock market return. This is because higher interest rate reduces the value of equity as stipulated by the

dividend discount model, makes fixed income securities more attractive as an alternative to holding stocks, may reduce the propensity of investors to borrow and invest in stocks, and raises the cost of doing business and hence affects profit margin. On the contrary, lower interest rates resulting from expansionary monetary policy boosts stock market.

Rigobon and Sack (2001) stated that the stock market endogenously responds to monetary policy decisions at the same time that policy is reacting to the stock market. Holding everything else equal, higher interest rates are associated with lower stock market prices, given the higher discount rate for the expected stream of dividends.

According to Bernanke (2003), understanding how monetary policy affects economic activity remains one of the greatest challenges of academic and financial sector economists. An important financial market that has been overlooked as a channel for a monetary transmission mechanism is the stock market. While most economists agree that stock returns are related to real economic activity, few have argued that stock returns play any role beyond serving as a measure of expected future corporate profits. However, many economists are of the opinion that stock market forms an important transmission path for monetary policy. Previous empirical evidence broadly supports the notion that restrictive (expansive) monetary policy decreases (increases) contemporaneous stock returns, as well as expected stock returns. They further state that both the short and long run generally suggest that monetary policy easing (tightening) produces higher (lower) stock market prices.

Hypothetically, the interest rate channel may lead to time variation in the response of stock returns if the elasticity of investment borrowing varies over time or if the intertemporal elasticity of substitution of consumption is cyclical. But, as Peersman and Smets (2005) argue, there is no clear economic reason for the effects of the interest rate channel to vary over the business cycle and no prediction regarding the direction of possible variation. Using forecasts of market participants compiled by Money Market Services (MMS) as a measure of the market expectations of the Fed funds target rate, Andersen et al. (2007) do not find a significant state dependence in the reaction of the stock market to monetary news. The credit channel of monetary transmission predicts that firms should react more to macroeconomic shocks in bad economic times for two reasons: First, due to a general reduction in the availability of credit as the bank lending channel predicts. Second, due to a further adverse effect on the balance sheets of the financially constrained firms. The disaggregated data on firm-specific credit characteristics and stock returns can be combined with the data on aggregate macro cycles to examine state dependence in the response of stock returns in the cross section of firms.

There is substantial empirical evidence that found an influence of money supply on stock returns. For instance, Fama (1981) and Jensen, Mercer and Johnson (1996) argue that increased nominal money supply leads to a portfolio rebalancing toward other real assets. This upward reallocation results in upward pressure on stock prices. Therefore, stock returns respond to unanticipated changes in nominal money supply. On the other hand, purely nominal increases in money supply may lead to great inflation uncertainty, and could have an adverse consequence on the stock market. Hence, money growth could be regarded as a leading indicator of future inflation, which in turn affects stock returns. Furthermore, increase in money supply leads to a falling in real

interest rates. Moreover, firms are faced with lower discount rates against future cash flows, and also respond to increasing income by adjusting their investments so as to generate greater sales and profits resulting in higher future cash flows and higher stock prices.

Basistha and Kurov (2008) found out that the coefficient estimates of the stock responses in bull market range from -31.96 to 28.85, with a mean of -0.83 and median of - 0.66. Less than 13% of these coefficient estimates are statistically significant at the 10% level or better. For bear markets, the range of the coefficient estimates is from -59.14 to 17.82, with a mean of -10.84 and median of -8.13. Over 62% of these estimates are statistically significant at the 10% level or better, including 21 positive coefficient estimates. 17 of the 21 firms that show significant positive responses to monetary news in bear markets are non-durable goods firms, utilities or energy firms. The distribution of bear market responses is skewed to the left. In bull markets, sensitivities to the term spread factor and sentiment have no statistically significant effect on the impact of target rate changes on stock returns. This finding is consistent with monetary shocks having little effect on stocks in good times. The OLS regression R squared is about 0.76, compared to only 0.03 for the bull market results. According to the theories of the credit channel of monetary transmission, firms that are relatively financially constrained should be most affected by monetary shocks in bad economic times because such shocks affect their access to credit.

In the Kenyan context, Ngigi (2000) obtained empirical results showing that both anticipated monetary policy actions and unanticipated fiscal policy actions affect the stock market negatively, whilst unanticipated monetary policy adjustments affect it positively. Anticipated fiscal policy actions on the other hand, were found to have no impact on the stock market.

Mutua (2010) suggested that the central bank of a country can also play an important role in the determination of stock prices (or market capitalization) through change in the money supply. A higher liquidity in the market creates higher demand for shares in the market, thus, increasing market capitalization.

## **2.6 Summary of Literature Review**

Monetary policy has implications to the stock market and to the economy. A restrictive monetary policy reduces the supply of funds for working capital and expansion of business. Alternatively a restrictive monetary policy may lead to increased interests rates and inflation rates thus increasing the cost of capital which makes it more expensive for individuals to finance home mortgage and purchase of durable goods (Mendelson 1976). Availability of other investments other than shares traded on the stock market affect the Stock market performance. Stock markets compete for investments with other assets in an economy such as corporate bonds, governments bonds, treasury bills, real estate and foreign equity among others. The influx of government bonds and treasury bills in Kenya, resulted into-the bull-run at the Exchange between 2004 and 2006 . This work wishes to address the issue of whether monetary policy affects stock market performance in terms of returns in the Kenyan Stock Market.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter explains in detail the methodology used to explain the relationship between monetary policy instruments and stock market returns. Section 3.2 details out the research design while 3.3 gives an overview of the population. Data collection and data analysis are contained in chapter 3.5 and 3.6 respectively.

### **3.2 Research Design**

Causal research design was used here. Mugenda&Mugenda (2003) explains that causal research explores relationship between variables i.e the effect of one variable on another. Since the study explores the relationship between monetary policy and stock market returns, the dependent variable is stock market returns while the independent variable is Monetary Policy instruments. This brings out cause-effect relationship.

### **3.3 Population.**

Since Stock market Returns is encompassed in computation of the NSE 20 Share Index, data was obtained from 20 companies listed at the Nairobi Securities Exchange which is the stock market in Kenya for a period of 15 years. Currently there are 61 companies listed on the Securities Exchang across diverse sectors. Data will be obtained from NSE Daily Market Reports available on the NSE website. The NSE 20 Share index data is readily available and takes into consideration highly capitalized and highly liquid counters. The constituent companies are always reviewed after every three months.

### 3.4 Data Collection

The study used secondary data from the NSE. Data was obtained from the NSE and covered the period between January 1998 and December 2012. The time of each purported change of monetary policy stance at CBK has also been put under consideration. The study focused on NSE performance as measured using the NSE 20 Share Index on a monthly basis for the study period.

### 3.3 Data Analysis

The main data variable for this study is the NSE 20 Share Index. The Index is used to measure the performance of the NSE from each trading day in terms of Stock Market Returns of 20 listed companies. The percentage increase or decrease in the NSE 20 Share index during various regimes is well noted. The Study used regression analysis to determine the relationship between variables of study. Studies by Ngigi(2000) and Basistha and Kurov(2008) have used regression analysis while researching on relationship among variables. The contemporaneous relationship between monetary conditions and stock returns is examined using the following regression model:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \epsilon$$

Where Y is a measure of Stock Market Returns as depicted by the NSE 20 Share Index, a is a constant term,  $x_1, x_2, x_3$  represent interest rates, inflation and Money Supply(M1) respectively while  $\epsilon$  is the error term. In this case, a data analysis tool SPSS package was our main tool of analysis and  $R^2$  and t-test statistics will be computed to measure the strength and significance of

relationship between variables and as such compare significance of differences for the comparative study periods. The study was tested at 95% confidence level and 5% significance value. Moyer et al. (1987:152) noted that in practice, the periodic return of security j can be computed using linear equation as follows.

$$R_j = a_j + b_j R_m + e_j$$

Where  $R_j$  is the periodic return for security j,

$a_j$  is a constant term determined by the regression,

$b_j$  is the computed historical beta for security j,

$R_m$  is the periodic return for the market index,

and  $e_j$  is a random error term.

## CHAPTER FOUR: DATA ANALYSIS & PRESENTATION OF FINDINGS

### 4.1 Introduction

The data for this study is time series data. The study applied annual-rate-of change analysis to find out the rate of change of the variables for the relevant years.

For Example; data 2011 =  $(2011-2010)/2010$  etc. This was done in order to improve on the data quality in order to reduce the incidence of spurious regressions and also make the test result more meaningful for acceptance. Multiple regressions analytical methods were adopted for the analysis on the converted data. These variables are denoted as X and Y variables. The rate of change in share prices captured in the share index is the dependent variable, while the rates of change in monetary policy variables are the independent variables i.e. Money Supply(M1), the Treasury bill rates, and Inflation proxied by consumer price index (CPI).

Table 1 stipulates various figures and values as obtained from secondary data. The NSE 20 Share index data is derived from the average monthly price indices over the period running from 1998 to 2012. CPI(%) is the proxy for inflation as obtained from KNBS Website. T/Bill rate(%) is the proxy for Interest rates while Money supply values are centred around M1 since this data is readily available from World Trade Economics Statistical Bulletin.

## 4.2 Data Presentation

### 4.2.1 Time Series Data

**TABLE 1: Time Series Data**

YEAR	NSE 20 SHARE INDEX	CPI(%)	T/BILL RATE(%)	MONEY SUPPLY(M1) in US MILLION DOLLARS
1998	2738.26	6.60	23.32	1380.64
1999	2520.00	5.80	13.29	1410.15
2000	2913.35	10.00	12.07	1529.97
2001	2355.05	5.80	12.73	1654.31
2002	2362.85	2.00	8.94	1947.56
2003	2079.82	9.80	3.73	2546.07
2004	2826.72	11.80	2.96	2722.86
2005	3648.20	9.90	8.44	3194.23
2006	4597.65	6.00	6.81	4204.66
2007	5262.65	4.30	6.80	5956.28
2008	4522.71	15.10	7.70	5054.34
2009	3027.31	10.50	7.38	5834.00
2010	4257.69	4.10	3.60	7147.89
2011	3751.92	14.00	8.73	7320.39
2012	3735.86	9.40	12.76	7510.65

Source: Kenya National Bureau of Statistics, Central Bank of Kenya Website, Nairobi Securities Exchange and World Trade Economics Statistical Bulletin.

**Table2:** Change in Annual Figures of Variables.

Year	Share Index	Change	CPI	CPI Change	T/Bill rate	Money Supply(M1)	M1 Change
1998	2738.26		6.60		23.32	1380.64	
1999	2520.00	<b>-218.26</b>	5.80	<b>-0.80</b>	13.29	1410.15	<b>29.51</b>
2000	2913.35	<b>393.35</b>	10.00	<b>4.20</b>	12.07	1529.97	<b>119.82</b>
2001	2355.05	<b>-558.3</b>	5.80	<b>-4.20</b>	12.73	1654.31	<b>124.34</b>
2002	2362.85	<b>7.80</b>	2.00	<b>-3.80</b>	8.94	1947.56	<b>293.25</b>
2003	2079.82	<b>-283.03</b>	9.80	<b>7.80</b>	3.73	2546.07	<b>598.51</b>
2004	2826.72	<b>746.90</b>	11.80	<b>2.00</b>	2.96	2722.86	<b>176.79</b>
2005	3648.20	<b>821.48</b>	9.90	<b>-1.90</b>	8.44	3194.23	<b>471.37</b>
2006	4597.65	<b>949.45</b>	6.00	<b>-3.90</b>	6.81	4204.66	<b>1010.43</b>
2007	5262.65	<b>665.00</b>	4.30	<b>-1.70</b>	6.80	5956.28	<b>1751.62</b>
2008	4522.71	<b>-739.94</b>	15.10	<b>10.80</b>	7.70	5054.34	<b>-901.94</b>
2009	3027.31	<b>-1495.40</b>	10.50	<b>-4.60</b>	7.38	5834.00	<b>779.66</b>
2010	4257.69	<b>1230.38</b>	4.10	<b>-6.40</b>	3.60	7147.89	<b>1313.89</b>
2011	3751.92	<b>-505.77</b>	14.00	<b>9.90</b>	8.73	7320.39	<b>172.5</b>
2012	3735.86	<b>-16.06</b>	9.40	<b>-4.60</b>	12.76	7510.65	<b>190.26</b>

Source: Derived from Table 1 above.

Table 2 shows the change in variables over the years. The change values computed facilitate calculation of Annual rate of change in order to obtain standard values for SPSS data input and analysis.

**Table 3:** The Converted Data (i.e) Using Rate of Change in Annual Figures of Variables.

Year	Share Index	Annual rate of change	CPI	Annual rate of change	T/bill	M1	Annual rate of change
1998	2738.26		6.60		23.32	1380.64	
1999	2520.00	<b>-0.0797</b>	5.80	<b>-0.1212</b>	13.29	1410.15	<b>0.0214</b>
2000	2913.35	<b>0.1561</b>	10.00	<b>0.7241</b>	12.07	1529.97	<b>0.0850</b>
2001	2355.05	<b>-0.1916</b>	5.80	<b>-0.4200</b>	12.73	1654.31	<b>0.0813</b>
2002	2362.85	<b>0.0033</b>	2.00	<b>-0.6552</b>	8.94	1947.56	<b>0.1773</b>
2003	2079.82	<b>-0.1198</b>	9.80	<b>3.9000</b>	3.73	2546.07	<b>0.3073</b>
2004	2826.72	<b>0.3591</b>	11.80	<b>0.2041</b>	2.96	2722.86	<b>0.0694</b>
2005	3648.20	<b>0.2906</b>	9.90	<b>0.1610</b>	8.44	3194.23	<b>0.1731</b>
2006	4597.65	<b>0.2603</b>	6.00	<b>-0.9934</b>	6.81	4204.66	<b>0.3163</b>
2007	5262.65	<b>0.1446</b>	4.30	<b>-0.2833</b>	6.80	5956.28	<b>0.4166</b>
2008	4522.71	<b>-0.1406</b>	15.10	<b>2.5116</b>	7.70	5054.34	<b>-0.1514</b>
2009	3027.31	<b>-0.3306</b>	10.50	<b>-0.3046</b>	7.38	5834.00	<b>0.1543</b>
2010	4257.69	<b>0.4064</b>	4.10	<b>-0.6095</b>	3.60	7147.89	<b>0.2252</b>
2011	3751.92	<b>-0.1188</b>	14.00	<b>2.4146</b>	8.73	7320.39	<b>0.0241</b>
2012	3735.86	<b>-0.0043</b>	9.40	<b>-0.3286</b>	12.76	7510.65	<b>0.0260</b>

Source: Derived from Table 2.

Table 3 shows the converted data using Rate of Change in Annual Figures of variables. This is computed by using the formula  $(V_{x+1}-V_x)/V_x$  e.g Value for 2011= $(2011-2010)/2010$ .

## 4.2.2 Regression Results

### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.821(a)	.674	.651	.61980

a Predictors: (Constant), MONEYM1, INTRATE, CPI

According to this Model Summary, the co-efficient of determination  $R^2$  depicts that 65.1% of variation in stock returns in the model can be explained by independent variables M1, T/bill & CPI.

The three independent variables that were studied, explain only 65.1% of the changes in the Stock Market returns as represented by the adjusted  $R^2$ . It can therefore be concluded that there are other factors not studied in this research which contributes 34.9% of the changes in Stock Market Returns in Kenya. This therefore, may form a basis for further research to investigate these factors affecting (34.9%) of the changes in the prevailing Stock Market Returns in Kenya.

### Variables Entered/Removed(b)

Model	Variables Entered	Variables Removed	Method
1	MONEY M1, INTRATE, CPI(a)	.	Enter

a All requested variables entered.

b Dependent Variable: NSEINDEX

The table above shows that all variables under consideration have been factored in and entered accordingly. No variables have been removed.

**Coefficients (a)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	134.47	0.709		18.973	0.001
	CPI	0.396	0.087	0.866	4.542	.008
	INTRA TE	-0.285	0.087	-0.405	-3.266	.002
	MONE YM1	0.022	0.089	.057	0.251	.803

a Dependent Variable: NSEINDEX

According to the tables showing Analysis of Variance and Coefficients, it can be deduced that CPI accounts for a high margin in stock market returns as compared to other monetary variables gauging from the coefficient beta of 0.971. Positive correlation is noted in CPI & Money Supply (M1) while T/Bill rate has a negative relationship with stock Market Returns.

In order to determine the effect of monetary policy on stock market returns, the multiple regression analysis equation generated as per the SPSS output table becomes:

$$Y=134.470+0.396X_1+-0.285X_2+0.022X_3+\epsilon$$

Where: Y is the stock market returns, X<sub>1</sub> is the CPI, X<sub>2</sub> is treasury bill rate as a proxy for interest rate and X<sub>3</sub> is Money Supply (M1) while  $\epsilon$  is the random error term.

As per the regression equation established, if all the three factors were taken into consideration (CPI, INTR & M<sub>1</sub>) to be constant at zero, stock market returns would be 134.470

basis points. The data findings analyzed also shows that if all other independent variables are taken at zero, a unit increase in CPI would lead to 0.396 increase in Stock Market Returns in Kenya. Further, a unit increase in T/bill rates in the form of interest rates will lead to an increase of -0.285 in stock returns whereas a unit increase in money supply will lead to 0.022 increase in stock returns. The interest rate seems to have a somewhat negative relationship with changes in stock market returns.

At 5% significance level and 95% confidence interval, CPI had a 0.008 level of significance, Interest rate had a 0.002 while Money supply showed a significance of 0.803. From these significant tests, money supply seems to be less significant in explaining the changes in prevailing stock market returns. This could be attributed to lagged response and monetary policy transmission mechanism.

## Descriptive Statistics

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
CPI	14	-.9934	3.9000	.419829	1.4605708
INTRATE	14	2.96	13.29	8.2814	3.46860
MONEYM1	14	-.1514	.6850	.180421	.2063452
NSEINDEX	14	-.3306	.4064	.045357	.2259025
Valid N (listwise)	14				

The descriptive statistics table shows the original values evaluated in terms of measures of central tendency. Since Annual Rate of Change values were used, the N-value reduced to Fourteen. CPI shows the highest standard deviation.

### 4.3 Summary & Interpretation of findings

The result of the multiple regressions shows that all the independent variables are positive and insignificantly related to stock market prices; except the interest rate that is negatively and insignificantly related to stock market prices. The findings in this study indicate that monetary policies have a great influence on stock market returns. The Central Bank of Kenya through its Monetary Policy Committees is mandated to maintain stable rates in order to spur economic growth. In the multiple regressions model summary result shown in the model summary, results revealed that only 65.1% of the variation in stock prices in this model can be explained by the independent variables – M1, INTR, and CPI. This could be said that the monetary policy variables have moderate explanatory power on equity prices. The regression result similarly, shows that all the explanatory variables i.e. M1 & CPI are positively correlated with NSE 20 Share Index except the INTR that is negatively correlated with NSE Index. In fact, the “R” value in the model summary reveals that there is a strong correlation between the 20 share index and monetary policy variables.

From the result therefore we can empirically state that there is significant effect of monetary policy variables on equity Prices in Kenya. This is proved by the monetary policy variables used in this study. This research finding confirms Osuagwu (2009) that negative relationship exists between interest rates and stock market returns. Furthermore, the study confirms the *apriori* expectation that consumer price index has a positive relationship with stock prices.

Other studies such as Choudhry (2001) find a positive relationship between stock returns and inflation in four high inflation countries since having examined the relationship between stock

returns and inflation over long-horizons and their results support the Fisher Hypothesis as the horizon widens.

Based on the money demand and the quantity theory of money, Fama and Marshal (1992) find that negative effect of inflation on stock return is generated by real economic fluctuations, by monetary fluctuations or changes in both real and monetary variables. The negative and positive effects of monetary policy variables on stock returns found in this study have several practical implications. Also, research evidence here provides that stock prices appear to react mainly negatively to rising interest rates. One reason suggested for this relationship is the expected returns on stocks in which the higher interest rate has a direct bearing. Thus, the higher interest rates would directly affect the returns on stocks causing prices to fall consistent with the theory. Whenever the interest rate on treasury securities increases, the investors tend to switch out of stocks causing fall of stock prices. Therefore, this implies that a certain level of predictability is present in stock prices that can be explained through the behaviour of the three month Treasury bill rate as shared with Menike.

The stances drawn are the Monetary committee of CBK affects the stock market returns in Kenya. The monetary policies are meant to regulate several variables of the economy to ensure financial and currency stability. From the data presented in this research project, the three independent variables studied explain up to 65.10% of the changes in Stock Market returns and this implies that there are other variables important to stock Market returns in Kenya.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.**

### **5.1 Summary**

The study has been able to examine the influence of monetary policy variables on stock market performance as measured by growth rate of stock market returns for the period 1998 through 2012 for companies listed at The Nairobi Securities Exchange. This was done through statistical method of analysis using SPSS on the data and analyzing their impulse response functions, graphs and forecast variance decomposition. The study was based on theories such as the quantity theory of money, transmission mechanism of money, rational expectations theory, efficient market hypothesis and theory of money neutrality and empirical evidence from developed countries, developing countries and Kenya.

According to the regressions model results, 65.1% of the variation in stock prices & returns in this model can be explained by the independent variables – M1, INTR, and CPI. This could be said that the monetary policy variables have some explanatory power on equity prices. The regression result similarly, shows that all the explanatory variables i.e. M1 & CPI are positively correlated with NSE 20 Share Index except the INTR that is negatively correlated with NSE Index. In fact, the “R” value in the model summary reveals that there is a strong correlation between the 20 share index and monetary policy variables.

From the result therefore we can empirically state that there is some significance effect of monetary policy variables on equity Prices in Kenya. This is proved by the monetary policy variables used in this study. The correlation test performed on the data showed presence of significant relationship in growth of Money supply, Interest rates and Inflation on Stock Market Returns. Money supply growth & CPI exerted positive shocks on stock market returns in the short run and positive shocks in the long run in Kenya. The converse is true for Interest rate as proxied by 91-day Treasury Bill rate.

## **5.2 Conclusions**

From these results, it seems obvious that monetary policy tools affect the stock market returns. From the variance decomposition, it is evident that monetary policy does not affect stock markets immediately but only after certain lags which are not constant. However, the result seems to suggest that stock market returns is affected mainly by stock market factors and changes in money supply which were the main sources of variation in stock market performance in the stock market in Kenya.

Inflation rate did not really influence much variation in stock market returns contrary to many of the literature reviewed, but stock markets still responded to changes in inflation rate. This research work postulates that stock market factors (such as investors' confidence) and money supply in the economy are the major determinants of stock market performance. In conclusion therefore, central bank officials should make conscious effort to determine the principal determinants of stock market returns and implement appropriate policies that would enhance the development of their stock markets.

Monetary policy is a significant determinant of long-run stock market returns in Kenya. In other words, long-run behavior of stock market returns in Kenya is influenced largely by monetary variables. Specifically, high Treasury bill rate reduces stock market returns indicating that monetary policy efforts have been to slow down the economy. While current and one period lag interest rate exert a positive and significant influence on the stock market returns. A complementary information on the dynamic behavior of the variables provided by forecast error variance decomposition shows that the predominant sources of returns fluctuations are due largely to interest rate shocks and returns shocks. This result in sum indicates that the innovations of rate of interest can be a better predictor of stock market returns in Kenya. A high interest rate attracts more savings and discourages the flow of capital to the stock markets leading investors to demand for a higher risk premium which impedes investment and slows down economic development. Whereas a low interest rate encourages higher capital flows to the stock market in expectation for a higher rate of return.

### **5.3 Policy Recommendations**

Based on the results obtained from this study, I hereby proffer some policy recommendations and options which central bank officials and other monetary policy formulators can apply in various countries in order to enhance stock market performance in terms of returns in their countries.

Knowledge of monetary transmission mechanism is essential to policymakers because different mechanisms may imply that different targets are optimal or appropriate. The stock market

channel, for example, suggests that the price level is the appropriate target of monetary policy; the money channel and the creditworthiness channels imply that the interest rate should be targeted; the bank-dependent borrower channel suggests the quantity of credit. Therefore, policymakers in Kenya as a matter of necessity should fully understand the appropriate mechanism operational in this country and the channel through which monetary impulses affect stock market returns.

Central bankers and stock market participants should be aware of the relationship between monetary policy and stock market returns in order to better understand the effects of policy shifts. Monetary authorities in particular face the dilemma of whether to react to stock price movements, above and beyond the standard response to inflation and output developments. There is an ongoing debate in the monetary policy rules literature between the proactive and reactive approach. On the one hand, the proactive view advocates that monetary policymakers should alter interest rates in response to developing stock price bubbles in order to reduce overall macroeconomic volatility. On the other hand, according to the reactive approach, monetary authorities should wait and see whether the stock price reversal occurs, and if it does, to react accordingly to the extent that there are implications for inflation and output stability. Hence, the reactive approach is consistent with an accommodative ex-post response to stock price changes.

It is apparent then, that the empirical verification of the effect of monetary policy on stock market returns is important for monetary policy formulation. The stock market is one of the most important financial institutions operating in an economy and this makes it very necessary for the apex regulatory financial institution to monitor its activities in order to achieve stability

and maintain development over the long run. The central banks of all countries of the world should adequately regulate stock market activities in order to maintain their transparency. Also, stock market officials should work hard to reduce the frequency of asset price bubbles which do not help stock market development in the long run.

The stock market operates in a macroeconomic environment and thus its performance is very dependent on investors' confidence and the general perception of the health of the economy. Therefore, monetary policymakers need to make the environment enabling and free of fear in order to bring about development of the stock markets. They also need to take into account speculations going on in the economy and incorporate these speculations into their formulation framework.

Policymakers should make use of instruments such as bail-outs and interest rate reductions in times of crisis to rescue stock markets which can barely help themselves in such periods.

Central banks also need to recognize their limitations and not attempt to do too much so as not to overheat the economy and worsen it. There is a limit to which monetary policy can be effective in affecting stock market returns and beyond this limit, any attempt to further use monetary policy to influence stock markets would be ineffective at best or harmful in adverse circumstances.

#### **5.4 Limitations of the study**

The limitation of this study is its pioneering nature because it did not benefit from the relevant literature in the local context on the subject, which therefore limits insights brought by synthesizing the existing local knowledge. Therefore, firm conclusions about the directions of causality implied in the model cannot be drawn. Thus, relationships among variables must be interpreted with caution. Interpretations of models using autoregressional modelling are also not proof of causality. True causal inferences can only be drawn testing models using longitudinal data.

The data collection was confined to only 20 Companies listed on the Nairobi Securities Exchange since this was the readily available information. Various constraints were faced during data collection. The replication of the study at different regions of Africa would enable better generalizability of the findings of the study. At the same time data collection in all listed companies could have elicited better and improving findings.

The study was limited to companies in Kenya. Kenya being a collectivistic country, most of the trends are replicated year in year out. Consideration of other factors might have revealed interesting findings. The variables used are proxies which are bound to change with passage of time.

The present study has relied largely on quantitative methodology of data collection and is therefore restrictive. Therefore, more of qualitative methodology of data collection should be undertaken in future to provide wider perspective to the present study. For instance, the research design can employ case study methodology or content analysis to provide a holistic picture to the given subject.

### **5.5 Suggestions for further Studies.**

Some empirical work that disaggregates the stock prices into bank and non-bank sectors should be done to capture the more accurately the effect monetary policy has on non-bank stock returns. It would be interesting to identify and establish the relationship between monetary policy and stock market performance and to determine if there are similarities or differences in the reactions of stock markets to monetary policy in developed and developing countries.

Since this study was limited to the effect of Monetary policy on Stock Market Returns, further research can focus on the effect of both Fiscal and Monetary policy on stock market performance in general taking into consideration market capitalization. This will bring out the contemporaneous relationship between the two variables. It is highly advisable that the reverse effect of Stock returns on Monetary Policy should also be evaluated to gain an in-depth understanding of capital markets on economic growth.

## REFERENCES

- Anderson, D.R; Williams T.A., Sweeney, D.J(2009). *Essentials of Contemporary business Statistics (International Edition)*.Maso, South-Wester Cengage Learning.
- Akinlo A.E, Saibu M.O and Olamide E.G. (2002) “An Econometric Investigation of the Relative Impacts of Monetary Policy on Commercial and Merchant Banks in Nigeria.” *Ife Journal of Economics and Finance*. Vol. 5 (1 and 2)
- Ammer, J., Vega, C., and Wongswan, J. (2010) International transmission of U.S. monetary policy shocks: Evidence from stock prices, *Journal of Money, Credit and Banking* 42, 179–198.
- Andersen, Torben G., Bollerslev, Tim, Diebold, Francis X. and Clara Vega (2003). Micro Effects of Macro Announcements: Real-Time Price Discovery in Foreign Exchange. *American Economic Review* 93(1): 38-62.
- Angeloni, Ignazio and Michael Ehrmann (2003). Monetary Policy Transmission in the Euro Area: Any Changes After EMU? ECB Working Paper No. 240. New York.
- Banerjee, Prashanta K. and Adhikary, Bishnu.K. (2006) “Dynamic Effects of Interest Rate and Exchange Rate Changes on Stock Market Returns in Bangladesh.” pp 1-26.
- Basistha, Arabinda and Kurov, Alexander. (2008) “Macroeconomic Cycles and the Stock Market’s Reaction to Monetary Policy.” pp 1-33.
- Bernanke, B., & Gertler M., (1995). Inside the Black Box: The Credit Channel of the Monetary Policy Transmission. *Journal of Economic Perspectives* 9, 27-4-8.
- Berk, J., Demarzo, P., & Harford, J. (2009). *Corporate Fiance*. New York: Pearson Prentice Hall CDSC. (2004).
- Bernanke, B.S. & Kuttner, K.N. (2005). What explains the stock market’s reaction to Federal Reserve Policy? *Journal of Finance*, 60, 1221–1257.
- Bjornland, H. C and Lietemo, K. (2009) Identifying the interdependence between US monetary policy and the stock market. *Journal of Monetary Economics*, 56, 275–282).
- Bordo, Michael D. and Wheelock, David C. (2007) “Stock Market Booms and Monetary Policy in the Twentieth Century.” Federal Reserve Bank of St. Louis. pp 1-10.

Bordo, Michael D.; Dueker, Michael J. and Wheelock, David C. (2007) “Monetary Policy and Stock Market Booms and Busts in the 20th Century.” Federal Reserve Bank of St. Louis Working Paper Series. Working Paper 2007 020A. pp 3-30.

Bordo, Michael D.; Dueker, Michael J. and Wheelock, David C. (2008) “Inflation, Monetary Policy and Stock Market Conditions: Quantitative Evidence from a Hybrid Latent-Variable VAR.”

Brooks, C. (2002). Introductory econometrics for Finance. *Cambridge University Press*; United Kingdom.

Brooks, R., and Del Negro, M., 2002. The Rise in Comovement Across National Stock Markets: Market Integration or IT Bubble? Federal Reserve Bank of Atlanta Working Paper 2002-17.

Campbell, J. (1987) Stock returns and the term structure, *Journal of Financial Economics* 18, 373–399.

Clarida, R., Gali, J., and Gertler, M. (2000) Monetary policy rules and macroeconomic stability: Evidence and some theory, *Quarterly Journal of Economics* 115, 147–180.

Cassola, N., & Morana, C. (2004). Monetary policy and the stock market in the euro area. *Journal of Policy Modelling*, 26, 387–399.

Chami, Ralph; Cosimano, Thomas F. and Fullenkamp, Connel. (1999) “The Stock Market Channel of Monetary Policy”. IMF Working Paper WP/99/22. pp. 1-15.

Chen, G., Du, Y., & Zhang, Y. (2009). What Determines China's Volatile Stock Returns? A Variance Decomposition Analysis. *Xiemen University* , 3-19.

Chen, N., Roll, R., & Ross, S. (1986). Economic Forces and the Stock Market . *Journal of Business* , 59 (3), 383-403. CMA. (2011).

Christiano, L., M. Eichenbaum, and C. Evans, (2000). “Monetary Policy Shocks: What Have We Learned and to What End?” in *Handbook of Macroeconomics* (Amsterdam: North Holland).

Christiano, Lawrence J, Eichenbaum, Martin, Evans, Charles (1996). The Effects of Monetary Policy Shocks: Evidence from the Flow of Funds. *Review of Economics and Statistics* 78(1): 16-34.

Conover, C Mitchell, Jensen, Gerald R, Johnson, Robert R (1999). Monetary Environments and International Stock Returns. *Journal of Banking and Finance* 23(9): 1357-81.

Conover M., Jensen, G., Johnson, R., 1999. Monetary Environments and International Stock Returns. *Journal of Banking and Finance* 23, 1357-1381.

- Davig, Troy and Gerlach, Jeffrey R. (2006) "State-Dependent Stock Market Reactions to Monetary Policy." *International Journal of Central Banking*, pp 1-7.
- De Long Bradford J. and Olney Martha L. (2009): "Macroeconomics" Second Edition. McGraw Hill Press. pp 4-42.
- Dickey, D.A. & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74, p. 427–431.
- Dubravka, B., & Petra, P. (2010). *Do macroeconomic factors matter for stock returns? Evidence from estimating a multifactor model on the Croatia Market*. Zagreb: University of Zagreb.
- Durham, Benson J. (2002) "The Effect of Monetary Policy on Monthly and Quarterly Stock Market Returns: Cross-Country Evidence and Sensitivity Analyses." Board of Governors of the Federal Reserve System. pp. 1-20.
- Durham, Benson J. (2002) "Does Monetary Policy Affect Stock Prices and Treasury Yields"? An Error Correction and Simultaneous Equation Approach." pp 1-10.
- Ehrmann, Michael and Fratzscher, Marcel. (2004) "Taking Stock: Monetary Policy Transmission to Equity Markets." pp 5-20.
- Ehrmann, M., Fratzscher, M. (2004) Taking stock: Monetary policy transmission to equity markets, *Journal of Money Credit and Banking*, **36**, 719--738.
- Fabozzi F. & Modigliani F. (1995). *Capital Market Institutions and Instruments*. New Jersey: Prentice Hall, Inc.
- Fama, E., and French, K., (1989). Business Conditions and Expected Returns on Stocks and Bonds. *Journal of Financial Economics* 25, 23-49.
- Fama, E., & Marshall, K. (1992). The Cross-Section of Expected Stock Returns. *Journal of Finance* , 47 (2), 427-465.
- Fuhrer, J., 1995. Monetary policy and the behaviour of long-term real interest rates. *New England Economic Review* Sep-Oct 1995, 39-52.
- Ganley, J. and C. Salmon (1997). The Industrial Impact of Monetary Policy Shocks: Some Stylised Facts. Bank of England Working Paper Series No. 68
- Gertler, Mark, Gilchrist, Simon (1994). Monetary Policy, Business Cycles, and the Behavior of Small Manufacturing Firms. *Quarterly Journal of Economics* 109(2): 309- 40

Gertler, M., and Gilchrist, S., (1993). The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence. *Scandinavian Journal of Economics* 95, 43-64.

Gitobu M. (2000) Determining the Influence of Macroeconomic Indicators on Stock Market Indicators-Published MBA dissertation, University of Nairobi.

Günsel, Nil and Çukur, Sadik (2007) “The Effects of Macroeconomic Factors on the London Stock Returns: A Sectoral Approach.” *International Research Journal of Finance and Economics*. Issue 10 (2007) pp 1-13

Hayashi, F. (2000) *Econometrics*, Princeton University Press, Princeton, New Jersey.  
Hecht, P. and Vuolteenaho, T. (2006) Explaining returns with cash-flow proxies, *Review of Financial Studies* 19, 159–194.

Hayford Marc D. and Malliaris A.G. (2003) “Monetary Policy and the U.S Stock Market” pp 2 13.

<http://www.nse.co.ke> Nairobi Securities Exchange Website

[http://www.cma.or.ke/index.php?option=com\\_content&task=view&id=16&Itemid=36](http://www.cma.or.ke/index.php?option=com_content&task=view&id=16&Itemid=36)

Ioannidis, C. & Kontonikas, A. (2008). The impact of monetary policy on stock prices. *Journal of Policy Modelling*, 30, 33-55.

Jensen, G.R., Johnson, R.R. (1995). Discount rate changes and security returns in the US, 1962-1991. *Journal of Banking and Finance* 19: 79-95.

Jensen, G.R., Mercer, J.M., Johnson, R.R. (1996). Business conditions, monetary policy and expected security returns. *Journal of Financial Economics* 40: 213-237.

Kaplan, Steven N, Zingales, Luigi (1997). Do Investment Cash Flow Sensitivities Provide Useful Measures of Financing Constraints. *Quarterly Journal of Economics* 112(1): 169-215.

Kuttner, K. (2001). Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Market. *Journal of Monetary Economics* 47, 523-544.

Kothari, C. R. (2009). *Research Methodology - Methods & Techniques*. New Dehli: Wiley Publishers.

Lamont, Owen, Polk, Christopher, Saa-Requejo, Jesus (2001). Financial Constraints and Stock Returns. *Review of Financial Studies* 14(2): 529-54.

Lechner, Michael (2002). Program Heterogeneity and Propensity Score Matching: An Application to the Evaluation of Active Labor Market Policies. *Review of Economics and Statistics* 84(2): 205-220.

Lastrapes, W.D. (1998). International evidence on equity prices, interest rates and money. *Journal of International Money and Finance* 17, 377–406.

Li, E. and Palomino, F. (2009) Monetary policy risk and the cross-section of stock returns. Unpublished working paper, University of Michigan.

Liu, W. (2006). A Liquidity-augmented capital asset pricing model. *Journal of Financial Economics*, 82, 631-671.

Lobo, B. J. (2000). Asymmetric effects of interest rate changes on stock prices. *The Financial Review* 35: 125-144.

Marshall, D.A. (1992) “Inflation and Asset Returns in a Monetary Economy” *Journal of Finance* Vol. 47 No.4 PP1315-42

Maysami, Ramin C.; Howe, Lee C. and Hamzah, Mohamad A. (2004) “Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore’s All-S Sector Indices.” *Jurnal Pengurusan* 24 (2004) pp 47-77

McLaney, E. (2009). *Business Finance*. London: Pearson Education Limited.

Menike, L.M.C.S. (2006) “The Effect of Macroeconomic Variables on Stock Prices in Emerging Sri Lankan Stock Market” *Sabaragamuwa University Journal*, Vol. 1 pp 50-67

Monther, C., & Kaothar, G. (2010). Macroeconomic and institutional determinants of Stock Market Development. *The International Journal of Banking and Finance* , 7 (1), 139-140.

Ngigi R.W.(2000) “Impact of Fiscal and Monetary Policies on Stock Market Performance in Kenya’MBA Research project, The University of Nairobi.

NSE. (2011). *Regulatory Framework*. Retrieved August 1st , 2011, from Nairobi Stock Exchange: <http://www.nse.co.ke/regulatory-framework/category/42-nairobi-stock-exchange-nse.html>

Osuaagwu, E. S. (2009) "The effect monetary policy on stock market performance in Nigeria" Nigeria Journal of Securities and Finance (NSE) Vol. 14(2) September.

Ologunde A.O., Elumilade D.O. and Asaolu T.O. (2006) "Stock Market Capitalization and Interest Rate in Nigeria: A Time Series Analysis." International Research Journal of Finance and Economics. pp 1-14.

Osinubi, Tokunbo S. (2002) "Does Stock Market Promote Economic Growth In Nigeria?" pp 1-20.

Patelis, A. (1997). Stock return predictability and the role of monetary policy. *Journal of Finance*, 52, 1951–1972.

Peersman, Geert and Frank Smets (2002). The Industry Effects of Monetary Policy in the Euro Area. ECB Working Paper No. 165

Perez-Quiros, Gabriel, Timmermann, Allan (2000). Firm Size and Cyclical Variations in Stock Returns. *Journal of Finance* 55(3): 1229-62.

Rigobon, Roberto and Brian Sack (2002). The impact of monetary policy on asset prices. NBER Working Paper No. 8794.

Rigobon, Roberto and Brian Sack (2003). Measuring the Response of Monetary Policy to the Stock Market. *Quarterly Journal of Economics* 118(2): 639-669.

Rigobon, Roberto and Sack, Brian (2001) "Measuring the Reaction of Monetary Policy to the Stock Market." NBER Working Paper Series. Working Paper 8530. pp 2-7.

Said, E. S. & Dickey, D. A. (1984). Testing for Unit Roots in Autoregressive Moving Average Models of Unknown Order. *Biometrika*, 71, 599–607.

Samarakoon, L.P. (1996b) Stock Market Returns and Inflation: Sri Lankan Evidence. Sri Lankan Journal of Management 1, 293 - 311.

Sellin, P. P. (2001). Monetary Policy and the Stock Market: Theory and Empirical Evidence. *Journal of Economic Surveys*, 15(4), 491-541.

Sellin, Peter. (1998) "Monetary Policy and the Stock Market: Theory and Empirical Evidence." Pp 2-30.

Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance* , 425-42.

Taylor, J., 1993. Discretion Versus Policy Rules in Practice. Carnegie-Rochester Conference Series on Public Policy 39, 195-214.

Thorbecke, W. (1997). On stock market returns and monetary policy. *Journal of Finance* 52, 635–654.

Tobin, James (1978). Monetary policy and the economy: the transmission mechanism. *Southern Economic Journal* 44: 421-431.

Wang, L. (2010). Empirical Analysis of Macroeconomic Factors Affecting Stock Prices. *Orient Academic Forum* , 132-133.

## APPENDIX

### SPSS Data Output.

#### AREG

MODEL: MOD\_1

Model Description:

Variable: NSEINDEX

Regressors: CPI

INTRATE

MONEYM1

95.00 percent confidence intervals will be generated.

Split group number: 1 Series length: 14

No missing data.

Melard's algorithm will be used for estimation.

Termination criteria:

Parameter epsilon: .001

Maximum Marquardt constant: 1.00E+09

SSQ Percentage: .001

Maximum number of iterations: 10

Initial values:

AR1 .00000

CPI -.07107

INTRATE -.03272

MONEYM1 .29101

CONSTANT .29363

Marquardt constant = .001

Adjusted sum of squares = .35117989

Iteration History:

Iteration	Adj. Sum of Squares	Marquardt Constant
1	.34794057	.00100000
2	.34787889	.00010000

Conclusion of estimation phase.  
 Estimation terminated at iteration number 3 because:  
 Sum of squares decreased by less than .001 percent.

**FINAL PARAMETERS:**

Number of residuals 14  
 Standard error .19653564  
 Log likelihood 5.4084862  
 AIC -.81697233  
 SBC 2.3783143

**Analysis of Variance:**

	DF	Adj. Sum of Squares	Residual Variance
Residuals	9	.34787855	.03862626

Variables in the Model:

	B	SEB	T-RATIO	APPROX. PROB.
AR1	-.09850744	.34896814	-.2822820	.78411130
CPI	-.07173969	.04004895	-1.7913003	.10685113
INTRATE	-.03200259	.01559924	-2.0515471	.07043722
MONEYM1	.30676534	.27472428	1.1166299	.29307547
CONSTANT	.28429558	.15435898	1.8417820	.09863180

Covariance Matrix:

	AR1
AR1	.12177876

Correlation Matrix:

AR1
1

AR1 1.0000000

Regressor Covariance Matrix:

	CPI	INTRATE	MONEYM1	CONSTANT
CPI	.00160392	.00016374	.00176385	-.00235454
INTRATE	.00016374	.00024334	.00027820	-.00212107
MONEYM1	.00176385	.00027820	.07547343	-.01681259
CONSTANT	-.00235454	-.00212107	-.01681259	.02382669

—

Regressor Correlation Matrix:

	CPI	INTRATE	MONEYM1	CONSTANT
CPI	1.0000000	.2620957	.1603150	-.3808747
INTRATE	.2620957	1.0000000	.0649176	-.8808843
MONEYM1	.1603150	.0649176	1.0000000	-.3964658
CONSTANT	-.3808747	-.8808843	-.3964658	1.0000000

The following new variables are being created:

Name	Label
FIT_1	Fit for NSEINDEX from AREG, MOD_1
ERR_1	Error for NSEINDEX from AREG, MOD_1
LCL_1	95% LCL for NSEINDEX from AREG, MOD_1
UCL_1	95% UCL for NSEINDEX from AREG, MOD_1
SEP_1	SE of fit for NSEINDEX from AREG, MOD_1

# Pie Chart

