THE EFFECT OF MACROECONOMIC FACTORS AND POLITICAL EVENTS ON THE PERFORMANCE OF NAIROBI SECURITIES EXCHANGE IN KENYA

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A Research Project Submitted in Partial Fulfilment of the Requirements for the Award of the Degree of Master of Arts in Economics in the School of Economics in the University of Nairobi, Kenya.

October, 2015
DECLARATION

This research paper is my original work and has not been submitted for the award of a degree in any other University or institution of higher learning.

Signed: ……………………………………… Date: ……………………………………..
DOMINIC NTABO AMORO

X50/80175/2012

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University of Nairobi

Signed: ……………………………………… Date: ……………………………………..
DR. ELIZABETH OWITI
School of Economics, 
University of Nairobi
DEDICATION

To my family: my brother, my sisters and my wife Emily and my sons Michael and Zebedee and in memory of my late father, mother and brothers, Michael and Alfred.
ACKNOWLEDGEMENT

My foremost gratitude goes to almighty God for enabling me through my academic life. I highly acknowledge the efforts and commitment of my Supervisors; Dr. Elizabeth Owiti and Dr. Purna Samanta, whose close and intellectual guidance enabled me to write the paper. Their encouragement and positive criticisms have been quite invaluable. I also thank Dr. Owen Nyang’oro for his wonderful contribution.

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However, the results of this study are my own thoughts and not necessarily those of the personalities mentioned above. I am, exclusively accountable for the contents and any shortcomings therein.
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>Augmented Dickey Fuller</td>
</tr>
<tr>
<td>APT</td>
<td>Arbitrage Pricing Theory</td>
</tr>
<tr>
<td>CAPM</td>
<td>Capital Asset Pricing Model</td>
</tr>
<tr>
<td>CMA</td>
<td>Capital Markets Authority</td>
</tr>
<tr>
<td>ECM</td>
<td>Error Correction Model</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>IPO</td>
<td>Initial Public Offer</td>
</tr>
<tr>
<td>MPT</td>
<td>Modern Portfolio Theory</td>
</tr>
<tr>
<td>MSCI</td>
<td>Morgan Stanley Capital Investment Index</td>
</tr>
<tr>
<td>NASI</td>
<td>NSE All Share Index</td>
</tr>
<tr>
<td>NSE</td>
<td>Nairobi Securities Exchange</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Square</td>
</tr>
<tr>
<td>US</td>
<td>United States</td>
</tr>
<tr>
<td>VECM</td>
<td>Vector Error Correlation model</td>
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<tr>
<td>VIF</td>
<td>Variance Inflation Factor</td>
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ABSTRACT

Stock market plays significant positive role in development of the capital market. Political events and changes in macroeconomic variables have been suspected to affect the trading volume and stock return. Thus, this paper analyses the effect of macroeconomic factors and political events on the performance of NSE in Kenya covering the period from January 2000 to December 2014 using inflation, exchange rate, money supply, 91-Day Treasury bill and political events represented using dummy variables. The study uses secondary data the main source of which is the Capital Markets Authority quarterly bulletins and the Central Bank of Kenya statistics.

OLS was applied to estimate the effect of macroeconomic factors and political events on the performance of NSE in Kenya. The regression results show that exchange rate, money supply, 91-Day Treasury bill and political events were significant except inflation. Money supply and political instability incidents shows a positive and strong correlation to NSE. Inflation had a positive correlation to NSE, although the relationship was not significant. The result also shows that exchange rate and 91-Day Treasury bill had negative correlation to NSE performance but was significant.

Therefore, a joint effort from individuals, stakeholders, economists, investors and government is required to secure effectiveness of the financial market in Kenya since financial markets are dynamic, and affected by various macroeconomic factors and some political instability incidents over the recent past like the 2007/2008 post-election violence.. The result of the study may encourage and motivate the investors and policy makers both domestically and internationally. The government should ensure secure environment that would increase morale of investors and help them to make vital strategic decisions.
CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 Stock Market and Economic performance

Stock markets\(^1\) are economic institutions which enhance the efficiency in capital formation and allocation (Olweny and Kimani, 2011). The stock market acts as a barometer in an economy in that it provides vital information on the future of the economy as it reflects how an economy performs (Srivastava, 2010). Both developing and developed countries have formed stock exchange markets to help in raising long term capital for firms that are allowed to subscribe shares and stocks; it therefore assists to channel funds from savings to investments (Mohammad, Hussain and Ali, 2009). Volatilities in macroeconomic factors in an economy cause firms or market participants\(^2\) to increase or decrease trading activities. Stock market is therefore important as it acts as a mediator between borrowers and savers and it’s through stock market operations where borrowers and lenders preferences are harmonised.

The performance of stock market reflects on institutional framework as well as political environment and is influenced by the nature of current economic situation which is reflected by variations in macroeconomic variables such as inflation rate, Treasury bill, exchange rate and money supply in the economy (Wawire, Kirui and Onono, 2014). Stock market’s correlation with the domestic and global stability of a country is strong and the unsound financial standings, national and global uncertainty affect stock market exchange performance in a country (Khan, Saif and Rehman, 2013).

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\(^1\) The term stock market refers to a place where securities are issued and traded through exchange or over the counter.

\(^2\) Market participants in the stock markets include individual and institutional investors’ like mutual funds, banks, insurance companies and public corporations.
Kenya is an emerging economy and therefore its economic performance is often pegged on a number of parameters, which include but not limited to: the performance of the stock markets, foreign direct investment, inflation rates and interest rates. These parameters are affected majorly by the political stability/instability, which is equally affected by the electoral process in the country as most electoral processes and outcomes in developing countries are marred with a lot of uncertainties which affect investors’ attitudes (Wawire et al., 2014).

The correlation between macroeconomic factors and stock return arises because capital asset pricing model (CAPM) operates on an assumption that the only concern of investors is uncertainty about securities future prices (Sharpe, 1964). But investors take into account the other risks that may affect their investment like political election periods since financial crisis tend to be much larger in those periods.

Stock market can be used to predict the economy since stock fluctuations have a direct effect on aggregate spending. When there is an increase in stock market, investors are wealthier and they spend more and because of that the economy grows and the reverse is true (Pearce, 1983).

1.1.2 Macroeconomic Variables and Stock Market Performance

Wawire et al. (2014) argue that the relationship between stock market performance and macroeconomic variables is close like inflation rate, 91-Day Treasury bill, exchange rate and money supply. These variables are vital in determining stock market performance. These factors are important to investors in making investment decisions as they describe state of macro economy. This argument has been backed up strongly by Lee, (1998) who perceives stock markets as vehicles meant to implement privatization programs where they further play
a significant role in the development of frontier economies. Some of the variables considered include:

1.1.2.1 Inflation rate
Inflation rate simply means change in general price level in an economy over a specified period of time. Inflation is expected to determine the required rate of return from which the value of investment is derived (Reilly, 1994). Inflation is expected to have some impact on stock market. Kaul (1990) noted that evidence from U.S., UK, Canada and Germany showed that relationship between stock market performance and the expected inflation rate is significant. The evidence from U.S., UK, Canada and Germany further revealed that this negative relationship usually changes depending on whether the monetary authority is using the interest rate and money supply as an instrument to control inflation.

1.1.2.2 Exchange rate
Exchange rate refers to the value of a foreign country’s currency expressed in terms of the home country’s currency. Ma and Wenchi (1990) did examine reactions in stock market to changes in exchange rate. They noted that choice of currency denomination was vital because of the increasing risk for international investments. They reiterated that if a country is export-oriented and the currency for instance appreciates, the competitiveness of the exports reduces thus a negative impact on the stock market domestically. This is because exporting listed companies will be less profitable thus losing the attractiveness to investors. The reverse is true if the currency depreciates exports becomes competitive abroad (Wawire et al. 2014).
1.1.2.3 91-Day Treasury bill

This is a short term debt obligation with a maturity of three months. It is issued by a national government for regulating money supply. It is regarded as risk free rate of return in the market (Oriwo and Ochieng, 2012).

1.1.2.4 Money supply

This is the amount of money circulating in an economy at some point in time. It is the stock of money available in an economy and this involves minted coins and printed notes, money available in deposit accounts and liquid assets. Monetary portfolio theory suggests that a change in money supply alters price of assets in the stock market thus a positive correlation exists between stock market and change in money supply.

Friedman and Schwartz (1963) explained the relation between return on stocks and money supply. They asserted that money supply in an economy affect the economy as a whole consequently expected stock returns. An increase in growth of M2 (i.e. currency in circulation; notes and coins and demand deposits in savings account) implies resources available to buy securities. But this may lead to inflation hence reducing stock prices (Fama, 1981).

1.1.3 Political Events and Stock Market

Political events play a vital role in explaining stock market performance variations and degree of uncertainty in the stock market (Tzachi, 2003). For instance, during election periods, politicians soothe investors and firms to fund their political affiliations (Worthington, 2006). Therefore, the patterns of stock market performance with prices reflect the electoral prospects of the competing parties (Bechtel and Fuss, 2006).
Market participants expect positive stock market performance following a new regime in office. Market participants and scholars continue to analyse effect of political change in the stock market whether or not it has effect on stock market performance (Chuang and Wang, 2009).

Political events affect stock price either positively or negatively depending on the intensity of the event (Malik, Hussain and Ahmed, 2009). Major political events that we expect to affect the behaviour of investors both local and foreign include: the general elections 2002, 2007 and 2013, the post-election violence in the first quarter of 2008 and referenda like the one of 2005 and 2010 as well as Nubian-Luo 2001 crisis in Kibera.

Political economy in a country can result to a significant influence on consumption by individuals and income distribution hence affecting the activities in a stock market. For instance, during elections voters in democratic states elect parties which best represent their person interests (Menge, Mwangi and Kimani, 2014).

1.1.4 Financial Markets in Kenya

Financial markets consist of money markets that deal with short-term securities and capital markets that deal with long-term securities. Financial markets facilitates trading, hedging, diversification and pooling of risks (Levine, 1997). However, the role of financial markets in developing countries has been constrained by the fact that majority of them are in their earlier stages of development. These developing markets have a low number of listed companies and low capitalization among market participants (Yartey and Adjasi, 2007). But according to Ndikumana (2001), these markets are characterized by greater degree of dependence on remittances from other countries, poor market infrastructures and weak institutional
frameworks. Capital market plays a role in mobilizing both local and international capital flows in an economy (Osei, 1998).

The financial sector comprises of commercial banks, investment banks, insurance, microfinance banks, non-bank financial institutions, securities companies. The banking sector play an important role in financial intermediation, taking deposits from those having excess funds and lending them to those who need it in form of loans.

In Kenya, high cost of operating banks and default risks has led to inefficiency in financial sector thus high interest rates charged on borrowers and this may hinder growth in securities investment. As a result of failure to identify credit worthy customers to enable money markets reduce default risk needs active collaboration between Central bank and commercial banks (Oduor, Karingi and Mwaura, 2010).

1.1.5 Trend Analysis of some Economic Variables

To illustrate the trends, line graphs has been used for the specific variables.

Figure 1.1: A graph showing the trend for NSE 20-share index from 2000 to 2014.

Source: Researcher’s analysis based on data from CMA quarterly bulletin
From figure 1.1, the NSE-20 share index declined from the year 2000 until the election year 2002 after which it showed an upward trend until 2006. From the year 2007 to the end of the year 2008, the index decreased. The index fell in 2009 as investors focused their portfolio on the bond market (Mwega, 2010). In the year 2011 there was a decline until start of year 2012 when there was an increase again until the year 2014.

Figure 1.2: A graph showing the trend for Inflation rate from 2000 to 2014.

![Trend for inflation rate](image)

Source: Researcher’s analysis based on data from Central Bank monthly statistical bulletins.

Figure 1.2, Inflation rate has been fluctuating over years. For instance it increased from 2001 to 2004. It decreased to 2005 and increased from 2007 to 2008 tremendously because of the post-election violence and political crisis which destabilized the economy (Koech and Rotich, 2013). From 2008 it declined until 2010 when inflation was under control by Central Bank of Kenya. In 2011 inflation was high as it was fuelled by drought in 2010 which led to high prices for stable food like maize (Were and Tiriongo, 2012). In the year 2012 it declined as it was controlled by Central Bank. It rose again from 2013 to 2014.
From the above figure, the exchange rate has been almost stable between Kshs 70 to 80 per US$1 since the year 2000 to 2006. In 2007 it appreciated in value as it was below Kshs 60/$. From 2008 it started depreciating until 2011 rising till the year 2011, the Kenyan currency depreciated to almost Kshs 90 for one dollar and later it declined mid 80s after the intervention of monetary authorities explored every avenue to tame the exchange rate volatility (Were and Tiriongo, 2012).

**Figure 1.4: A graph showing the trend for Money Supply from 2000 to 2014.**

Source: Researcher’s analysis based on data from Central Bank monthly statistical bulletins.
The trend for money supply in figure 1.4 depicts continuous increase in money supply from the year 2000 to 2014. But in 2013 it was even higher as it surpassed Kshs 2 trillion the highest ever.

**Figure 1.5: A graph showing the trend of 91-Day Treasury bill from 2000 to 2014.**

Source: Researcher’s analysis based on data from Central Bank monthly statistical bulletins.

Figure 1.5 shows that 91-Day Treasury bill rate has been fluctuating over years. From 2000 the 91-Day Treasury bill declined from the year 2000 until 2003 when it increased for a short period. From 2004 the rate maintained between 5-10% until 2009. It declined again to 2010 before it increased tremendously in 2011 when the rates were attractive to investors as the Kenyan government sold the Treasury bills at a higher rate to control money circulation caused by too much remittance into the country as a result of currency depreciation. It later declined when the currency menace was under control.

The above macroeconomic variables show that the relationship between stock market performance and the variables is close as global financial markets become liberalized. These variables are important in determining stock market performance as they reflect state of the
macro economy which an investor has to monitor before making any choice to invest (Junkin, 2012). The economic situation is reflected by the variations in the macroeconomic variables and other activities of the government like general elections.

1.1.6 The Development of the Nairobi Securities Exchange

The history of Nairobi Securities Exchange can be traced back to 1920’s when trading of shares began. At the time, transactions were conducted in an informal way with no rules to govern the trading activities (Kemboi and Tarus, 2012). It was in 1954 when the NSE was constituted as a voluntary association of stock brokers registered under Societies Act (NSE, 2013).

On February 18, 1994 the NSE 20-Share Index recorded an all-record a high of 5030 points and the NSE was rated as the best performing market in the world with a return of 179% in dollar terms by the International Finance Corporation (IFC). On 11th September, 2006 live trading on the automated trading systems of the Nairobi Stock Exchange was implemented (NSE, 2013).

In July 2007, NSE reviewed the NSE 20-Share Index and announced the companies that would constitute the NSE Share Index. The review of the NSE 20-share index was aimed at ensuring it is a true measure of the market return. In 2008, the NSE All Share Index (NASI) was introduced as an alternative index. Its measure is an overall indicator of the stock market performance. The Index constitutes all the traded shares of the day. Its attention being on the overall market capitalization rather than the price movements of select counters (NSE, 2013).
In December 2009, NSE uploaded all government bonds on the Automated Trading System (ATS). In July 2011, the Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited. The alteration of the name reflected a strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments. In September 2011, the Nairobi Securities Exchange converted from a company limited by guarantee to a company limited by shares and adopted a new Memorandum and Articles of Association reflecting the change (NSE, 2013).

On 27th June, 2014 the Capital Markets Authority approved the listing of the NSE through IPO and self-list its shares on the main investment market segment. On July 24th, 2014 the IPO was set open and had run up to August 12, 2014. The listing made NSE join Johannesburg Stock Exchange in Africa that are self-listed (NSE, 2014).

1.1.7 Performance of Nairobi Securities Exchange

Kenya’s stock returns against other frontier markets in Africa were higher in the year 2013 using NSE-20 Share Index which is the main parameter used to track investor gains at the Nairobi Securities Exchange (NSE, 2013).

NSE in the year 2013 closed as the best performing securities markets in Africa and fourth in the world according to the MSCI index which was 1661.069 as at December, 2013 as compared to 1338.500 in December, 2012 showing a tremendous increase in performance of NSE as compared with other frontier stock markets all over the world. But in 2008 the MSCI was low as a result of US financial meltdown which affected the financial system and other financial markets (MSCI index, 2014).
Table 1.2 shows various key equity performance indicators in NSE from the year 2000 to 2014 as reported by the Capital Markets Authority. It shows various trends for the indicators.

Table 1.2 Key equity performance indicators annual data from 2000 to 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover (Kshs Billion)</th>
<th>Shares Volume (Million)</th>
<th>Average 20 Share Index</th>
<th>Average NSE Market Capitalization (Kshs Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>9.98</td>
<td>149.25</td>
<td>2003.00</td>
<td>104.50</td>
</tr>
<tr>
<td>2001</td>
<td>9.46</td>
<td>126.64</td>
<td>1675.00</td>
<td>98.40</td>
</tr>
<tr>
<td>2002</td>
<td>35.23</td>
<td>106.07</td>
<td>1087.00</td>
<td>83.30</td>
</tr>
<tr>
<td>2003</td>
<td>43.82</td>
<td>198.10</td>
<td>1935.00</td>
<td>180.65</td>
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<tr>
<td>2004</td>
<td>68.72</td>
<td>525.88</td>
<td>2640.00</td>
<td>274.41</td>
</tr>
<tr>
<td>2005</td>
<td>36.33</td>
<td>579.94</td>
<td>3972.00</td>
<td>420.70</td>
</tr>
<tr>
<td>2006</td>
<td>94.90</td>
<td>1454.70</td>
<td>5646.00</td>
<td>791.60</td>
</tr>
<tr>
<td>2007</td>
<td>88.60</td>
<td>1938.20</td>
<td>5445.00</td>
<td>851.10</td>
</tr>
<tr>
<td>2008</td>
<td>97.50</td>
<td>5856.50</td>
<td>3521.00</td>
<td>853.70</td>
</tr>
<tr>
<td>2009</td>
<td>38.20</td>
<td>3169.10</td>
<td>3247.00</td>
<td>834.20</td>
</tr>
<tr>
<td>2010</td>
<td>103.50</td>
<td>6479.80</td>
<td>4257.00</td>
<td>1089.20</td>
</tr>
<tr>
<td>2011</td>
<td>78.10</td>
<td>5684.70</td>
<td>3751.00</td>
<td>1035.80</td>
</tr>
<tr>
<td>2012</td>
<td>86.80</td>
<td>5464.20</td>
<td>3736.00</td>
<td>1072.90</td>
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<tr>
<td>2013</td>
<td>155.75</td>
<td>7576.20</td>
<td>4784.00</td>
<td>1691.50</td>
</tr>
<tr>
<td>2014</td>
<td>215.70</td>
<td>8233.40</td>
<td>5017.00</td>
<td>2142.40</td>
</tr>
</tbody>
</table>


Table 1.2 shows mixed performance of the indicators for various years. For instance, in 2006 NSE 20 Share index was high and started declining as it was approaching in 2007, the situation worsened in 2008 because of the global financial crisis and scandals of stock brokerage firms (Mwega, 2010) and also post-election violence following disputed election of December 2007 (Koech and Rotich, 2013). The trend continued to 2009 because of political unrest in the country which scared investors in securities not to invest because of
unfavourable environment (Koech and Rotich, 2013). The global financial crisis affected macroeconomic prices i.e. stock prices, interest rates and exchange rates thus affecting real economy (Were and Tiriongo, 2012). The table also shows that from 2011 to 2014 the performance in almost all indicators has shown a positive trend implying that the environment has been conducive to soothe investors into the stock markets.

1.2 Statement of the problem

Stock market plays an important role in economic development of a country. It can contribute to economic development through boosting savings (Junkin, 2012). In addition stock market creates an environment conducive for business transactions. Volatile market makes investors lose confidence and fear investing in stock market. This consequently impacts negatively the economy.

Many studies have been done based on developed markets evaluating stock returns, volatility and macroeconomic variables (Alshogeathri, 2011). Thus, policy makers wish to establish which variables to keep check in order to create an environment conducive for investment in stock markets. Therefore an in-depth relationship need be established between political events and stock market performance as well as macroeconomic variables and stock market performance.

Various political events are known to significantly influence stock market. Some researchers have identified elections as the only political event but in this study we have explored more political events in Kenya which is a major variable in determining stock market performance. This study gives a different dimension on how the political event is measured to provide empirical evidence on its effect on stock market performance. Political events being an
influential factor in asset pricing, investors and researchers have developed keen interest to understand its actual impact to enable in making policy changes that can favour the stock market so that they do not affect its performance.

Various studies show the effect of macroeconomic variables on returns is present but not significant therefore this study will try to look into the significance of each macroeconomic variable. There is lack of consensus of the effect of macroeconomic factors on stock market performance. For instance, Garcia and Liu (1999) established that macroeconomic volatility does not affect stock market performance. Maku and Atanda (2010) studied Nigeria stock exchange and established that macroeconomic factors affect stock market performance. Therefore, since elections and other political uncertainties do matter for the stock markets, politics can shape economic outcomes, affect asset prices, and change financial risk. This study will therefore explore extensively the effect of political instabilities and macroeconomic variables on the performance of the stock market and the general performance of the economy.

1.3 Research Questions

i. What is the effect of political events on the performance of NSE?

ii. What is the effect of selected macroeconomic factors on the performance of NSE?

1.4 Objectives

1.4.1 General objective

The general objective of the study is to determine the effects of political events and macroeconomic factors on the performance of NSE in Kenya.
1.4.2 Specific objectives

i. To determine the effect of political events on the performance of NSE.

ii. To determine the effect of macroeconomic factors on the performance of NSE.

iii. To make policy recommendations based on the findings of (i) and (ii) above.

1.5 Hypothesis

The hypotheses on which the study is based are:

$H_0$: Political events do not have impact on the performance of NSE.

$H_1$: Political events have impact on the performance of NSE.

$H_0$: Macroeconomic factors do not have impact on the performance of NSE.

$H_1$: Macroeconomic factors do have impact on the performance of NSE.

1.6 Justification of the study

This study provides a background which can be used as a basis by investors to make informed choices on where and how to invest. The study is essential to both private and public institutions that thrive to improve efficiency and stability of stock markets. In Kenya macroeconomic factors and political events determine performance of securities exchange market. Investors need to take these factors into account in order to make wise decisions in trading to avoid situations of not getting what they expect. Therefore this paper provides adequate information on these macroeconomic factors and political events and how it influences investor’s decision.

In order to determine right investment strategy; investment managers, institutional investors and other individual investors, need to be able to recognize the potential risks which may arise from the market anomalies and imperfections. Many investment managers on many
occasions provide security investment advice to their clients based on simple and casual observations from market trends. This study provides the insights into what investment managers should look for in a market which is mixed with political influences when providing guidance to their clients in constructing optimal portfolios. Scholars and researchers will find this study important if they want to use the findings as a basis for current and further research.
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section presents both theoretical and empirical literature reviews by other scholars based on general and specific objectives of our study.

2.2 Theoretical literature review

2.2.1 Modern Portfolio Theory

Modern Portfolio Theory (MPT) was proposed by Markowitz (1952) to enable investors evaluate their expected returns based on the predisposed risks. This theory suggests maximization of an investor’s portfolio of expected return for a given amount of portfolio risk and risk minimization for a given level of expected return. Markowitz therefore encourages diversification of assets to avoid market risks as well as risks that are unique to a specific company. This enables in controlling both the kind and the amount of expected risk and return.

MPT emphasizes determination of the statistical relationships among the specific individual securities that comprise the overall portfolio rather than analyzing the characteristics of individual investments (Omisore et al., 2012). However, they further suggest that it is important to consider how each asset changes in price relative to how every other asset in the portfolio changes in price considering other internal or external factors.

Markowitz claims that investment portfolio is an important concept leading to applicability of the theory to this study. This is because it shows how investors approach varied risks due to perceived better returns from their investment decisions, even when there is no outright
feasible return on investing in particular securities. Therefore, macroeconomic conditions in addition to known market risks need to be evaluated to avoid making rational decisions based on market behaviour.

2.2.2 McKinnon and Shaw theory

McKinnon (1973) and Shaw (1973) argued that to raise demand for investment there is need to keep real interest rates below market equilibrium. Low rates of interest raises the profitability of investment projects by raising the net present value of future earnings from the investment. This theory is based on the assumptions:
(i) Investment is a decreasing function of real interest rate of a loan and an increasing function of the rate of growth.
(ii) Saving is an increasing function to both real growth rate and deposit rate of interest.

Capital accumulation is discouraged because of the fact that high inflation and interest rates are set too low thus minimal capital accumulation. Limited financing from banks makes individuals to finance investment projects themselves.

2.2.3 Capital Asset Pricing Model (CAPM)

William Sharp came up with this model in 1964. This theory is a framework for determining the expected return for risky assets. It emphasizes on the relationship between expected return and risky securities (Sharpe, 1964).

Many experts working in areas of financial transactions have got problems as they try to predict microeconomic theory to deal with any conditions concerning risks, (Sharpe, 1964).
An investor can attain any point along the capital market line since capital asset prices adjust.

The market gives provisions for price of time and price of risk, (Sharpe, 1964).

**Figure 2.1: A graph of Market Risk against Expected Market Return**

![](attachment:image.png)

Source: Sharpe, 1964

CAPM can be calculated as follows:

\[ R_{er} = R_{rf} + \beta(R_{rs} - R_{rf}) \]

Where, \( R_{er} \) = expected return, \( R_{rf} \) = risk-free return, \( R_{rs} \) = average return on all securities and \( \beta \) = systematic risk factor

The idea behind this model is that investors should be compensated through risk and time value of money. The theory has the following limitations: the market is perfect, there are no transaction costs, participants have homogeneous expectations from their investment and individuals are risk averse (Perold, 2004). Thus the theory has been criticized by scholars on these grounds of unrealistic assumptions which cannot be relied and its difficultness to test its validity.
2.2.4 Arbitrage Pricing Theory (APT)

Ross developed this theory in 1976. It bases its idea on asset returns by looking at the relationship between that particular asset and risk factors (Ross, 1976). CAPM has been criticized by behavioural financial scholars because of its unrealistic assumptions mentioned above. But according to Ross (1976), APT has the ability of predicting the relationship between returns of a portfolio and a single asset. This is done through a linear combination of the explanatory macroeconomic factors. It means that the relationship can be established between the same asset and riskier factors.

Various studies have been done examining the stock market and other macroeconomic factors using this theory. Fama (1981) and Fama and French (1996) considered APT validity and confirmed that share returns are causally related to macroeconomic factors, although APT can be modeled in establishing the short-run relationship between macroeconomic factors and the prices of stocks where stationarity assumption is taken for the first differences. In this study, we shall adopt the model to establish not only aggregate but also dynamic adjustments between both macroeconomic and political factors with respect to the main stock market index.

2.2.5 Market Efficiency theory

Fama developed this theory in the year 1970. It suggests that a market is rational and current market prices reflect fully available information on security and expected return at that price. There are three forms of market efficiency: weak form, semi-strong form and strong form.
Weak form efficiency contends that current stocks prices reflect fully all historical market information like rate of return and trading volume. Therefore one may not gain a lot from using any trading principle to decide whether to buy or sell securities.

Semi-strong states that stocks prices reflect fully all public information that includes; earnings forecast, dividends, stock splits, news about the economy and political news. Therefore investors cannot make superior profits from their transactions because security prices already reflect all available public information.

Strong form efficiency states that market prices reflect fully all available information from both public and private sources. Investors cannot beat the market as prices are fair. This form of efficiency assumes that markets are perfect (information is cost free and available to everyone at anytime) in which prices adjust rapidly to the relay of new information.

2.3 Empirical Literature

A study carried out by Robbani and Anantharaman in 2002 on the influence of political events on some stock market indices and found out that political events have long-term effect on stock prices. The sample was selected from Pakistan, Sri Lanka, Indonesia and India because political uncertainties were common in these countries. Daily data for four years was collected. Political events were considered as independent variable and represented by a dummy variable regression coefficient. The t-test results showed that political events have long term effect on the share prices.

Fowdar and Koonjal (2008) conducted a study in Mauritius to determine whether political events affect returns of the stock exchange. They conducted regression analysis and
concluded that political events affect stock exchange. Since political events can influence performance in stock market, foreign investors use political risk to evaluate the performance of the stock market.

A study was carried out by Nguthi (2013) to establish the effect of political news on companies listed at the NSE on stock market returns in Kenya of the March 2013 general elections. The study comprised of 60 trading days before and 60 after the day of election. The study sampled 19 counters and found out that out that 17 out of the 19 abnormal returns were not statistically significant employed market model to estimate expected returns. The study found that stock prices react to political news. Stock prices recorded increase in prices before the event date and after signifying investor confidence in the incoming government. The findings implicated that investors should take precautions when purchasing stocks during periods of political uncertainty.

A similar study was done by Menge et. al (2014) where they were investigating the effects of elections on stock market returns. They used data from NSE on 56 companies that covered the period before and after elections of December 2002, December 2007 and March 2013. The study findings indicated that after elections returns were higher as compared to before elections. They recommended that investors should buy stocks after elections and sell them before elections when returns are high. As well the government should try to maintain stability after elections to avoid stock return drops.

Adam and Tweneboah (2008) used Vector Error Correlation model (VECM) and Cointegration for data of 17 years i.e. from 1991 to 2007 but on quarterly basis to examine the impact of macroeconomic variables on stock prices in Ghana. They were examining long-
run and short-run relationships on stock prices in Ghana. The results indicated a long-run relationship between macroeconomic variables and stock prices. The VECM showed that inflation and interest rate lagged have significant influence on stock market.

According to Attari and Safdar (2013) in Pakistan did a similar study in examining macroeconomic variables and stock market prices by applying Exponential GARCH. They used monthly data from December 1991 to August 2012 to explore time series analysis of They used also ADF and ARCH to check for stationarity and homoscedasticity. The result showed that macroeconomic variables have a credible influence on the prices of stocks. They as well concluded that stock market in Pakistan was highly volatile.

Patel (2012) using monthly data from January 1991 to December 2011 studied the effects of macroeconomic determinants on the Indian Stock market performance. He took into account two stock market indices: Sensex and CNX Nifty. He also used eight macroeconomic variables: inflation, exchange rate, index of industrial production (IIP), interest rate, money supply, Gold price, Silver price and Oil price. By applying ADF, Johansen cointegration test and VECM the study found that interest rate is I(0); Sensex, Nifty, exchange rate, IIP, Gold price, Silver price and Oil price are I(1) and inflation and money supply is I(2). The study as well found that there exist long run relationship between macroeconomic variables and stock market indices.

A similar study had been done earlier in Nigeria by Maku and Atanda in 2010 using Augmented Dickey Fuller (ADF) and unit root examined the long-run macroeconomic determinants of stock market performance in Nigeria between the periods of 1984 and 2007. The results showed that Nigeria Stock Exchange is more responsive to changes in exchange
rate, real output, inflation rate and money supply. The variables were found to have a significant impact on Nigerian capital market performance in the long-run. They therefore, recommended that investors to pay attention to the above factors rather than Treasury bill rate in their investment decision.

Qundir (2012) using Autoregressive Integrated Moving Average (ARIMA) model investigated the effect of macroeconomic variables on interest rate and industrial production on Dhaka stock exchange stock returns between January 2000 and February 2007. He found that a positive relationship exists between interest rate and industrial production with stock market returns but the coefficients did not show a significant relationship statistically.

Olweny and Omondi (2011) put forward evidence which shows that interest rate, exchange rate and inflation rate have a significant effect on stock return volatility. In undertaking the study to establish how macroeconomic factors affect stock market performance, they made a collective assumption that the effects are the same in all the firms in the same way. They, however, failed to note that the nature and the extent of such contribution to performance differ from one company to another. The volatility of exchange rate, GDP, interest rate and inflation rates, according to Ongore and Kusa (2013), requires further exploration in determining their effects. These researchers investigated specific bank factors which affect commercial banks performance in Kenya.

A multivariate regression was run using inflation rates, exchange rates, oil prices, price of goods, money supply, real wage, imports, regional stock market indices, budget deficits, interest rates trade sector, real activity and political risks, unemployment rates and domestic consumption by Menike (2006) in investigating the effect of macroeconomic variables on
stock prices in Sri Lankan stock market and used data covering 11 years from September 1991 to December 2002. He found that the null hypothesis that the macroeconomic variables do not have any impact on equity prices is rejected at 5% level of significance.

Nyang’oro (2013) using a case of Nairobi Securities Exchange investigated foreign portfolio flows and stock market performance in Kenya. He argued that uncertainty in the market can be created by a volatile market and increases in changes in exchange rate whereas high foreign Treasury bill rate lessens the risk levels in foreign markets making them more attractive than before. Therefore, he concludes that these variables have a negative correlation to return. Global financial market volatility can as well affect the realization of benefits from capital flows. As well, the international exchange rate volatility may lead to large and unfavourable swings in capital flows.

Osoro and Ogeto (2013) studied the NSE market in order to understand the effects of macroeconomic fluctuations on the financial performance of listed Manufacturing firms in Kenya. They applied a multivariate regression model in determining the relationship and significance of all factors which were considered with respect to the profit gained by the sector. The study found out that a 1% increase in exchange rate leads to 11.9% decrease in the profits gained by this sector. They also claimed that interest rate, foreign exchange and inflation rate have significant effects on firms in the manufacturing sectors in terms of performance. On the Agricultural sector, the influence of the same macroeconomic factors is found to be insignificant.

A monthly data from March 2008 to March 2012 summing up to 48 observations was used by Oriwo and Ochieng’ (2012) in investigating the impact of macroeconomic variables on NSE
All Share Index (NASI) and further examining whether the variations in macroeconomic variables can be used to predict future NASI. They took three variables into account i.e. lending interest rates, inflation rates and 91-Day Treasury bill rate. They did regressions and decided to drop lending interest rates as it was correlated with 91-Day Treasury bill interest rate. They found that a negative relationship between the 91-Day Treasury bill interest rate and NASI. They concluded that changes in macroeconomic variables have an effect on stock market performance which as well has influence on foreign investor’s decisions.

2.4 Overview of the literature

Some studies that examined the effect of macroeconomic determinants in relation to stock market performance especially on the developed stock markets (Patel, 2012). However few studies have been undertaken to capture these effects in Kenyan stock market where political regime plays key role in determining the financial systems. Kenyan stock market is still developing with technology and information asymmetry thus affecting efficiency of the stock market. Thus, considering the likely effect of such flows in an economy is important.

A comprehensive literature investigating macroeconomic instability and major political uncertainties both local and international in relation to market performance is scarce and inconclusive. This study will contribute to the literature focussing on improving investor confidence by reducing uncertainty contributed by political events, not only the general elections of a country as suggested by Menge et al. (2014) but even the events that are associated with them and those mainly drive stock market growth. Provided the liberalisation of the stock market, it is necessary to be cognisant of the implications of the same on, not only the stock market performance but the behaviour of the investors. Bachtel and Fuss
(2006) studied partisan politics and stock market performance where they looked at the effect of expected government partisanship on stock returns in the 2002 German federal election.

From the literature reviewed above, it was evident that limited research has been done on the effect of political uncertainties on stock market performance at Nairobi Securities Exchange. This study therefore sought to fill this research gap.
CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter describes the methods that have been used to operationalize the study, collect data and analyse. The specific areas included are: data source and data analysis.

3.2 Theoretical Framework

NSE performance can be computed from the regression coefficient between stock returns and macroeconomic factors (Adler and Dumas, 1983). To establish the effect of macroeconomic factors in stock markets, the Arbitrage pricing theory (APT) is used. This is because APT enables specification of returns as a linear function of various factors and it is less restrictive compared to CAPM. APT model was developed by Ross (1976). It specifies a linear relationship between expected returns and some market-wide or industry-wide factors. It assumes that the return on a security consists of expected and unexpected part.

\[ R = ER + UR \]  \hspace{1cm} (1)

Where \( R \) is the actual return on a security,
\( ER \) is the expected return on a security and
\( UR \) is the unexpected return on security

The unexpected return can be subdivided into systematic (\( p \)) and unsystematic risk (\( q \)).

\[ R = E t + p + q \]  \hspace{1cm} (2)

The systematic risk is the one that affects the whole market, also known as the market risk, and is captured by the factors like inflation and exchange rates etc. Thus, \( p \) can be replaced by a factor \( H \).

\[ R = ER + \beta H + q \]  \hspace{1cm} (3)
Equation 3 is the factor or market model and $\beta$ measures the sensitivity of stock returns to changes in the factor. The model can also include many factors to be known as the multifactor model as shown in equation 4

$$R_i = ER_i + \sum_{i=1}^{k} \beta_i H_i + q_i$$

(4)

According to APT if securities satisfy a linear factor structure, their expected returns must also satisfy the same factor structure.

$$ER_i = R_f + \sum_{i=1}^{k} \lambda_i \beta_i$$

(5)

Where $R_f$ is the risk-free rate, $\lambda_i$ is the excess return ($R_m - R_f$) where $R_m$ is the market return and $\beta_i$ is the measure of risk.

In APT, the return of a portfolio consists of the weighted average of expected returns, betas multiplied by the factors and the unsystematic risk.

$$AR_p = \sum_{i=1}^{k} w_i ER_i + (\sum_{i=1}^{k} w_i \hat{a}_i)H_i + \sum_{i=1}^{k} w_i q_i$$

(6)

If a portfolio is well diversified, there is no unsystematic risk for individual security because this risk has already been diversified away. Thus, the return on market portfolio can be expressed as:-

$$AR_p = ER_p + \hat{a}_p H + q_p$$

(7)

Where $\beta_p$ is the weighted average of all $\beta$’s and $q_p$ is the portfolio’s unsystematic risk which is uncorrelated with the factors (H). APT assumes that expected return follow a factor model as actual returns. Therefore, the expected return of portfolio follows a model similar to equation (5). Since this study focuses on the whole market as the portfolio, the return on stock market as measured by the market index is generated by the following multifactor model.
\[ AR_p = \hat{a}_{p0} + \hat{a}_{p1} H_1 + \hat{a}_{p2} H_2 + \cdots + \hat{a}_{pk} H_k + q_p \]  \hspace{1cm} (8)

In APT model changes in macroeconomic factors are included as they affect performance in NSE. Thus stock return (Rs) can be expressed as a linear factor model as shown by equation 9.

\[ Rs = \hat{a}_0 + \sum_{i=1}^{H} \hat{a}_i H_i + \varepsilon_i \]  \hspace{1cm} (9)

Where Rs is the stock return, \( \delta_i \)'s measures the sensitivities to the factors and \( H_i \) are factors that affect NSE and \( \varepsilon_i \) is the disturbance term.

However, APT does not specify the factors to be included in the model; it depends on the researcher’s discretion (Straumann and Giridi, 2007). There are two major approaches used in selecting factors- the statistical and theoretical approach. The statistical approach consists of factor analysis and principal components method. Theoretical approach involves specifying financial market and macroeconomic variables that can capture the systematic risk and firm characteristics that can explain sensitivity to systematic risk. This study used theoretical approach to select factors since it is focusing on factors that affect performance of the stock market and also the factors included are based on stock market performance literature.

3.3 Model Specification

Multivariate regression was employed in this study combines all the independent variables and detects the effect of those variables on our dependent variable stock returns (in our case NSE 20 share index, used as a proxy of the NSE performance). We shall extend the model in equation 9 above to estimate the macroeconomic volatility and political factors on stock market performance as follows;
Rs = $\beta_0 + \beta_1 \text{INF} + \beta_2 \text{EXC} + \beta_3 \ln\text{MS} + \beta_4 \text{TB} + \beta_5 \text{DPOL} + \varepsilon_i$ \hspace{1cm} (10)

Where; Rs = Stock returns based on NSE 20 share index which has been used as an indicator for the NSE performance

$\beta_0$ = intercept coefficient.

INF = inflation rates.

EXC = exchange rates.

TB = 91-Day Treasury bill.

MS = money supply.

DPOL = Dummy indicating major political events.

$\beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5$ = regression coefficients

$\varepsilon_i$ = error term (extraneous variables)

The respective OLS assumptions will be verified through conducting various tests to ensure that the estimated model has Best, Linear, Unbiased Estimates (BLUE) characteristics before it is subjected to interpretations.

### 3.4 Variable description

**Stock returns:** Logarithmic difference of stock market price index. It is the dependent variable. In this paper we used NSE 20 share index as a proxy of stock market performance. (NSE 20-share index is constructed out of the 20 best performing and largest firms listed on the Nairobi Securities Exchange. Therefore, we expect that any decision to invest in the market will most likely be based on performance of these firms as reflected by the index (Nyang’oro, 2013). It is measured as points, but we have used this formula to find the returns.

$$\log \left( \frac{P_t}{P_t - 1} \right)$$
**Inflation rate:** This is the change in general price level in an economy over some period of time. The monthly inflation rate calculated as the baseline for the consumer price index. It is a macroeconomic variable as well. It erodes real value for money. Increases in inflation increase the cost of living thus channelling scarce resources meant for investment to consumption. This decreases demand for investment and stocks. Commodity prices increase due to inflation and ultimately pushing of share prices downwards by investors. We expect it to have a negative impact on the performance in NSE (Nyang’oro, 2013).

**Exchange rate:** This is the value of a foreign country’s currency expressed in terms of the home country’s currency. It is the price at which currency of one country can be converted to another country’s currency. In this study we use the Kenyan shillings expressed in terms of the US Dollar (i.e. Kshs-Dollar exchange rate). Some exchange rates fluctuate from day to day as others are fixed. We expect it to have a negative impact on the performance (Osoro and Ogeto, 2013).

**91-Day Treasury bill:** This is a short term debt obligation with a maturity of three months. It is issued by a national government for regulating money supply. It is regarded as risk free rate of return in the market. It is expected to have a positive effect on the performance in NSE (Oriwo and Ochieng, 2012).

**Political event:** This is a period of too much political activity at a specific time. In this paper we have identified major political events that we expect to affect the behaviour of investors both local and foreign. Some of these events include: the general elections 2002, 2007 and 2013, the post-election violence of 2007/2008 and referendums like the one of August 2010. We have ignored minor political utterances. For any political event we have coded with 1 for
3 months before and 3 months after and 0 otherwise. It’s a dummy variable. We expect it to have a positive/negative effect on the performance in NSE (Menge et al., 2014).

**Money supply**: M2 is used to represent money supply. This is the amount of money in circulation in an economy at a specific time. It involves minted coins and printed notes, money in deposit accounts and in the liquid assets. We expect it to have a significant and positive impact on performance of NSE (Ogiji, 2013).

### 3.5 Diagnostic Tests

The OLS method makes various assumptions: normal distribution of the random error term, constant variance of error terms across observations, linearity, no serial autocorrelation of the error terms, no perfect correlation between any pair of independent variables and stationarity. Therefore, diagnostic tests are undertaken so as to validate the estimates that OLS yields.

#### 3.5.1 Heteroscedasticity

Presence of heteroscedasticity affects the minimum variance which later leads to invalid conclusions when testing hypothesis. The residual plot method is used to test for it. If the plots exhibit a systematic pattern, it implies that heteroscedasticity is present. As a remedy, robust standard errors are used. If the source of heteroscedasticity is unknown, the study has carried out Breusch-Pagan test to check its presence (Mukras, 1993).

#### 3.5.2 Autocorrelation

Autocorrelation occurs mostly in time series data. We may as well expect it in our time series data. This refers to the correlation between random error terms of the subsequent time periods. If present, the bias leads to spurious estimates. The use of robust standard errors also
serves as a remedy for autocorrelation. The study has used Breusch-Godfrey test to check its presence (Mukras, 1993).

### 3.5.3 Multicollinearity

Multicollinearity is also common in time series data. This is because variables may be following a particular trend. The variables may be increasing or decreasing over time. Multicollinearity makes the coefficient of regression to be indeterminate and standard errors become infinite. Multicollinearity may be common among variables, what matters is the degree. To check for the presence of multicollinearity, we have used Variance Inflation Factor (VIF) test which measures how much variance of an estimated coefficient increases due to collinearity (Nachtscheim, et. al, 2004). For VIF values greater than 10 and 1/VIF values less than 0.10, will imply that Multicollinearity is present. If multicollinearity is found to be present, we shall either drop one of the variables which is correlated or retain if the variable not highly correlated as a remedy (Mukras, 1993).

\[
VIF = \frac{1}{1 - R^2}
\]

Where VIF= variance inflation factor

\[ R^2 = \text{coefficient of determination} \]

\[ 1/VIF = \text{tolerance} \]

### 3.5.4 Normality assumption of the error term

Normally distributed error term with zero mean and a constant variance is a vital classical linear regression. The error term is used to capture all other variables that influence dependent variable but are not included in the model. It is however, believed that the omitted variables have a small influence and at best random. For OLS to be applied, we must satisfy
the assumptions of normality of the error term (Mukras, 1993). Since OLS estimators are linear functions of the error term, and then it means they will also be normally distributed. To confirm whether the error term is normal or not, the study will employ Skewness-Kurtosis test. If error term not normally distributed, adopt a generalised linear model in that case.

3.5.5 Stationarity Test

A stationary series is preferred because we can study its behaviour at the specified time and be able to generalize for other time periods. With non-stationary series, we can only study its behaviour at the given time period but we cannot make a general statement. Unit root tests i.e. Augmented Dickey Fuller Test will be used to detect non stationarity in all the variables. If variables are non-stationary, there is a tendency of the estimates to change over time. This characteristic leads to spurious estimates. Therefore, if variables are found to be non-stationary, differencing is applied to make sure they are integrated of same order. The null hypothesis in this case is that the variable under consideration is non-stationary (Gujarati, 2004).

According to Ndung’u et al., (2012) the time series $y_t$ as defined in $Pa(B) y_t = D(C)R_t$ can have a unit root if $Pa(1) = 0, D(1)$ is not equal to zero.
Dickey Fuller is based on the following estimate;

\[ y_t = \beta y_{t-1} + \mu_t \quad \text{or} \quad \Delta y_t = (\beta - 1)y_{t-1} + \mu_t \]

it then tests for

\[ H_0: \beta = 1 \ (\equiv \beta - 1) = 0 \quad \text{against} \quad H_1: \beta < 1 \ (\equiv \beta - 1) < 0 \]

Augmented Dickey Fuller (ADF) augments the formulation by adding lagged levels of the change in the dependent variable to produce a better white-noise error term. It can be given by:

\[ \Delta y_t = \beta y_{t-1} + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \ldots + \beta_p \Delta y_{t-p} + \mu_t \]

ADF includes higher order lagged terms to account for data generating process. This is a parametric approach. A variable needs to be differenced \( d \) times to be stationary i.e. I(\( d \)) series.

3.6 Data sources

We have used secondary time series data in realizing the objectives of this study. The data has been obtained from central bank monthly bulletin and capital markets authority quarterly bulletin. We have considered monthly data from January 2000 to December 2014 making up of 180 observations.
CHAPTER FOUR: DATA ANALYSIS AND EMPIRICAL RESULTS

4.1 Introduction

The focus of this chapter is on the analysis of the data and presentation of empirical results of the model discussed in chapter 3. It starts with descriptive statistics and to the last part of the chapter it presents empirical findings and a report of the model estimated.

4.2 Descriptive statistics

Table 4.1: Summary Statistics

<table>
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<th>NSE</th>
<th>INF</th>
<th>EXC</th>
<th>MS</th>
<th>TB</th>
<th>DPOL</th>
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<td>6.6676</td>
<td>483126</td>
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<td>1.8978</td>
<td>2.8572</td>
<td>3.4305</td>
<td>2.5072</td>
<td>4.2728</td>
<td>1.925</td>
</tr>
</tbody>
</table>

Where; Stock return, INF = inflation rates, EXC = exchange rates, TB = 91-Day Treasury bill, MS = money supply, DPOL = Dummy indicating major political events.

The total number of observations considered in this study was 180. NSE 20 share index deviates from its mean (3489.96) by 1308.2 but ranging between 1043.4 and 5774.3. Inflation deviates from its mean (7.9916) by 4.8295 but ranging between 0.2 and 19.72. Exchange rate deviates from its mean (78.447) by 6.6676 but ranging between 61.889 and 101.27. In general, the standard deviation for each variable indicates the value by which a given variable deviates from its mean. Standard deviation for the dummy variable for major political events has no meaning in this case since the dummy is either 0 or 1.
Stock return is almost normally negatively skewed -0.2607 and is highly peaked 1.8978. Inflation is positively skewed and almost flat i.e. 0.9356 and this applies to exchange rate. Money supply and 91-day Treasury bill are highly peaked. Exchange rate, money supply and 91-day Treasury bill are positively skewed. 91-day Treasury bill is normally skewed.

### 4.3 Stationarity

Unit root tests are used to detect non-stationarity in all the variables. If variables are non-stationary, there is a tendency of the estimates to change over time. This characteristic leads to spurious estimates. Therefore, if variables are found to be non-stationary, successful differencing is applied until the bias is eliminated. The null hypothesis in this case is that the variable under consideration is non-stationary.

**Table 4.2: Test for stationarity**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test statistic</th>
<th>Critical value at 1%</th>
<th>Critical value at 5%</th>
<th>Critical value at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock return</td>
<td>-1.744</td>
<td>-3.484</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>INF</td>
<td>-3.551</td>
<td>-3.484</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>EXC</td>
<td>-1.389</td>
<td>-3.525</td>
<td>-2.899</td>
<td>-2.584</td>
</tr>
<tr>
<td>lnMS</td>
<td>-0.7984</td>
<td>-3.484</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>TB</td>
<td>-2.444</td>
<td>-3.484</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
</tbody>
</table>

From table 4.2 all other variables are non-stationary in their native forms except inflation.

**Table 4.3: Results after first differencing**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Test statistic</th>
<th>Critical value at 1%</th>
<th>Critical value at 5%</th>
<th>Critical value at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock return</td>
<td>-5.723</td>
<td>-3.484</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>dEXC</td>
<td>-6.726</td>
<td>-3.485</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>dlnMS</td>
<td>-6.610</td>
<td>-3.485</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
<tr>
<td>dTB</td>
<td>-5.780</td>
<td>-3.485</td>
<td>-2.885</td>
<td>-2.575</td>
</tr>
</tbody>
</table>
From the results in table 4.3, all the variables are non-stationary in their native forms but they become stationary after first differencing. Inflation becomes stationary at 5% and 10% significance level since absolute value of t-statistic is greater than critical value but not at 1%. For exchange rate, money supply and 91-Day Treasury bill are stationary at 1%, 5% and 10% significance levels as t-statistic is greater than t-critical.

4.4 Correlation Matrix

Correlation of the variables is examined in the table shown below.

Table 4.4: Correlation matrix using spearman at 5%

<table>
<thead>
<tr>
<th>Variables</th>
<th>NSE</th>
<th>INF</th>
<th>EXC</th>
<th>lnMS</th>
<th>TB</th>
<th>DPOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSE</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td>0.0376</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXC</td>
<td>-0.0467</td>
<td>0.0985</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnMS</td>
<td>0.7151*</td>
<td>0.1695*</td>
<td>0.5076*</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td>-0.2379*</td>
<td>0.0652</td>
<td>0.3149*</td>
<td>-0.0452</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>DPOL</td>
<td>0.1579*</td>
<td>-0.1737*</td>
<td>-0.0885</td>
<td>0.0985</td>
<td>-0.0486</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

From Table 4.4, we observe the relationship existing between various variables used by this study. There is a very strong positive relationship between NSE 20 share index and money supply and political event. 91 Day Treasury bill has a strong negative relationship with NSE 20 share index. Inflation and exchange rate show a positive and negative relationship respectively with NSE 20 share index. Inflation has a positive association with exchange rate and 91 Day Treasury bill while money supply and the dummy for political events exhibit strong positive and negative relationship respectively. Exchange rate has a strong positive relationship with money supply and 91 Day Treasury bill. Dummy variable for political event has a negative relationship with exchange rate. 91 Day Treasury bill has a negative correlation with political events. Money supply shows a negative relationship with TB and a
positive relationship with political event and finally 91 Day Treasury bill has a negative relationship with dummy for political event. Having explored these varied relationships, it should be however noted that the above table does not indicate causality.

4.5 Multicollinearity

To test for Multicollinearity, the Variance Inflation Factors (VIF) was examined. For VIF test values greater than 10 and 1/VIF values less than 0.1 Multicollinearity is deemed to be present (Nachtsheim et. al, 2004).

Table 4.5: Variance Inflation Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>dTB</td>
<td>1.11</td>
<td>0.9050</td>
</tr>
<tr>
<td>INF</td>
<td>1.10</td>
<td>0.9116</td>
</tr>
<tr>
<td>DPOL</td>
<td>1.06</td>
<td>0.9415</td>
</tr>
<tr>
<td>dEXC</td>
<td>1.01</td>
<td>0.6540</td>
</tr>
<tr>
<td>dlnMS</td>
<td>1.48</td>
<td>0.6735</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>1.26</td>
<td></td>
</tr>
</tbody>
</table>

The above result shows that Multicollinearity is absent since the variance inflation factors are all less than 10 and the tolerance value are greater than 0.1.

4.6 Diagnostic Tests

Before running the regression, diagnostic tests were carried out.

4.6.1 Homoscedasticity

Using Breusch-Pagan test, results reveal that the variances of the random error terms are not constant across observations since the p-value is less than 0.05 implying that the error terms
are homoscedastic leading to the rejection of the null hypothesis of constant variance. As a remedy to this bias, robust standard errors will be used.

**Table 4.6: Breusch –Pagan test**

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

<table>
<thead>
<tr>
<th>Ho: Constant variance</th>
<th>Variables: Fitted values of stock return</th>
<th>Chi2(1) = 9.47</th>
<th>Prob&gt; chi2 = 0.0021</th>
</tr>
</thead>
</table>

4.6.2 Normality

The Skewness-Kurtosis tests for normality were applied in testing for normal distribution for every variable.

**Table 4.7: Skewness-Kurtosis tests**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pr(Skewness)</th>
<th>Pr (Kurtosis)</th>
<th>Chi2(2)</th>
<th>Prob&gt;Chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock return</td>
<td>0.0089</td>
<td>0.0002</td>
<td>16.87</td>
<td>0.0002</td>
</tr>
<tr>
<td>INF</td>
<td>0.0000</td>
<td>0.8516</td>
<td>17.40</td>
<td>0.0002</td>
</tr>
<tr>
<td>dEXC</td>
<td>0.0000</td>
<td>0.0000</td>
<td>38.58</td>
<td>0.0000</td>
</tr>
<tr>
<td>dTB</td>
<td>0.0014</td>
<td>0.0000</td>
<td>29.56</td>
<td>0.0000</td>
</tr>
<tr>
<td>dlnMS</td>
<td>0.1333</td>
<td>0.0000</td>
<td>19.31</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

The table above shows the test for normal distribution using skewness and kurtosis. The joint p-value for all the variables shows that we fail to reject the null hypothesis that their distribution is the same. On the basis of skewness we reject the null hypothesis that skewness of the distribution inflation and 91-day Treasury bill is different from the skewness of the distribution. Also on the basis of kurtosis all variables are platykurtic since they are less than 3.
4.6.3 Autocorrelation
Breusch-Godfrey test was used in testing for serial correlation. The test involves a
determination of lag length which is obtained by the Akaike Information Criterion (AIC).
The test results revealed that there is no serial correlation since the p-value of 0.0000 is less
than 0.05 hence the null hypothesis is rejected that no serial correlation.

Table 4.8: Breusch-Godfrey LM test for autocorrelation

<table>
<thead>
<tr>
<th>Lags(p)</th>
<th>Chi2</th>
<th>Degrees of freedom</th>
<th>Prob&gt; chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>155.232</td>
<td>1</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

H0: no serial correlation

4.7: Regression Results
Having conducted the diagnostic tests to test for the violation of Ordinary Least Squares
(OLS) assumption and for stationarity we regress the stock return on INF, EXC, lnMS, TB, and
DPOL i.e.

\[ Rs = \beta_0 + \beta_1 INF + \beta_2 EXC + \beta_3 \ln MS + \beta_4 TB + \beta_5 DPOL + \epsilon_i \]

Table 4.9: Regression results for the model

| Stock       | Coefficients | Robust Std. Err. | t   | P>|t| | [95% Conf. Interval] |
|-------------|--------------|------------------|-----|-----|---------------------|
| INF         | 0.0671       | 0.0457           | 1.47| 0.144| -0.023 0.1574       |
| dEXC        | -0.0053      | 0.0004           | -13.3| 0.000| -0.006 -0.0044      |
| dlnMS       | 0.0971       | 0.0044           | 22.0| 0.000| 0.088 0.1058        |
| dTB         | 0.0051       | 0.0015           | 3.40| 0.001| 0.002 0.0081        |
| DPOL        | -0.0097      | 0.0052           | -1.88| 0.062| -0.020 0.0005       |
| _cons       | 0.1033       | 0.0411           | 2.52| 0.013| 0.022 0.1843        |

Number of obs=180
F( 5,173)=152.97
Prob > F=0.0000
R-squared=0.7659
Adj R-squared=0.7592
Root MSE=0.02739
From the above table, the linear regression model below can be deduced. The independent variables are exponentially calculated as the dependent variable is in log form.

\[ \text{Rs} = 0.1033 + 0.0671\text{INF} - 0.0053\text{EXC} + 0.0971\ln\text{MS} + 0.0051\text{TB} - 0.0097\text{DPOL} \]

### 4.8 Interpretation and Discussion of the Findings

The coefficient for inflation is positive but statistically insignificant since the p-value is more than 0.05 level (p = 0.144). Holding all other factors constant the stock return will increase by 6% when inflation increases by 1%. The coefficient is positive which would indicate that the higher the inflation rate the higher the stock returns which is contrary to what we would expect. High inflation increases the price of commodities thus the scarce resources available for investment is channelled to consumption. This decreases demand for investment and stocks. These results are therefore contradict with other findings from other researchers such as (Nyang’oro, 2013). But it is consistent with other researchers like Oriwo and Ochieng (2012) who found a positive relationship between NASI and inflation.

The coefficient of exchange rate is negative and statistically significant since the p-value is less than 0.05 (p=0.000). When all other factors are held constant, the stock return will decrease by 0.0053% when exchange rate increases by 1%. When the currency depreciates in value it reduces the performance of NSE as per our results. A depreciation of the home currency against foreign currencies increases export, thus exchange rate was expected to have a negative relationship with the stock return. But from our results it is consistent with the outcome of other researchers like Osoro and Ogeto (2013) who concluded that currency depreciation reduces stock returns.
The coefficient of money supply is positive and statistically significant with a p-value of 0.000. Money supply in an economy will increase inflation, which will in turn increase expected stock return. Money supply and inflation increases future cash flow of firms. When all other factors are held constant, the stock return will increase by 0.097% when money supply increases by 1%. The result conforms to the economic theory because increase in money supply in an economy implies investors have adequate money to invest in securities exchange. The study is in agreement with early studies like Ogiji (2013) and Patel (2012).

91 Day Treasury bill is positive and statistically significant with a p-value of 0.001 which is less than 0.05. This implies that all other factors held constant, the stock return will increase by 0.514% when 91 Day Treasury bill increases by 1%. The coefficient for 91 Day Treasury bill is positive which conforms to economic theory. When the 91 Day Treasury bill go up investors opt to buy shares and stocks hence there is in stock market activity thus better returns. This contradicts what Oriwo and Ochieng (2012) found that increase in 91 Day Treasury bill means it becomes more attractive to invest in them as compared to investing on common shares at NSE and hence the decline in the stock market activity leading to decreased performance.

The coefficient of the dummy variable politics shows that the stock return decreases by 0.0095 units when political uncertainties exist within a country. The coefficient of the dummy variable for political events is negative and statistically insignificant at 5% but statistically significant at 10% level of confidence. This conforms to the economic theory that political instability scares investors away from investing. In Kenya, political economy has played a role in determining performance in NSE. Menge et al. (2014) found that during election periods that is periods increased political uncertainty, NSE performance rises before
the election day but declines after the election day as the fear of regime change over may affect the returns.

The results above indicate that regression did well in regard to the goodness of fit and also overall significance with an $R^2$ of 76.59%. This implies that 76.59% of the variation in the stock return is explained by the explanatory variables in the model. This leaves 23.41% unexplained by the model. F-statistic (0.0000) was significant at 5% level of significance an implication that the variables in the model were statistically significant to predict the dependent variable, stock returns.

A low p-value (less than 0.05) implies that the variable is significant in the model because a change in the independent variable is related to a change in the dependent variable. In our model, the predictor variables of exchange rate, money supply and 91 Day Treasury bill are significant because their p-value is less than 0.05 while the p-value for political event is greater than 0.05 which is 0.062 meaning it is significant at 10% level of significance. Inflation rate p-value is 0.144 which is greater than 0.05 and 0.1 implying that the variable is not statistically significant at both 5% and 10% significance levels.

The t-values give a test to the hypothesis that the coefficient is different from zero. In order to reject this we need a t-value greater than 1.96 at 0.05 confidence level. The t-values basically show the importance of a variable in the model. In this case, exchange rate, 91 Day Treasury bill, money supply are important since t-value is greater than 1.96 i.e. $-13.25$, 3.40 and 22.03 respectively. Inflation is not important as the t-value is much far less than 1.96 i.e. 1.47.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction
This chapter presents the summary of the findings of the study, conclusions and policy implications have also been made. The study had intended to determine the effect of macroeconomic factors and political events on the performance of the NSE for the period covering January 2000 to December 2014. The study was carried out in line with the objective of the study.

5.2 Summary
From the study, it has been found out that some of the macroeconomic factors have an effect on the performance of NSE as well as political occurrences in a country. In this study, the empirical investigation of the effect of the selected macroeconomic factors on the performance in NSE was done. In this situation some causal relationships among variables was established for the data used from January 2000 to December 2014. All the data used in this study was found to be non-stationary at level except stock returns and inflation but stationary at first difference.

5.3 Conclusion
The incorporation of weak, semi strong and strong form of information available in the market shows that information disclosure has an effect of how investors invest which will in turn affect NSE performance. There may be an effect on the general performance of the financial sector if the stock market performs poorly. This may consequently affect the general economy.
5.4 Policy Recommendations

From the findings above, it can be generalized that the government should be keen on frequent changes of various macroeconomic variables to be able to monitor the economic activities in an economy including capital market. The real market depends on all the variables discussed in this paper. Therefore, the study recommended that Central Bank should adopt better monetary policy measures to control the exchange rate and 91 Day Treasury bill because they are vital in determining stock market performance.

Stock market performance is an indicator to the foreign investors on the stability of the stock market; it’s therefore recommended that good measures should be put in place for example investor friendly policies to promote the stock market activities thus better stock market performance. Capital Market Authority should also keep a closer check on how the stock market functions, create and boost investor confidence and introduce new products in the stock market.

In developing the Kenyan stock market so that it is competitive with world leading stock markets, the study recommends that the government should emphasize on removal of bottlenecks that may hinder development of the NSE. This may include regulatory barriers which actually act as disincentives to investment in securities. In order to safeguard shareholders interests the CMA should check and revise any sharp practices by market operators (particularly the speculators). For instance, the 5 percent tax that was to be imposed is a disincentive to investors.

Investor’s confidence is important in any market operations. Potential investors particularly may be reluctant to invest in securities when they cannot give credence especially when some
firms fall and close down. As well introduction of an effective investor compensation fund may assure that only credible firms or individuals are licensed to operate investment banks and brokerage firms. This may boost investor confidence such that in case of a fall investors get compensated.

5.5 Limitations of the Study

To obtain the data for the NSE 20 share index was a bit challenging considering that NSE has not exposed its database. Therefore we had to get the data from the quarterly statistical bulletins. The findings of this study may represent all firms listed at the NSE in developing countries like Kenya even if they face same economic situations and same challenges.

5.6 Suggestions for Further Study

Since the macroeconomic variables keep on changing from time to time depending on economic situation prevailing in that time and demand in the capital market therefore this study may not reflect across listed companies thus research should be done on every listed company as different companies have different strategies for managing these macroeconomic variables in order to attract investors despite the economic situation not being favourable.
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