EFFECT OF MACRO-ECONOMIC FACTORS ON STOCK
RETURNS AT THE NAIROBI STOCK EXCHANGE

BY
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UNITED STATES INTERNATIONAL UNIVERSITY

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A Project Report Submitted to the Chandaria School of Business
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STUDENT’S DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

Signed: ______________________ Date: __________________

Stephen M. Mainga (613904)

This project has been presented for examination with my approval as the appointed supervisor.

Signed: ______________________ Date: __________________

Dr Amos Njuguna

Signed: ______________________ Date: __________________

Dean, Chandaria School of Business
This study evaluates the effect of macro-economic factors on stock returns at the Nairobi stock exchange. According to the stock market efficiency (SME) hypothesis, all past information on fiscal and monetary policy actions is reflected in current stock returns and so changes in money supply or budget deficit should not have any significant impact on stock returns. The main aim of this study was therefore to test if stocks returns at the Nairobi Stock Exchange (NSE) follow the efficiency hypothesis. The objectives of the study was to determine the relationship between stock returns at the NSE on one hand and public deficit, interest rates and inflation on the other hand.

The study uses regression analysis to establish the relationship between stock returns at the NSE and public deficits, interest rate, and inflation rate. Sixty data points are taken for the period beginning January 2008 to December 2012.

The findings of the study indicate that budget deficits do not have any significant relationship with stock returns at the Nairobi stock exchange. This is true across all the five years that were analyzed. This finding is in line with stock market efficiency theory but it’s in contrast to some of the previous studies done on the subject.

The study also found an inverse relationship between interest rates and stock returns in four out of the five years that were analyzed. A unit increase in interest rates led to a significant decrease in stock returns.

Inflation was also found to have an inverse relationship with stock returns in four out of the five years that were analyzed. A unit increase in inflation led to a significant decrease in stock returns but the relationship was not as strong as that observed with interest rates.

The major recommendation of this study is that more research is needed to establish whether indeed the lack of a significant relationship between stock returns and fiscal deficits in Kenya...
is because the Kenya stock market is efficient in terms of information on fiscal policy actions or there are other reasons why fiscal deficits do not seem to matter. Interest rates and Inflation on the other hand have been found to adversely impact stock returns at the Nairobi stock exchange. This indicates that high interest rates and inflation do harm to the economy and the major recommendation for improvement is that the government should pursue policies aimed at bringing interest rates down and containing inflation.
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DEDICATION

I dedicate this research to my kids, Mumo and Mueni. You inspire me to work hard and achieve more.
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CHAPTER 1

1.0 INTRODUCTION

1.1 Background to the Problem

The Stock market Efficiency hypothesis states that stock prices fully reflect all past and current publicly available information. This means that there should be no statistically significant relationships between fiscal policy actions like deficits, monetary policy actions like money growth on one hand, and stock returns on the other hand. Stock prices are expected to fully incorporate all available information on policy changes (Laopodis, 2007).

The efficient-market hypothesis posits that financial markets are efficient meaning that an investor cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis, given the information available at the time of making the investment. Malkiel, (2003), defines markets as efficient if they do not allow investors to earn above-average returns without accepting above-average risks.

Efficient market hypothesis (EMH) has three major forms namely; weak, semi-strong and strong. In the week state, EMH claims that prices on traded assets like stocks and bonds already reflect all past publicly available information. In the semi-strong state, EMH claims that prices reflect all publicly available information with prices instantly changing to reflect new public information. In the strong-form, EMH asserts that share prices reflect all information, both public and private. Some critics have attributed the financial crisis of the late-2000s to this belief in rational markets. However, the proponents of the hypothesis assert that while market efficiency does not mean having no uncertainty about the future, the market is practically efficient for investment purposes for most individuals.

The genesis of EMH is closely linked to the random-walk model developed by Jules Regnault in 1863 and then by Louis Bachelier in 1900. Although the random walk model was initially largely ignored by many academics, independent work done from the 1930s started to validate this theory. Early studies indicated that US stock prices and related financial series followed a random walk model suggesting that professional investors were in general unable to outperform the market. In one of the most quoted piece of work, a random walk
down Wall Street, Malkiel G.B in 1973 asserted that a blindfolded chimpanzee throwing darts at the Wall Street Journal could select a portfolio that would do as well as the experts.

In the early 1960s, Professor Eugene Fama of the University of Chicago’s Booth School of Business developed the efficient market hypothesis as an academic concept of study through his published Ph.D. thesis. In 1965, he published his dissertation arguing for the random walk hypothesis. Later in 1970 Fama published a review of both the theory and the evidence for the hypothesis. He now extended and refined the theory to include definitions for three forms of financial market efficiency i.e. weak, semi-strong and strong. The theory found wide acceptance but started being questioned in the 1990s by behavioral finance economists. Empirical analyses have consistently found problems with the efficient-market hypothesis, the most consistent being that stocks with low price to earnings outperform other stocks. It has been said that cognitive biases cause these inefficiencies as investors tend to purchase overpriced growth stocks rather than value stocks. Even with the controversies around the efficient-market hypothesis, Beechey et al. (2000) considers that it remains a worthwhile starting point.

Efficient-market hypothesis requires that agents have rational expectations such that on average the market is correct even if no one particular agent is correct. Expectations of the market players changes as new information becomes available in the market. The theory recognizes that when faced with new information, some investors may overreact and some may under react hence it does not require that each agent must be rational. The requirement is that investors' reactions are random and follow a normal distribution pattern so that the net effect on market prices cannot be reliably exploited to make an abnormal profit, especially when considering transaction costs. In other words, the market as a whole is always right although individual players may be wrong. Hence in the weak form efficiency, future prices are independent of historical prices and excess returns cannot be earned by using strategies based on analysis of historical data. This means that future price movements cannot be predicted based on price series but rather prices do follow a random walk and market players cannot profit from market inefficiencies. In semi strong form, share prices rapidly adjust to publicly available new information and no excess returns can be earned by trading on that
information. In strong-form efficiency, share prices reflect all information, public and private, and no one can earn excess returns. There should be no barriers to private information becoming public and there should be strong insider trading rules. The adherents to this theory consider it futile to search for shares of firms who are thought to be undervalued or to predict future movements in the prices and/or returns from these same securities. Any new information will reflect in the prices of stocks. Random walk theory followers therefore believe that it is impossible to predict future prices and investors should just accept the efficient market hypothesis (Jarret, 2010).

The Kenyan fiscal policy is contained in various government documents such as the National Development Plan, the sessional papers, the annual Budget Speech and the annual Financial Statement. Formulation and implementation of policy is managed by the Ministry of Finance and Planning (the Treasury and the Kenya Revenue Authority), with Parliament approving the annual expenditure estimates tabled in the House. The Controller and Auditor General scrutinize the spending of public expenditures and propose remedial measures for suspected misuse of public funds in his annual reports. Likewise, the Public accounts committee (PAC) and the Public investment committee (PIC), scrutinizes reports of the Controller and Auditor General and bring out issues concerning misappropriation of public funds which are in turn discussed in Parliament. The Kenyan fiscal policy is largely designed to mitigate the effects of market failures, Promote economic stability, Encourage efficient allocation of resources, Promote savings and investments, and Reduce income inequalities and disparities. But since the 1990s, the management of fiscal policy in Kenya has been characterized by problems in revenue mobilization and lack of transparency and accountability in the management of revenue. These developments have contributed to persistent increases in budget deficits and public debts, and also the poor performance of the economy (African Centre for Economic Growth [ACEG], 2003)

The major source of revenue in Kenya is taxation. Other sources include compulsory fees, fines and penalties; income from government property; and sale of goods and services. In an effort to improve revenue mobilization, the government embarked on the Tax Modernization Program (TMP) in the late 1980s. This culminated in major changes in tax structure, rate and
rating categories; and also to the creation of the Kenya Revenue Authority (KRA) as an autonomous body in 1995 through an Act of Parliament. This streamlined the tax collection process by bringing together all revenue units, and introducing the Personal Identification Number (PIN). The latter helped in updating tax records and maximizing on tax receipts (ACEG, 2003).

A look at the past 10 years indicates strong growth in public debt from KES 626.5bn in December 2002 (51.5% of GDP) to KES 1.8tr (46.4% of GDP) in December 2012. Domestic debt has risen over the years to account for a higher proportion of total debt, standing at 54.2% in Dec 2012 compared to 40.7% in Dec 2002. By June 2006, Kenya’s public and publicly guaranteed debt stood at Ksh 789.1 billion. Of this, domestic debt amounted to Ksh 357.8 billion or 45.3 percent of total debt while external debt stood at Ksh 431.2 billion at the end of June 2006, which was 54.7 percent of the overall debt stock (Central Bank of Kenya, 2006). By June 2012, Kenya’s public and publicly guaranteed debt stood at Ksh 1.6 Trillion. Of this, domestic debt amounted to Ksh 858.8 billion or 52.6 percent of total debt while external debt stood at Ksh 774 billion at the end of June 2006, which was 47.4 percent of the overall debt stock (Central Bank of Kenya, 2013).

Dealing in shares and stocks in Kenya started in the 1920’s when the country was still a British colony. There was no formal stock market, rules or regulations in those days to govern stock broking activities. Trading was done on the basis of a gentleman’s agreement and was carried out as a sidelines business by accountants, auctioneers, estate agents and lawyers. The first professional stock broking firm was established in 1951 by an Estate agent by name of Francis Drummond. He later impressed upon the then Finance minister the need of setting up a stock exchange. They then approached officials of the London stock exchange in July 1953 who accepted to recognize the setting up of the Nairobi stock exchange as an overseas stock exchange.

In 1954 the Nairobi Stock Exchange was constituted as a voluntary association of stockbrokers registered under the Societies Act. Africans and Asians were not allowed to trade in securities until after independence in 1963. Consequently, after independence, stock
Market activity slumped due to uncertainty about the future of independent Kenya. Activity picked up gradually and in 1988, the first privatization through the NSE took place when the government of Kenya successfully sold a 20% stake in Kenya Commercial Bank.

In Feb 1994, the NSE 20-Share Index recorded an all-record high of 5030 points and the NSE was rated by the International Finance Corporation (IFC) as the best performing market in the world with a return of 179% in dollar terms. In the same year, the NSE moved to more spacious premises at the Nation Centre and also set up a computerized delivery and settlement system (DASS). It was also at the same time that the number of stockbrokers increased with the licensing of 8 new brokers. Other notable share offers through the NSE include the privatization of Kenya Airways by the Kenya government and the Safaricom initial public offer.

The rest of this chapter is organized as follows. The next section comprises of the problem statement followed by the objectives of the study after which we define the terms and conclude the chapter.

1.2 Problem Statement
The aim of this study was to establish the extent to which stock prices at the Nairobi stock exchange take into account all publicly available information on fiscal policy actions. This study did not seek to resolve the stock market efficiency debate but rather to add to the available literature by investigating the extent to which stock prices at the Nairobi stock exchange (NSE) incorporate all publicly available information on fiscal policy moves (as measured by budget deficits). Deficits are generally considered to affect stocks prices and the theoretical reasons for this will be explored later in chapter two. The sensitivity of the stock market to changes in public deficits will be examined for Kenya for the period from 2008 to 2012. The sensitivity of the NSE 20 Share index to changes in public debt and deficit will be examined for the period 2008 to 2012. To avoid bias in the study and also in line with available literature and economic theory, the study also incorporated some monetary variables namely, interest rate and the inflation rate.
Interest rates were incorporated in the study because large budgetary deficits adversely impact stock and bond prices by increasing interest rates. Higher interest rates in turn reduce business capital spending and private consumption which all impact real economic activity. This eventually affects the financial markets by reducing asset prices and household wealth further raising the cost of borrowing and reducing business spending. In the end, higher interest rates coupled with weaker economic activity increases the fiscal imbalance triggering another round of such negative effects and thus reinforcing the vicious circle (Laopodis, 2007). While monetary policy and stock market efficiency has been extensively studied (e.g., Bernanke, 2004), there are very few studies that have focused on the relationship between fiscal policy (budget deficits) and stock market efficiency and none appears to have been done on the Kenyan stock market.

1.3 General Objective
The main objective of the study was to evaluate the effect of macro-economic factors on stock returns at the Nairobi stock exchange.

1.4 Specific Objectives
1.4.1 To determine the relationship between public deficit and stock returns at the Nairobi stock exchange
1.4.2 To establish the relationship between interest rates and stock returns at the Nairobi stock exchange
1.4.3 To determine the relationship between inflation and stock returns at the Nairobi stock exchange

1.5 Justification for the Study
This study is of benefit to the following constituents;

1.5.1 Government of Kenya
The findings of this study provide significant insights into information efficiency at the Nairobi stock exchange and this is very relevant to policy makers. The findings indicate that
fiscal deficits do not have a significant impact on stock returns but interest rates and inflation have been found to adversely affect stock returns at the Nairobi stock exchange. This indicates that high interest rates do harm to the economy and the government should pursue policies aimed at bringing interest rates down and containing inflation.

1.5.1 Investors in the Nairobi stock exchange
The findings are of benefit to investors as they indicate that the market is fairly efficient in terms of information on fiscal policy with budget deficits not seen to have a significant impact on stock returns. No investor seems to be gaining abnormally by access to information not available to the other investors. However, Investors need to take note of movements in interest rates and inflation as this has been found to have a negative impact on stock returns.

1.5.1 The capital markets Authority
The finding that the Nairobi stock exchange is fairly efficient in terms of information on fiscal policy is of particular benefit to the regulator as it indicates that no investors are making abnormal returns from the market by use of information on fiscal policy which is not in the public domain. The regulator is always on the lookout for factors that may create market imperfections like insider dealings hence these findings are re-assuring.

1.6 Scope of the Study
This study investigated the relationship between stock returns at the Nairobi stock exchange and government fiscal policy in Kenya for a period of 5 years beginning 2008 to 2012. The sensitivity of the stock market to changes in budget deficit was evaluated for those 5 years. To increase the objectivity of the study and in line with economic theory, some monetary variables, namely, interest rates and inflation rate were incorporated in the regression model. The NSE 20 share index was used as representative measure of stock prices at the NSE. Statistics were collected from the Kenya bureau of statistics and the Nairobi stock exchange.
1.7 Definition of Terms

1.7.1 Fiscal policy
Fiscal policy refers to the government’s actions affecting its receipts and expenditures ordinarily measured by government net receipts, its budget surplus or deficits (Thingan, 2003)

1.7.2 Interest rate
The interest rate is the price paid for the use of money for a period of time (Moles and Terry, 1997).

1.7.3 Government budget
A budget is a detailed plan which sets out, in money terms, the plans for income and expenditure in respect of a future period of time. It is prepared in advance of that time period and is based on the agreed objectives of that period of time together with the strategy planned to achieve those objectives (Weetman, 1996).

1.7.4 Public deficit
The deficit of the public sector, as measured by public sector borrowing requirements, is the result of the difference between government spending and government revenues (World bank, 1994).

1.7.5 Government Debt
The deficit of the public sector, as measured by public sector borrowing requirements, is the result of the difference between government spending and government revenues (Easterly, Rodriguez and Schmidt-Hebbel, 1994).
1.7.6 Inflation
Inflation is a general level of prices of goods and services in an economy over a period of time generally measured by an index. The most common index is the consumer price index (CPI) (Mayo, 2006).

1.7.7 Stock Exchange
A stock exchange is a secondary market for shares in corporations. It’s secondary because the shares are already in existence and trade takes place between the investors without involving the corporation (Bailey, 2005).

1.7.8 Stock Index
A stock index is an average of stock prices which summarizes the pattern of share prices in a stock market (Bailey, 2005).

1.8 Chapter Summary
This chapter has given the background of the study, identified the problem statement and laid down the objectives of the study. The users of the study have been identified as investors in the NSE, the regulators of the stock market and government policy makers. Chapter 2 reviews the relevant literature and highlights findings of previous studies on this subject that have been carried out in other markets. Chapter 3 details the research method that was followed and data collection and analysis methods. Chapter 4 is a presentation of the data that was collected together with the findings of the study while Chapter five is a conclusion of the study and my recommendations based on my findings.
CHAPTER 2
2.0 LITERATURE REVIEW

2.1 Introduction
This chapter reviews different studies done on stock market returns and macro economic factors in various markets. The chapter starts by discussing the effect of budget deficit on stock returns, then discusses the impact of interest rates on stock returns and finally discusses the impact of inflation on stock returns.

2.2 The Relationship Between Deficits and Stock Returns
Keynesian economists advocate the use of the government's fiscal policy to offset imbalances in the economy. A government runs a deficit to stimulate an economy slowed by a recession. However, to slow down an economy threatened by inflationary pressures, a government increases taxes or cuts spending to create a budget surplus that would act as a drag on the economy. Fiscal policy thus acts as an automatic stabilizer for the economy by automatically responding to changes in economic activity. Zagler & Durnecker (2003) posits that fiscal policy is predominantly an instrument to mitigate short-run fluctuations of output and employment. By a variation in government spending or taxation, fiscal policy aims at altering aggregate demand thus moving the economy closer to potential output. But although fiscal policy can thus be viewed as aimed at leveling short-term fluctuations, the long-run implications of short run policy instruments in taxation and government expenditure cannot be ignored. Fiscal policy is considered expansionary when public expenditures exceed public revenues. The resulting deficit can be interpreted as a means to finance additional government expenditures.

By varying government expenditure and taxation, fiscal policy can affect national income, employment, output and prices. Increasing expenditure during depression adds to aggregate demand for goods and services leading to increase in income through the multiplier effect. Decreasing public expenditure during inflation reduces aggregate demand, national income, employment, output and prices. Increasing taxes reduces disposable income thereby reducing consumption and investment expenditure. Government can therefore control deflationary and
inflationary pressures in the economy by a judicious combination of expenditure and taxation programmes (Thingan, 2003).

Budget is the principal instrument of fiscal policy. It exercises control over size and relationship of government receipts and expenditures. A Budget deficit is the preferred fiscal policy instrument during depression. Government expenditure exceeds receipts putting larger amounts into the stream of national income than are withdrawn. Budget deficit therefore has an expansionary effect on aggregate demand. A deficit can arise from increased government spending or a reduction on taxes without increasing government spending. Reduction in taxes leaves larger disposal income in the hands of the people thus stimulating increased consumption expenditure leading to a rise in aggregate demand. On the other hand, Surplus budget is the preferred fiscal policy in times of economic boom. This occurs when government revenue exceeds expenditure. This is meant to control inflation pressures within the economy. It could be through increase in taxation or reduction in government expenditure or both. This reduces income and aggregate demand (Thingan, 2003).

A Balanced budget multiplier is a tool where increases in taxes and in government expenditure are of an equal amount. Net impact is increasing of net national income as the reduction in consumption resulting from the tax is not equal to the government expenditure. A Compensatory fiscal policy is a policy that aims at continuously compensating the economy against chronic tendencies towards inflation and deflation by manipulating public expenditures and taxes. This calls for adoption of fiscal measures over the long-run rather than once for all measures at a point in time. At deflationary tendency, government increases expenditure through deficit budgeting and reduction in taxes. This compensates for the lack in private investment and raises effective demand, employment, output and income within the economy. At inflationary tendencies, government reduces expenditure by having a surplus budget and raising taxes in order to stabilize economy at full employment level (Thingan, 2003).
Private saving constitutes the after-tax income that households save instead of consuming and public saving on the other hand constitutes the tax revenue that governments save instead of spending. When the government runs a deficit, the public saving will be negative thereby reducing the national saving in the economy. Laopodis (2007) posits that budget deficits negatively affect stock and bond prices by leading to increases in interest rates. When interest rates go up, business capital spending as well as expenditure is reduced which then affects real economic activity by lowering supply and demand. This further affects financial markets by reducing household wealth and asset prices. This leads to further increases in the cost of borrowing and the higher interest rates coupled with weaker economic activity leads to further deterioration of the fiscal imbalance and this becomes a vicious repetitive cycle.

Faiza et al (2012) argue that the saving of a country is equal to the sum of investment and net exports. Therefore when budget deficits reduce national saving the eventual impact is a reduction in investment or a reduction in net exports, or both. The reduction in investment and net exports is equal to the fall in national saving. They further state that budget deficits create a flow of assets abroad meaning that when a country imports more than it exports, it does not receive these extra goods and services for free but it gives up assets in return. The assets given up could initially be the local currency but the foreign exporters will use this money to buy corporate or government bonds or equity. Hence when a budget deficit turns a country into a net importer of goods and services the country also becomes a net exporter of assets.

When the national saving declines, it reduces money supply in the economy reducing the amount of money available for borrowing by private borrowers which pushes up the interest rate. When the cost of borrowing goes up, households and firms choose to reduce investment. The higher interest rates also affect the flow of capital across national boundaries. As domestic assets pay higher returns, they become more attractive to investors both at home and abroad. The increased demand for domestic assets affects the market for foreign currency since if a foreigner wants to buy a domestic bond, he must first acquire the domestic currency. Hence a rise in interest rates increases the demand for the domestic currency.
causing the currency to appreciate. This appreciation of the currency in turn affects trade in goods and services. A strong currency makes domestically produced goods more expensive and foreign goods cheaper. Exports fall and imports rise and the trade balance moves towards a deficit (Faiza et al, 2012).

Laopodis (2007) studied the extent and nature of relationship between US fiscal policy actions and the stock market’s behaviour for the 1968–2005. He also examined if the US stock market was efficient in respect to the informational content of fiscal policy regarding federal deficits. He found that past budget deficits were affecting current stock prices in a negative and significant manner. This suggested that the US stock market was inefficient to the available information about future fiscal policy actions. He found this to be true even after allowing for other factors like monetary policy and other financial and macroeconomic variables. He concluded that the market does not place much faith on news about the effects of budget deficits on long term interest rates instead considering news about monetary policy to be more important. This might therefore adversely impact the stock market and the overall economy.

The current and the future economic growth of economy is reflected in the country stock market performance and in situations where a deficit acts to reduce investments then it eventually affects the stock market performance. When the budget is in deficit, stock prices may be depressed thereby undermining investor confidence and this will also impact firm’s ability to get capital on favorable terms. However, higher budget deficits could at times boost stock prices especially when governments use fiscal deficits as a tool to simulate an economy in recession. A Budget deficit is actually the preferred fiscal policy instrument during depression. Government expenditure exceeds receipts putting larger amounts into the stream of national income than are withdrawn. Budget deficit therefore has an expansionary effect on aggregate demand. A deficit can arise from increased government spending or a reduction on taxes without increasing government spending. Reduction in taxes leaves larger disposal income in the hands of the people thus stimulating increased consumption expenditure leading to a rise in aggregate demand. On the other hand, Surplus budget is the preferred
fiscal policy in times of economic boom. This occurs when government revenue exceeds expenditure. This is meant to control inflation pressures within the economy. It could be through increase in taxation or reduction in government expenditure or both. This reduces income and aggregate demand (Thingan, 2003).

A huge budget deficit currently is a pointer to future raise in inflation or increase in taxes. Future inflation rate anticipation may either increase or decrease the firm’s value. This works through increasing or decreasing the real value of corporate debt as increase in inflationary expectations gives benefit to equity instruments by decreasing the real value of corporate debt while a decrease in the future inflation rate decreases equity values as the real value of debt increases thereby reducing the firm’s value. Also inflationary expectations affect nominal interest rates and this may cause stock prices to go up because lower rates mean a higher present value of future earnings. On the other hand, lower inflationary expectations may lower expected future earnings leading to a drop in stock prices (Faiza et al, 2012).

Quayes (2010) studied the relationship between budget deficit and stock prices using co-integration analysis finding that both budget deficits and inflation have a negative impact on stock prices.

Faiza et al, (2012) noted that budget deficits is affected or affects several factors which in turn affect stock prices. It would therefore appear like there is no specific economic theory explaining how budget deficits affect stock returns. This study while aim at providing empirical evidence regarding budget deficits and their effects on stock prices in a small market like Kenya. The study examines if changes in deficits causes changes in stock prices.

2.3 The Relationship between Interest rates and Stock Returns

According to Uddin and Alam (2009), an interest rate is described as the cost of borrowing or lending money and is normally expressed as an annual percentage rate. In other words, interest rate is the cost of capital or the price for using money in a certain period of time. It’s a very critical macroeconomic variable which affects economic growth. Interest rates are a
crucial variable in macro-economy and in practical world of finance. Changes in interest rates influence many economic phenomena like level of consumer expenditure on durable goods, investment expenditure on plants, equipment, technology and the way wealth is re-distributed between borrowers and lenders. It also influences the price of financial assets such as stocks, bonds and foreign currencies, incomes from savings accounts, certificates of deposit, various types of bonds and money market mutual fund shares (Thomas, 2006).

Interest rate is a key macroeconomic variable in an economy and is directly linked to economic growth. A wise investor aims at investing in an efficient market where there is no possibility of making super profits through arbitrage. When the rate of interest paid by banks to depositors increases, people normally switch their capital from share market to interest earning deposits placed with banks. This leads to decrease in the demand of shares and thereby decrease the price of share and vice versa. Also when the rate of interest paid by banks to depositor’s increases, the lending interest rate also increases leading to a slowdown in investments in the economy which also causes further drop in share prices. The vice versa is also true hence in theory there is an inverse relationship between share price and interest rate (Uddin and Alam, 2007).

High interest rates reduce business capital spending and private consumption which all impact real economic activity. This eventually affects the financial markets by reducing asset prices and household wealth further raising the cost of borrowing and reducing business spending. In the end, higher interest rates coupled with weaker economic activity increases the fiscal imbalance triggering another round of such negative effects and thus reinforcing the vicious circle (Laopodis, 2007).

Lee (1997) analyzes the relationship between the stock market and the short-term interest rate using three-year rolling regressions. He tried to forecast excess returns (represented by stock returns above the risk free short term interest rate) on the Standard and Poor 500 index with the short-term interest rate. He found that the relationship is not stable over time as it
gradually changes from a significantly negative to no relationship, or even a positive although insignificant relationship.

Jefferis and Okeahalam (2000) analyzed stock returns in South Africa, Botswana and Zimbabwe stock market. They found that higher interest rates tend to depress stock prices through the substitution effect (i.e. investors switching to interest-bearing assets which are deemed more attractive relative to shares), an increase in the discount rate (which reduces present value of future expected returns), or a depressing effect on investment and hence on expected future profits.

Harasty and Roulet (2000) showed that stock prices in 17 developed countries are correlated with the long term interest rate in each country. Spyrou (2001) found that inflation and stock returns are negatively related in the Greece stock market but only up to 1995 after which the relationship became insignificant.

Arango (2002) studied the relationship between the share prices on the Bogota stock market and the interest rate as measured by the inter bank loan interest rate and found some evidence of nonlinear and inverse relationship. He found that in this market there is high dependence of returns in short periods. Hsing (2004) studied several factors such as, output, real interest rate, exchange rate and the stock market index. He found a negative relationship between stock prices and interest rate. Zordan (2005) took an historical approach to this question. He posited that historical data supports the existence of an inverse relationship between interest rates and stock prices but this appears to happen in cycles. He identifies cycles way back from the 1880’s and the period before the Second World War. He further posits that between 1940 and 1960’s there was stable inflation and interest rates and stocks did well in this period.

Uddin and Alam (2007) examined the linear relationship between share price and interest rate, share price and changes of interest rate, changes of share price and interest rate, and changes of share price and changes of interest rate on the Dhaka Stock Exchange (DSE).
In all these cases, it was found that not only do interest rates have a significant negative relationship with Share Price but also that changes in interest rates have a significant negative relationship with changes in share prices.

Uddin and Alam (2009) examined market efficiency in fifteen countries particularly focusing on how interest rates affect stock prices and also whether a change in interest rates causes a change in stock prices. The basic assumption of efficient market hypothesis is that stock returns are random and were this is not the case then it means that the market are not efficient. For the fifteen countries examined, they found mixed results which cut across both developed and developing countries. Malaysia was notable in this study as they found that whereas there was no relationship between interest rates and share prices; changes in interest rate had a negative relationship with changes in stock prices. Four countries in their study were found to have negative relationships between both interest rates and stock prices and changes in interest rates and changes in stock prices. In other eight countries in their study, they found significant negative relationships between interest rates and stock prices but there was no correlation between changes in interest rates and changes in stock prices.

From this study, Uddin and Alam (2009) concluded that the basic assumption of efficient market hypothesis on the randomness of stock prices was not met in all the fifteen countries stock exchange meaning that these markets are not efficient in weak form. However, they do not reject the theoretical argument of negative relationship between stock price and prevailing interest rate. In Japan, they found that interest rate had a positive relationship with change in share price but change in interest rate had a negative relationship with change of share price. Four countries namely Bangladesh, Colombia, Italy, and S. Africa showed negative relationship for both Interest Rates with Share price and Changes of Interest Rate with Changes of Share Price. Eight other countries in their study namely, Australia, Canada, Chile, Germany, Jamaica, Mexico, Spain, and Venezuela had significant negative relationship between Interest Rates and Share price but no relationship between change of Interest Rate and change of Share Price. From their sample of fifteen countries, all countries
with the exception of Philippine showed significant negative relationship either Interest Rates with Share price or Changes of Interest Rate with Changes of Share Price or both.

2.4 The Relationship between Inflation and Stock Returns

Inflation can be defined a rise in the general level of prices of goods and services in an economy over a period of time. As the general price level rises, each unit of currency buys fewer goods and services. Hence inflation is erosion of the purchasing power of money. Price inflation is measured by the inflation rate which is normally computed by the annualized percentage change in a general price index (normally the Consumer price index) over time. Inflation results in a decrease in the real value of money and other monetary items over time. The uncertainty over future inflation may discourage investment and savings and high inflation may lead to consumer’s hording goods in anticipation of future price increases which may create temporary shortages. Brandt and Wang (2003) argue that risk aversion is time-varying. They thus suggest that inflation makes investors more risk averse which in turn drives up equity risk premiums.

Lee (2009) noted that stocks have for a long time been thought of as a natural hedge against inflation. This is because stocks represent claims against physical assets which are deemed to be indifferent to movement in inflation rates. The classic Fisher model developed by Fisher in 1930s postulated that nominal assets should provide a natural hedge against inflation. But negative relationships between stock returns and various measures of expected and unexpected inflation have since been observed in the US and other industrialized countries. Gallagher and Taylor (2002), find evidence that stock returns are negatively affected by both expected and unexpected inflation. These studies tend to explain the negative linkage among stock returns and inflation to be linked to money demand and the quantity theory of money. In the period after the Second World War, the negative relation between stock returns and inflation was found to be caused by money demand and counter-cyclical money supply effects. Hence the negative relationship between inflation and stock returns found in the various studies may be a reflection of real economic fluctuations, monetary fluctuations, or changes in both real and monetary variables.
Engsted and Tanggaard (2002), find a moderately positive relationship between expected stock returns and expected inflation for the US and a strong positive relationship for Denmark. Sharpe (2002) provides empirical findings that suggest that a rise in expected inflation reduces equity prices in the US. Rapach (2002) studies the long-run real stock price response to a permanent inflation shock for 16 industrialized countries and finds them to be zero or positive. Choudhry (2001) studies the relationship between current stock returns and current inflation in four high inflation countries (Argentina, Chile, Mexico and Venezuela) and finds a positive relationship. In a study for 10 Emerging Stock Markets (ESM), namely Chile, Mexico, Brazil, Argentina, Thailand, South Korea, Malaysia, Hong Kong, Philippines and Turkey during 1990s, Spyrou (2004) finds a positive relationship between the two variables. However, Omran and Pointon (2001) find a negative relationship between the two variables for Egypt. Apergis and Eleftheriou (2002) find a negative relationship for Greece but Spyrou (2001) finds a negative relationship between inflation and stock returns in Greece only for the period until 1995. For the period 1196 to 2000 he finds no statistically significant relationship. Given this mixed findings in recent studies, it’s obvious that the question of the relationship between inflation and stock returns is still wide open and there is need for further research on the issue.

Hondroyiannis and Papapetrou, 2005 studied the relationship between real stock returns and inflation in Greece. They decomposed inflation into two components with first component comprising of supply shocks which reflect movements in real activity. The second component is demand shocks and acts as a proxy for unexpected movements like changes in monetary policy. They deem the supply shock to be permanent inflation while the demand shock is temporary inflation. The permanent component of inflation is associated with changes in supply like changes in energy prices or the terms of trade. The temporary component on the other hand is associated with changes in aggregate demand such as monetary policy shocks and government spending shocks. Price changes affect stock returns through two channels. In channel 1, an increase in inflation negatively affects economic growth since it adversely affects investment and production. This creates uncertainty in the
economy with negative impact on real economic activity. The result is a negative relationship between real stock returns and inflation.

Ritter and Warr (2002) support the inflation illusion hypothesis as they found that the bull market starting in 1982 was due in part to undervaluation of levered equities caused by mistakes in the use of nominal and real capitalization rates. Campbell and Vuolteenaho (2004) used data from the period between 1927 and 2002 finding evidence of inflation-induced mispricing further supporting the inflation illusion hypothesis. Cohen et al. (2005) analyzed Treasury bills, safe stocks, and risky stocks and found further support of the inflation illusion hypothesis.

Lee (2009) tested the inflation illusion hypothesis and found that the hypothesis explains post-war data very well, but not pre-war data. The finding was consistent across all industrialized countries reviewed. He therefore concludes that inflation makes investors more risk averse and the increased risk aversion is what drives up stock risk premiums. He also found the inflation illusion hypothesis to explain the post war relationship between stock returns and inflation very well but does not find it compatible with some observations of the same relationship in the pre-war period. He points out that the hypothesis anticipates stocks being underpriced with high inflation but instead he finds over pricing with high inflation in the pre-war period. He therefore posits that participants in the stock market are subject to inflation illusion over time. This finding suggests that the relationship between stock returns and inflation could be time varying driven by the changes and interplay between various competing economic forces.

Hondroyiannis and Papapetrou (2005) suggest that actual inflation does not significantly influence real stock market returns. The results of their study show that stock market performance is not related to any source of inflation in the economy and stock market performance in Greece is not related to inflation rate movements and is rather regime dependent.
2.5 Conclusion
This chapter has examined the theoretical background of the study and various similar studies that have been done on the subject in various markets. We saw that there is no specific economic theory that explains why budget deficits affect stock prices. The impact is more of a secondary nature whereby deficits affect other factors like tax expectations, interest rates and inflation which in turn affect the stock prices. The studies done on the relationship between interest rates and inflation across various markets show mixed returns. This study will therefore present empirical evidence to show the nature and extend of relationship between budget deficits, interest rates and inflation on stock returns in a small market like Kenya. In the next chapter, we will look at the research methodology that was followed in this research.
CHAPTER 3
3.0 RESEARCH METHODOLOGY

3.1 Introduction
This chapter discusses the research methodology that was followed to realize the objectives of the study. The chapter also discusses the research design, data sources, research procedures and the data collection instruments. The study was a survey of the variables under study for a period of 5 years from January 2008 to December 2012. The data is available from secondary sources.

3.2 Research Design
A research design is a plan for selecting the sources and types of information to be used in answering research questions. It encompasses the framework for specifying the relationships among the study variables and a blueprint that outlines each research procedure (Cooper and Schindler, 2001).

This is a cross-sectional study attempting to establish if there is a relationship between interest rates, inflation and budget deficits with stock returns at the Nairobi stock exchange. Secondary data for the variables under study was collected for a period of five years and analyzed to establish if a relationship exists. A cross-sectional study, also known as a cross-sectional analysis, is a descriptive type of study but differs from a longitudinal study in that data is collected at one point in time. The cross-sectional study approach was adopted for this study because data was gathered once and this approach consumes less time and is very cost-effective as it uses data that has already been collected. Cross-sectional analysis is used in the study to establish if a relationship exists between the independent variables and the dependent variable.

The independent variables in this study are budget deficits, interest rates and inflation rates. The dependent variable is stock returns at the Nairobi stock exchange. Cross-sectional analysis is used to establish if a relationship exists between these variables. The study uses inferential statistics to analyze the data collected.
3.3 Data and number of Observations

Given that this is a 5 year survey of the variables, the data for each variable was collected on a monthly basis in order to get a large number of observations which can lead to valid statistical conclusions after analysis. The data used in the study is the 91 day Treasury bill rate, the month on month inflation rate, the daily NSE stock index averaged to arrive at a monthly average figure and the monthly budget deficit from government finances published by the central bank of Kenya. For each variable 60 observations were made except for the NSE 20 share index were data was available on a daily basis giving 1,825 observations. However, the daily NSE index was reduced to a monthly figure by taking an average of the daily index for each month. This ensured that the observations for each variable were 60.

3.4 Data Sources

Interest rate data was downloaded from the central bank of Kenya website, https://www.centralbank.go.ke/index.php/time-series-data-2, where they publish time series data from 1991 to date.

Budget deficits were computed from government finance statistics downloaded from the central bank of Kenya website, https://www.centralbank.go.ke/index.php/government-finance-statistics, where they publish composition of government revenue and expenditure.

Inflation rate data was downloaded from the Kenya national bureau of statistics website, http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=8&Itemid=562, where they publish consumer price index data.

Data on the NSE 20 share index was obtained from the Nairobi securities exchange.

3.5 Data Collection Instrument

The tool of data collection used in this study was a secondary data collection template which had guidance on the type of data required to answer the research questions. The template had various columns that needed to be populated with the required data. This helped focus
collection of data to data which is relevant for the research. This secondary data collection template is provided as appendix 11.

3.6 Data Collection Method

The data used in this study was secondary in nature and was sourced from the websites of the Central Bank of Kenya, the Kenya Bureau of Statistics and from the Nairobi Stock Exchange. According to Cooper and Schindler (2001), secondary data is an interpretation of primary data. In this case the bodies mentioned above have already collected the primary data, analyzed and used it to publish the secondary data. The main advantage of using secondary data for this study is that the data is not otherwise available as it’s only held by these bodies. Using secondary data also saves time and is cheaper than trying to do primary research. However, on the converse, there is no control over how this data was collected and there could be biases in the data which may not be apparent.

3.7 Research Procedures

The secondary data collection template was designed to collect data that would address the research questions. The source of the secondary data was identified and accuracy ascertained on the basis that this is data published by reputable government and private bodies. The secondary data used is annual statistics published by both the Central Bank of Kenya and the Kenya Bureau of Statistics plus daily stock index published by the Nairobi Stock Exchange. The statistics were collected from the websites of the three bodies mentioned previously.

The first process in this research was collection of the data using the methods outlined above. The data was needed on a monthly basis but some of the available data was on an accumulated basis or year to date basis. In such cases, the monthly figure was taken as the incremental figure in each period. To access the data in the websites, time was spent in a cyber cafe downloading the data from the internet.

3.6 Data Analysis Method

Cooper and Schindler (2001) define data analysis relates as the editing and summation of
data and applying statistical techniques to establish patterns and relationships. The data is prepared by coding it into a format that can be fed to the analytical tool to facilitate analysis. The tool used to analyze the data is Statistical Product and Service Solutions (SPSS). The output is presented through tables and figures.

The most ideal method to determine the relationship between the variables under study was inferential statistics and specifically regression analysis. Regression analysis is a statistical tool for the investigation of relationships between variables. It’s a tool that helps in ascertaining the causal effect of one variable upon another. Regression analysis was therefore used to determine if a relationship did exist and if so, to what extent. The process involved collecting data on the variables under study and employing regression to estimate the quantitative effect of the causal variables upon the variable that they influence. Regression analysis is used to determine the statistical significance of the estimated relationships i.e. the degree of confidence that the true relationship is close to the estimated relationship. The first stage of the regression process was to identify the dependent variable i.e. the variable we want to predict, and then carry out multiple regression analysis focusing on the explanatory variables i.e., the variables we are using as predictors. The relationship between the dependent variable and the explanatory variables was thus identified and presented in a model or formula.

Given that this research is looking at variables and their relationship to Stock returns, the multiple regression analysis used assumed the form of the following broad equation;

\[ Y = f(x_i) + k \]
\[ Y = \sigma_1 x_1 + \sigma_2 x_2 + \sigma_3 x_3 + k \]

Where;
\[ Y = \text{Stock returns} \]
\[ x_1 = \text{Interest rate} \]
\[ x_2 = \text{Budget deficits} \]
\[ x_3 = \text{Inflation} \]
\[ \sigma = \text{Coefficient of correlation} \]
k = Error term

The results were presented in form of graphs and tables.

3.7 Chapter summary
In summary, data on fiscal policy variables and Stock returns in Kenya is available from secondary sources. It was collected from the treasury, Central Bank of Kenya, Kenya bureau of statistics and the Nairobi stock exchange. The data survey covered a period of 5 years beginning Jan 2008 and ending Dec 2012. The data was collected on a monthly basis in order to have a large number of observations which can lead to a statistically valid conclusion. Part of the data is available in soft copy from the websites of the Central bank of Kenya and the Kenya bureau of statistics. This was downloaded from the internet. However, part of the data is available in hard copy from the libraries of the two organizations. This was sourced and keyed into excel worksheets. The data was then analyzed by use of regression analysis to determine if a relationship exists between fiscal policy and interest rates in Kenya. In the next chapter, the data collected and results of the regression will be presented. The data and results are presented in tables and graphs.
4.1 Introduction

This chapter presents the information processed from the data collected during the study on the relationship between budget deficit, interest rates and inflation on stock returns at the Nairobi Stock exchange. The chapter is set out as follows; 4.2 presents data trends and descriptive statistics, 4.3 Effects of the independent variable on the dependent variable and 4.4 is the summary and interpretation of findings.

4.2 Trends and descriptive statistics

The table below gives descriptive statistics for all the variables under study;

<table>
<thead>
<tr>
<th>Table 4.1 Descriptive statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Interest Rate</td>
</tr>
<tr>
<td>Inflation Rate</td>
</tr>
<tr>
<td>NSE 20 share index</td>
</tr>
<tr>
<td>Budget Deficit</td>
</tr>
</tbody>
</table>

4.2.1 NSE index

The NSE 20 share index is a measure of the performance of the Nairobi stock exchange which takes a geometric mean of share prices of the top twenty best performing stocks. The list of this top twenty best performing is usually held static for a period but updated after some years when value of the shares of another company exceed that of one of the companies included in the twenty share index. The NSE 20-share Index was introduced in 1964 and is therefore the oldest and most widely quoted measure of the performance of the Nairobi stock exchange. However, in February 2006, the NSE all share index (NASI) was introduced as well aimed at reflecting the total market value of all stocks traded on the NSE in any given
day as opposed to the price changes of the top 20 performers as captured by the NSE 20 share index.

In the period under study, the NSE 20 share index has moved from 5,167.18 in January 2008 to 4,133.02 in December 2012 with various highs and lows in-between. The mean return in that period was 3,870.4; minimum return was 2,556.97 and Maximum return was 5,289.51.

Below is a graphical presentation of the average annual movements in the NSE 20 share index for the period under study.

![Graph of Average Annual NSE 20 Share Index](image)

**Figure 4.1 NSE 20 share index**

**4.2.2 Budget deficits**

A budget deficit in Kenya has been steadily increasing in the period under review moving from Ksh 93 Billion in 2008 to Ksh 244 Billion in 2012. Below is a graphical presentation of annual budget deficits.
In the same period of time, monthly deficits have ranged from a high of Ksh -46 Billion to a surplus of Ksh 9.7 Billion with a mean monthly deficit of Ksh -13.8billion for the period under study.

4.2.3 Interest rates

In the period under study, the 91 day Tbill rate ranged from 6.95 in January 2008 to 8.3 in December 2012. The maximum monthly interest rate in that period was 20.56 while the minimum was 1.60. Below is descriptive statistics on the movement in interest rate. Below is a graphical representation of the annual average 91 day TB rate for each year under study.
4.2.4 Inflation rates
In the period under study, the month on month overall inflation rate has ranged from 7.93 in January 2008 to 3.20 in December 2012. The maximum month on month overall inflation rate in that period was 19.72 while the minimum was 3.18. Below is a graphical representation of the annual inflation for each year under study. The rate was on a downward trend from 2008 to 2010, went up in 2011 but dropped again in 2012.

![Inflation rates trend graph](image)

4.3 Regression analysis
The study conducted a cross-sectional analysis of the relationship between stock returns and budget deficit, interest rates and inflation over the period 2008–2012. Multiple regression analysis was used as the independent variables were found to also have an inter-relationship amongst them. By running multiple regression, the model was found to be a better predictor of the dependent variable than by analyzing each independent variable against the dependent variable on its own.

4.3.1 Stock Returns Analysis and Interpretations for Year 2008
Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in
the dependent variable (stock return) that is explained by all the three independent variables (budget deficit, interest rates and inflation).

**Table 4.2 ANOVA Statistics for stock returns in year 2008**

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Regression</td>
<td>3</td>
<td>983378.367</td>
<td>3.274</td>
<td>.080(a)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Residual</td>
<td>8</td>
<td>300331.047</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>11</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4.3 Coefficient of correlation for year 2008**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>12200.040</td>
<td>2886.987</td>
<td>-.833</td>
<td>-2.478</td>
</tr>
<tr>
<td>interestRate</td>
<td>-1114.473</td>
<td>449.706</td>
<td>.833</td>
<td>-2.478</td>
</tr>
<tr>
<td>inflationRate</td>
<td>64.611</td>
<td>75.544</td>
<td>.285</td>
<td>.855</td>
</tr>
<tr>
<td>T.Budget Deficit</td>
<td>-.0020541</td>
<td>.0134205</td>
<td>-.040</td>
<td>-.153</td>
</tr>
</tbody>
</table>

The data findings from stock return statistics were analyzed and the SPSS output presented in table 1 and 2 above. R at 0.694 is close to 1 meaning there are few outliers in the regression line. The regression line is a good test of fit. From the ANOVA statistics in table 1, the processed data, which are the population parameters, had a significance of 0.08% which shows that the data is ideal for making a conclusion on the population’s parameter. The F critical at 5% level of significance was 3.274. The coefficient table in table 2 above was used in coming up with the model below:

**Stock returns = 12200.04 – 1114.47 Interest rate + 64.61 Inflation -0.00 Budget deficit +e**

According to the model, interest rates and to a minor extent budget deficits are negatively
correlated to stock returns while inflation is positively correlated with stock returns. From the model, taking all factors (budget deficit, interest rates and inflation) constant at zero, stock returns will be 122000.04. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in interest rates will lead to a 1114.47 decrease in stock returns. A unit increase in Inflation will lead to a 64.61 increase in stock returns while a unit increase in budget deficit will lead to a zero impact in stock returns.

4.3.2 Stock Returns Analysis and Interpretations for Year 2009

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by all the three independent variables (budget deficit, interest rates and inflation).

Table 4.4 ANOVA Statistics for stock returns in year 2009

<table>
<thead>
<tr>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>454590.14</td>
<td>4</td>
<td>151530.048</td>
<td>5.770</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>210105.11</td>
<td>8</td>
<td>26263.140</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>664695.26</td>
<td>11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.5 Coefficients of correlation for year 2009

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>631.689</td>
<td>1230.623</td>
<td>.513</td>
</tr>
<tr>
<td></td>
<td>interestRate</td>
<td>447.705</td>
<td>186.356</td>
<td>.696</td>
</tr>
<tr>
<td></td>
<td>inflationRate</td>
<td>-84.973</td>
<td>29.169</td>
<td>-.849</td>
</tr>
<tr>
<td></td>
<td>T. Budget Deficit</td>
<td>-.0002809</td>
<td>.0045931</td>
<td>-.015</td>
</tr>
</tbody>
</table>
The data findings from stock return statistics were analyzed and the SPSS output presented in table 3 and 4 above. R at 0.735 is close to 1 meaning there are few outliers in the regression line. The regression line is a good test of fit. From the ANOVA statistics in table 3, the processed data, which are the population parameters, had a significance of 0.021% which shows that the data is ideal for making a conclusion on the population’s parameter. The F at 5% level of significance was 5.77. Since F calculated is greater than the F critical (value = 4.07), this shows that the overall model was significant as the obtained F-ratio is likely to occur by chance with a p<0.05. The coefficient table in table 4 above was used in coming up with the model below:

**Stock returns = 631.69 + 447.71 Interest rates - 84.97 Inflation -0.00 Budget deficits +e**

According to the model, interest rate was positively correlated with stock returns while inflation and budget deficits were negatively correlated with stock returns. From the model, taking all factors (budget deficit, interest rates and inflation) constant at zero, stock returns will be 631.69. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in Interest rates will lead to a 447.71 increase in stock returns. A unit increase in Inflation will lead to 84.97 decreases in stock returns while a unit increase in Budget deficit will lead to a zero impact on stock returns.

### 4.3.3 Stock Returns Analysis and Interpretations for Year 2010

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by all the three independent variables (budget deficit, interest rates and inflation).

#### Table 4.6 ANOVA Statistics for stock returns in year 2010

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.960(a)</td>
<td>.921</td>
<td>.892</td>
<td>126.55111</td>
</tr>
</tbody>
</table>
The data findings from stock return statistics were analyzed and the SPSS output presented in table 5 and 6 above. R at 0.96 is close to 1, meaning there are few outliers in the regression line. The regression line is a good test of fit.

From the ANOVA statistics in table 5, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population’s parameter. The F critical at 5% level of significance was 51.664. Since F calculated is greater than the F critical (value = 4.07), the obtained F-ratio is likely to occur by chance with a p<0.05. The coefficient table in table 5 above was used in coming up with the model below:

**Stock returns = 5194.15 - 133.84 Interest rates - 122.59 Inflation -0.00 Budget deficit +e**

According to the model, all three variables are negatively correlated with stock returns. From the model, taking all factors (budget deficit, interest rates and inflation) constant at zero, stock returns will be 5194.15. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in Interest rates will lead to a 133.84 decrease in stock returns. A unit increase in Inflation will lead to a 122.59 decrease in stock returns; a unit increase in Budget deficit will lead to a zero impact on stock returns.
4.3.4 Stock Returns Analysis and Interpretations for Year 2011

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by all the three independent variables (budget deficit, interest rates and inflation).

Table 4.8 ANOVA Statistics for stock returns in year 2011

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>1886424.3</td>
<td>3</td>
<td>628808.110</td>
<td>26.011</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>193401.31</td>
<td>8</td>
<td>24175.164</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2079825.6</td>
<td>11</td>
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Table 4.9 Coefficients of correlation for year 2011

<table>
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<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>4729.194</td>
<td>206.155</td>
<td>22.940</td>
</tr>
<tr>
<td></td>
<td>interestRate</td>
<td>-37.778</td>
<td>23.929</td>
<td>-.489</td>
</tr>
<tr>
<td></td>
<td>inflationRate</td>
<td>-46.572</td>
<td>25.282</td>
<td>-.520</td>
</tr>
<tr>
<td></td>
<td>T.Budget Deficit</td>
<td>-.0025559</td>
<td>.0042413</td>
<td>-.081</td>
</tr>
</tbody>
</table>

The data findings from stock return statistics were analyzed and the SPSS output presented in table 7 and 8 above. R at 0.953 is close to 1, meaning there are few outliers in the regression line. The regression line is a good test of fit. From the ANOVA statistics in table 7, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population’s parameter. The F critical at 5% level of significance was 26.011. Since F calculated is greater than the F critical (value = 4.07), this shows that the overall model was significant. The coefficient table in table 5 above
was used in coming up with the model below:

**Stock returns = 4729.19 - 37.78 Interest rate – 46.57 Inflation - 0.00 Budget Deficit +e**

According to the model, all variables were negatively correlated with stock returns. From the model, taking all factors (budget deficit, interest rates and inflation) constant at zero, stock returns will be 4729.19. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in interest rates will lead to a 37.78 decrease in stock returns. A unit increase in Inflation will lead to a 46.57 decrease in stock returns; a unit increase in Budget deficits will lead to a zero impact on stock returns.

**4.3.5 Stock Returns Analysis and Interpretations for Year 2012**

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (stock return) that is explained by all the three independent variables (budget deficit, interest rates and inflation).

**Table 4.10 ANOVA Statistics for stock returns in year 2012**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
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<tr>
<td>1</td>
<td>.991(a)</td>
<td>.982</td>
<td>.975</td>
<td>52.71588</td>
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</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
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<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td>1 Regression</td>
<td>1196410.0 32</td>
<td>3</td>
<td>398803.344</td>
<td>139.754</td>
<td>.000(a)</td>
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<tr>
<td>Residual</td>
<td>22828.804</td>
<td>8</td>
<td>2853.601</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1219238.8 36</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
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Table 4.11 Coefficients of correlation for year 2012

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>B</td>
</tr>
<tr>
<td>1 (Constant)</td>
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<td>58.025</td>
<td>74.677</td>
<td>.000</td>
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<td>interestRate</td>
<td>-6.862</td>
<td>11.047</td>
<td>-.094</td>
<td>-.621</td>
</tr>
<tr>
<td>inflationRate</td>
<td>-55.192</td>
<td>9.001</td>
<td>-.903</td>
<td>-6.132</td>
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<tr>
<td>T.Budget Deficit</td>
<td>0.008536</td>
<td>0.0015666</td>
<td>0.032</td>
<td>0.545</td>
</tr>
</tbody>
</table>

The data findings from stock return statistics were analyzed and the SPSS output presented in table 9 and 10 above. R at 0.991 is close to 1, meaning there are few outliers in the regression line. From the ANOVA statistics in table 9, the processed data, which are the population parameters, had a significance of 0.0% which shows that the data is ideal for making a conclusion on the population’s parameter. The F critical at 5% level of significance was 139.754. Since F calculated is greater than the F critical (value = 4.07), this shows that the overall model was significant. The coefficient table in table 10 above was used in coming up with the model below:

**Stock returns = 4333.13 - 6.86 Interest rate - 55.19 Inflation + 0.00 Budget deficit + e**

According to the model, only Budget deficit was positively correlated with stock returns while interest rates and inflation were negatively correlated with stock returns. From the model, taking all factors (budget deficit, interest rates and inflation) constant at zero, stock returns will be 4333.13. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in interest rates will lead to a 6.86 decrease in stock returns. A unit increase in Inflation will lead to a 55.19 decrease in stock returns; a unit increase in budget deficit will lead to a zero impact in stock returns. This infers that interest rate contributed more to the stock returns of NSE.

4.4 Effect of Budget Deficit on stock market returns

The regression analysis done across the five years has shown that in 2008 a unit increase in budget deficit led to a zero impact 0.00 decrease in stock returns. In 2009 a unit increase in Budget deficit led to a 0.00 decrease in stock returns. In 2010 a unit increase in Budget deficit led to a 0.00 decrease in stock returns. In 2011 a unit increase in Budget deficits led to
a 0.00 decrease in stock returns while in 2012 a unit increase in budget deficit led to a 0.00 increase in stock returns. Except in 2012, the relationship is inverse though insignificant with zero impact noted across the years.

4.5 Effect of Interest Rates on Stock market returns

The regression analysis done across the five years has shown that in 2008, a unit increase in interest rates led to a 1114.47 decrease in stock returns. In 2009 a unit increase in Interest rates led to a 447.71 increase in stock returns. In 2010 a unit increase in Interest rates led to a 133.84 decrease in stock returns. In 2011 a unit increase in interest rates led to a 37.78 decrease in stock returns while in 2012, a unit increase in interest rates lead to a 6.86 decrease in stock returns. Except in 2009, there is a significant inverse relationship between interest rates and stock returns in all the other years.

4.6 Effect of Inflation on Stock Market Returns

The regression analysis done across the five years has shown that in 2008, a unit increase in Inflation led to a 64.61 increase in stock returns. In 2009 a unit increase in Inflation led to 84.97 decreases in stock returns. In 2010 a unit increase in Inflation led to a 122.59 decrease in stock returns. In 2011 a unit increase in Inflation led to a 46.57 decrease in stock returns while in 2012, unit increase in Inflation will lead to a 55.19 decrease in stock returns. Except in 2008, there is a significant inverse relationship between inflation and stock returns in all the other years.

4.7 Summary

This chapter detailed the results and findings of how interest rates, inflation and budget deficits affect stock returns at the Nairobi stock exchange as measured by the 20 share index. The next chapter discusses these findings and provides a conclusion to the study.
CHAPTER 5
5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter starts with a summary of the purpose and major findings of this study followed by a discussion of the findings and lastly are conclusion and recommendations on areas of further study.

5.2 Summary

The purpose of the study was to evaluate the effect of macro-economic factors on stock returns at the Nairobi stock exchange. The study specifically sought to establish the relationship between public deficit and stock returns at the Nairobi stock exchange, establish the relationship between interest rates and stock returns at the Nairobi stock exchange and finally determine the relationship between inflation and stock returns at the Nairobi stock exchange. The NSE 20 share index was used as the measure of stock returns for the purposes of this study.

The research design adopted was a cross-sectional analysis that studied data for a period of five years to establish if a relationship exists between the independent variables and the dependent variables. A cross-sectional study approach was used because secondary data was available and the approach consumes less time and is cost effective. The study used secondary data for five years making 60 observations for each variable and a secondary data collection template was used to collect the data. Data on budget deficits and interest rates was sourced from the website of the central bank of Kenya; data on inflation was sourced from the Kenya bureau of statistics while data on the NSE 20 share index was sourced from the Nairobi stock exchange. The data was then coded and fed into SSPS to facilitate analysis. The data was subjected to sensitivity analysis using regression to arrive at the results. Regression analysis is statistical tool for investigating the relation between variables and was used to determine if a relationship existed between the independent variables and the dependent variables.
The results indicate that there is an insignificant relationship between budget deficits and stock returns at the Nairobi stock exchange. In 2008 a unit increase in budget deficit had a Zero impact on stock returns. In 2009 a unit increase in Budget deficit had a Zero impact on stock returns. In 2010 a unit increase in Budget deficit had a Zero impact on stock returns. In 2011 a unit increase in Budget had a Zero impact on stock returns while in 2012 a unit increase in budget deficit also had a Zero impact on stock returns. The relationship is therefore insignificant across all the years.

The results also show that of all variables tested interest rates had the most significant relationship with stock returns at the Nairobi stock exchange. An increase in interest rates is found to have a negative impact on stock returns at the Nairobi stock exchange. In 2008, a unit increase in interest rates led to a 1114.47 decrease in stock returns. In 2009 a unit increase in Interest rates led to a 447.70 increase in stock returns. In 2010 a unit increase in Interest rates led to a 133.84 decrease in stock returns. In 2011 a unit increase in interest rates led to a 37.78 decrease in stock returns while in 2012, a unit increase in interest rates lead to a 6.862 decrease in stock returns. Except in 2009, there is a significant inverse relationship between interest rates and stock returns in all the other years.

The results also show that inflation has a negative relationship with stock returns at the Nairobi stock exchange. In 2008, a unit increase in Inflation led to a 64.61 increase in stock returns. In 2009 a unit increase in Inflation led to 84.97 decreases in stock returns. In 2010 a unit increase in Inflation led to a 122.59 decrease in stock returns. In 2011 a unit increase in Inflation led to a 46.57 decreases in stock returns while in 2012, unit increase in Inflation will lead to a 55.19 decrease in stock returns. Except in 2008, there is a significant inverse relationship between inflation and stock returns in all the other years.
5.3 Discussion

5.3.1 The relationship between public deficit and stock returns at the Nairobi stock exchange

The study found no significant relationship between budget deficits and stock returns at the Nairobi stock exchange. This is true across all the five years that were analyzed. This finding is in line with the Stock market Efficiency hypothesis theory which states that stock prices fully reflect all past and current publicly available information. This means that there should be no statistically significant relationships between fiscal policy actions like deficits, monetary policy actions like money growth on one hand, and stock returns on the other hand. Stock prices are expected to fully incorporate all available information on policy changes (Laopodis, 2007).

Although the results are in line with the stock market efficiency theory, they contrast the findings of other previous studies done in other markets. For example, Laopodis, 2007, examined the extent to which fiscal policy actions affect the stock market’s behavior in the United States of America for the period 1968–2005. He found that past budget deficits negatively affect current stock returns implying that the market is inefficient with respect to information about future fiscal policy actions. He interpreted this to mean that market participants do not generally believe that deficits could adversely impact the stock market hence pay little attention to budget deficits. Instead, the market seems to consider monetary policy actions as more important. Lee (2002) re-examined Darrat’s 1990 findings for Canada and found that the country’s stock market is efficient with respect to fiscal policy.

Another study that is in contrast with these findings is Faiza et al, 2012, who posits that a huge budget deficit currently is a pointer to future raise in inflation or increase in taxes. Future inflation rate anticipation may either increase or decrease the firm’s value. Also inflationary expectations affect nominal interest rates and this may cause stock prices to go up because lower rates mean a higher present value of future earnings. On the other hand, lower inflationary expectations may lower expected future earnings leading to a drop in stock prices.
5.3.2 The relationship between interest rates and stock returns at the Nairobi stock exchange

The findings of this study indicate that of all variables tested interest rates had the most significant relationship with stock returns at the Nairobi stock exchange. An increase in interest rates is found to have a negative impact on stock returns at the Nairobi stock exchange. These findings are in line with available literature and previous studies done on the subject in other markets. The reasons why interest rates have negative impact on stock returns are well documented in available literature and previous studies. Interest rate is a key macroeconomic variable in an economy and is directly linked to economic growth. A wise investor aims at investing in an efficient market where there is no possibility of making super profits through arbitrage. When the rate of interest paid by banks to depositors increases, people normally switch their capital from share market to interest earning deposits placed with banks. This leads to decrease in the demand of shares and thereby decrease the price of shares and vice versa. Also when the rate of interest paid by banks to depositor’s increases, the lending interest rate also increases leading to a slowdown in investments in the economy which also causes further drop in share prices. The vice versa is also true hence in theory there is an inverse relationship between share price and interest rate (Uddin and Alam, 2007).

Other studies with similar findings to this study include Laopodis (2007), Jefferis and Okeahalam (2000), Harasty and Roulet (2000) and Arango (2002) among others.

In all these previous studies, it was generally found that not only do interest rates have a significant negative relationship with Share Price but also that changes in interest rates have a significant negative relationship with changes in share prices. Hence the findings of this study are in line with the previous findings and available literature.
5.3.3 The relationship between inflation and stock returns at the Nairobi stock exchange

The results of this study show that inflation has a negative relationship with stock returns at the Nairobi stock exchange. The analysis indicates that there is an inverse relationship with stock returns in four out of the five years that were analyzed. A unit increase in inflation led to a significant decrease in stock returns but the relationship was not as strong as that observed with interest rates. These findings are in line with some of the previous findings on this subject but contrast with the classic Fisher theory of 1930 which predicted that there is a positive relationship between expected inflation and nominal asset returns. There exists a body of literature which seems to support the Fisher classic theory. Brandt and Wang (2003) argue that risk aversion is time-varying. They thus suggest that inflation makes investors more risk averse which in turn drives up equity risk premiums. This would therefore suggest that increase in inflation will result in increase in stock returns as postulated by Fisher.

Previous studies which support this position include Rapach (2002) who studies the long-run real stock price response to a permanent inflation shock for 16 industrialized countries and finds them to be zero or positive. Also Choudhry (2001) studies the relationship between current stock returns and current inflation in four high inflation countries (Argentina, Chile, Mexico and Venezuela) and finds a positive relationship. In another study for 10 Emerging Stock Markets (ESM), Spyrou (2004) finds a positive relationship between the two variables.

But there are findings from various other studies which contrast this theory and are in line with the findings of this study. Gallagher and Taylor (2002), find evidence that stock returns are negatively affected by both expected and unexpected inflation. Also Omran and Pointon (2001) find a negative relationship between the two variables for Egypt. Apergis and Eleftheriou (2002) find a negative relationship for Greece but Spyrou (2001) finds a negative relationship between inflation and stock returns in Greece only for the period until 1995. For the period 1196 to 2000 he finds no statistically significant relationship.
Given this mixed findings in recent studies, it’s obvious that the question of the relationship between inflation and stock returns is still wide open and there is need for further research on the issue.

5.4 Conclusion
5.4.1 The relationship between public deficit and stock returns at the Nairobi stock exchange
This study sought to determine the relationship between public deficit and stock returns at the Nairobi stock exchange. The study found no significant relationship between budget deficits and stock returns at the Nairobi stock exchange. This is true across all the five years that were analyzed. This implies that information on budget deficits is already factored into the prices of stocks.

5.4.2 The relationship between interest rates and stock returns at the Nairobi stock exchange
The study also sought to establish the relationship between interest rates and stock returns at the Nairobi stock exchange. The findings indicate that there is an inverse relationship with stock returns in four out of the five years that were analyzed. Hence increases in interest rates have a negative impact on stock returns at the Nairobi stock exchange.

5.4.3 The relationship between inflation and stock returns at the Nairobi stock exchange
Lastly this study sought to establish the relationship between inflation and stock returns at the Nairobi stock exchange. The analysis indicates that there is an inverse relationship with stock returns in four out of the five years that were analyzed. A unit increase in inflation led to a significant decrease in stock returns but the relationship was not as strong as that observed with interest rates. An increase in inflation will therefore tend to decrease stock returns at the Nairobi stock exchange.
5.5 Recommendations

5.5.1 Recommendations for improvement

5.5.1.1 The relationship between public deficit and stock returns at the Nairobi stock exchange

The results of this study indicate that there is no significant relationship between public deficits and stock returns at the Nairobi stock exchange. This implies that fiscal policy information is available to stakeholders and has already been factored into the stock prices at the Nairobi stock exchange. The regulatory authority and government should continue encouraging this state of affairs to ensure that there is no opportunity for earning abnormal returns by possession of information that is not available to the public. The government through relevant agencies should ensure that data on government finances and fiscal policy is disseminated in a timely and accurate manner to the investing public so that the market continues being efficient.

5.5.1.2 The relationship between interest rates and stock returns at the Nairobi stock exchange

The results of the study indicate that there is a negative relationship between interest rates and stock returns at the Nairobi stock exchange. The government should therefore pursue policies that lead to a reduction in interest rates so as to make it cheaper for firms to borrow capital and increase production in order to grow in size and profitability which will ultimately increase stock returns at the Nairobi stock exchange.

5.5.1.3 The relationship between inflation and stock returns at the Nairobi stock exchange

The results of the study indicate that there is a negative relationship between inflation rates and stock returns at the Nairobi stock exchange. The government should therefore pursue policies aimed at containing inflation to remove undesirable impacts of inflation on the economy. The negative relationship between inflation and stock returns implies that inflation affects growth in the economy and should therefore be controlled so that the country can attain its development objectives.
5.5.2 Recommendations for further research

The major recommendation on further studies from this study is that more research is needed to establish whether indeed the lack of a significant relationship between stock returns and fiscal deficits in Kenya is because the Kenya stock market is efficient in terms of information on fiscal policy actions or there are other reasons why fiscal deficits do not seem to matter. Also further research should be done on what other factors affect stock returns at the Nairobi stock exchange and the inter-relationships between the various factors impacting the performance of the Nairobi stock exchange. Future research can also be extended to look at more stocks in addition to those measured by the NSE 20 Share index.

This study also recommends further research on the relationship between inflation and stock returns as the findings from previous studies in the subject from different markets offer mixed results with some finding negative relationship like this study while others find a positive relationship.
REFERENCES


## APPENDICES

### Appendix 1 Data collection instrument

<table>
<thead>
<tr>
<th>Period</th>
<th>Budget Deficit</th>
<th>91 Day TB rate</th>
<th>Month on Month overall inflation rate</th>
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