

**EFFECT OF INFLATION ON STOCK MARKET RETURNS AT THE NAIROBI  
SECURITIES EXCHANGE**

**BY**


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## DECLARATION

I hereby declare that this research project is my original work. It has not previously been presented, published, or approved for award of a degree in any learning institution or university.

Signature  Date 11 November 2021

**Jane Obura Obiny D63/10912/2018**

This research project has been submitted for examination with my approval

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## **DEDICATION**

This work is a testimony of struggle and accomplishment; it is dedicated to everyone who has gone through the journey with me. The tremendous steps, knowledge, immense academic milestone, increase in the analytical skills and ability to solve problems using different mechanisms can only be attributed to family, friends and university. I promise to keep the academic light shining!

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Glory be to God

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>ARDL</b>	Autoregressive Distributed Lag model
<b>CAPM</b>	Capital Asset Pricing Model
<b>CBK</b>	Central Bank of Kenya
<b>CPI</b>	Consumer Price Index
<b>PPI</b>	Producer Price Index
<b>CMA</b>	Capital market authority
<b>GDP</b>	Gross Domestic Product
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NSE</b>	Nairobi securities exchange
<b>ROE</b>	Return on Equity
<b>ROI</b>	Return on Investment
<b>ROS</b>	Return on Sales
<b>SPSS</b>	Statistical package for social sciences

## ABSTRACT

Macroeconomic variables and policies can be harnessed to reinforce prosperity of the Kenyan economy. Empirically, firms cannot adjust production and output in the short run whereas consumers have more disposable income to spend. Prices adjust upwards to support increase in demand. A major shock in the economy for instance a natural disaster can affect availability of inputs and therefore impact production. The driving goal of the study is to investigate the effect of inflation on stock market returns of organization cited at the Nairobi Securities Exchange. A descriptive research design was prioritized in this assessment. The research sampled 19 companies from a population consists of the 66 firms that were listed in the NSE in December 2020. The sample consists of nineteen firms whose shares comprise of the NSE 20 index. The study relied on secondary sources of data. Monthly data on the Nairobi Securities Exchange's NSE 20-share index were collected. Moreover, SPSS was used to analyze the data collected. Regression analysis played pivotal part in examination of impact of explanatory variable on the explained variable. Tables were maximized to assess and coin the research findings. The diagnostic tests' outcomes showed that all variables had its VIF values  $VIF < 10$  and all its Tolerance values  $> 0.2$ . Thus implying that there was no multicollinearity existing between the Independent variables. The significance values in both the Kolmogorov-Smirnov in addition to Shapiro-Wilk test were less than the p value 0.05. This showed a normality distribution of data. This mandated the rejection of null hypothesis in striving towards a conclusive judgmental process. Durbin-Watson value obtained was 0.261 which is less than 2 thus lying within the normal range. From the comprehensive computation as stipulated R of 0.963 while R Square was 92.7%. This analysis posit that all the factors prioritized in this study amounted to 92.7% in deviating stock return. In summary, exchange rate, money supply, inflation CPI and interested rate represent 92.7% of all the contributors of deviation and variation in stock return. The study outcome stipulated that an addition of one unit of inflation CPI results in increment in stock market return by 0.3% if remnant variables are constantly maintained. A unit increment in the interest rates translates to 0.1% decrease in stock market returns whenever all variables are maintained constant. Additionally, an increase in money supply triggers 8.3% decrease in stock market returns if all factor are held constant. Furthermore, an addition of one unit of exchange rate translated to increase 50.4% increase in stock market return when all factors are kept constant. Moreover, the autonomous figures was 5.491. The research recommends the prudential policy formulation to protect against severe impact of inflation rate on the stock market return.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

(Bagehot 1873) asserts that stock markets are an important determinant of an economy. Countries with robust and well-developed economies tend to have sophisticated and efficient stock markets (King and Levine, 1993). The converse is true for developing countries. Stock markets have one main goal; to pull together savings from investors and allocate them efficiently to the most profitable channels/ firms (Falkeena et al, 1988). The stock market can therefore be considered as an “economic mirror” or pulse.

Stock market changes frequently foreshadow changes in macroeconomic variables, according to Fuentes (2010). Persistent price level changes progressively limit savings for investors as more funds are needed to acquire the same amount of goods. Consequently, firms have less funds available over time to invest in profit generating activities (Fama, 1981).

Increased inflation also causes investors to demand a much higher return to hedge their risk of loss (Fisher, 1930). Where the real value of money goes down, a higher premium will be needed to compensate the investor and mitigate loss in value of investment from price level changes. The higher cost to firms translates to higher cost of inputs that they subsequently push to the final consumer through price increases.

Researchers have noted that different markets tend to react differently to inflation. Sathyanarayana et al (2018) in their study noted that in India, Austria, Belgium, Canada, Chile, France and Ireland, an increase in inflation adversely impacted stock returns. Other markets, specifically Brazil, Indonesia, Japan, Mexico and Turkey, inflation moved in tandem with stock market returns. Boudokh et al (1994) also noted that different sectors of the economy tend to respond differently

to inflation. In their study, IT sector, real estate, oil, and energy sectors were less elastic to changes in inflation.

The Nairobi Securities Exchange (NSE) is Kenyan-based stock market that serves both local and foreign investors within the East African region. It performs a crucial role in fund deployment and allocation as a means of driving economic growth in Kenya (Aliyu, 2011). This study will therefore analyze how NSE stock returns are influenced by inflation. Findings from this research will shed light on how macroeconomic variables and policies can be harnessed to promote progression and transformation of the Kenyan economy.

### **1.1.1 Inflation**

Inflation can be described as the persistent increment in prices of commodities within a set period of time (Ariss, 2012). It erodes purchasing power of consumers as they need more money over time to acquire the similar basket of products (goods as well as services).

Inflation is sometimes characterized by a rapid increase in money supply within an economy (IMF, 2020). Typically, firms cannot adjust production and output in the short run whereas consumers have more disposable income to spend. Prices adjust upwards to support increase in demand. A major shock in the economy for instance a natural disaster can affect availability of inputs and therefore impact production. Increased prices are passed on to the consumer as a result of higher production expenses. In addition, the supply deficit causes prices to rise.

The true impact of inflation is an intense topic of debate among researchers. There is also a lack of consensus on the optimal way to measure it. According to the US Bureau of Labor Statistics, the CPI and the PPI are recognized inflation indicators (2021). Both metrics attempt to quantify price level movements in the wholesale price of commodities to both consumers and producers, respectively. Core inflation can also be used to measure inflation where the basket of goods and services excludes food and energy sector commodities due to the volatility in their prices in the

short run. Further, these commodities are core items and necessities. Their consumption is unaffected by changes in prices.

Governments through fiscal and monetary policies are able to tweak macroeconomic conditions to boost growth and development (Friedman, 1967). Where such policies are weak or ill-timed, economies may experience stagflation (inflation under a recession) or hyperinflation (more than 50% increase in price of commodities within a given period). Both types of inflation are difficult to arrest and are not sensitive to policy changes aimed at jump starting the economy.

### **1.1.2 Stock Market Returns**

This exemplify on the consideration investors receive for investing in the stock market. When the market value of equities rises, investors receive dividends or capital gains. (Mugambi and Oketch, 2016). In efficient markets the stock prices are reflective of all added information in the market Fama (1979). Governments and investors can therefore use the stock market as an index for prioritizing and spearheading investment strategies (Wang, 2012).

Mogire (2014) notes that investors have a number of ways of assessing stock market returns. Historical analysis of stock prices can give useful insight on different stock patterns and how the stock prices change with changes in the economic cycle. Returns can also be assessed using fundamental analysis. An assessment of the firm's underlying value, cashflows, management quality, industry trends, and other financial parameters can provide valuable insights, resulting in higher results. According to Economy Watch (2010), different investors derive different returns from the stock market based on their risk appetite and the quality of their stock market analysis. Stock returns are hardly homogenous and involve a willingness to speculate and take on risk.

Mun et al (2008) noted that stock indices can be used to predict future economic conditions or vice versa. Significant drops in stock prices always preceded a recession whereas rising stock prices signified an economic turn of expansion. For instance, the recession of 2009 resulted in a significant decline in stock values, as measured by the Dow Jones as stipulated by Fuentes (2010).

Stock market returns are cornerstone for futuristic prediction and sound judgmental. They incorporate assumptions on future cashflows, discount and growth rates. They are therefore more accurate than price volatility, when projecting investment and production. Numerous studies have been accomplished. Fama (1981) illustrated the critical role of stock returns in the present and future market forecasting. Fischer and Merton (1984) emphasize the instrumental power of stock market returns in defining, forecasting and blueprinting output and investment.

### **1.1.3 Effect of Inflation on Stock Market Return**

According to Fischer (1930) the monetary and real components of the economy were self-contained. Where inflation rose, consumers and investors shifted from monetary assets to real assets to hedge against inflation. This then served to increase demand on real assets and their expected returns.

Real-world empirical data, on the other hand, tends to refute Fisher's Hypothesis. Other factors enter the equation, complicating the situation. Fama (1981) coins the correlation amid inflation verse stock returns as a subjective of economic and monetary policy. It stated that fluctuations in inflation and monetary policy actions by policymakers affect the market. Because of predicted changes in interest rates, economic activity, and dividends, such shifts may cause investor fear and a drop in stock values. Inflation and stock market returns have an inverse relationship.

The problem can be better understood by looking at previous stock market performances. Coleman and Tettey (2008) stipulated an inverse correlation between inflation and stock market returns in

their analysis of the Ghanaian stock market. Investors moved their spending from equities to consumables when inflation rose, owing to the decreasing utility of disposable money. As a result, when inflation rose, stock market returns fell.

Munene (2007) noted that even though stock returns and expected inflation had an inverse relationship, actual inflation moved in tandem with stock prices. It can be noted that the timing of the economic cycle, the monetary and fiscal policy and investor interpretation of economic variables and their biases greatly impact inflation and stock prices.

#### **1.1.4 Nairobi Securities Exchange**

Nairobi Stock Exchange (NSE) was founded in 1954 as a stockbrokers' association for Kenya's European community. It was formed with the approval of the London Stock Exchange in 1953. NSE became a private limited business in 1991 and switched to a floor-based open outcry method (NSE, 2020).

The NSE deals in the trading of equity and bond securities for both local and international investors. In 2006, the NSE adopted the Automated Trading System (ATS) for trading of equities, corporate bonds and treasury bonds. In 2014, it became the 2<sup>nd</sup> African exchange to self-list its own shares.

According to (Muituri, 2014) stockbrokers, dealers, and investment banks make up the NSE's membership. It is the largest securities exchange in East Africa and also cross lists securities from the Ugandan and Tanzanian Stock Exchanges (Njuguna, 2015). The NSE has four key market segments (Onundu, 2016).

In 2020 and due to the COVID pandemic, equities turnover decreased by 3% to 148 billion. Foreign investor investment also decreased by 4.25% and bond turnover increased by 5.9% to 691 billion. The NSE 20 share index traded at 1,868 points from 2,654 in 2019. Through their Ibuka Programme, the NSE has seen at least 27 firms enroll for training and development on the listing



process with at least one new firm entering the GEMS market segment in 2020 (NSE, 2020). There are currently over 60 companies trading their shares at the NSE (Mogire, 2014).

## **1.2 Research Problem**

High inflation is always synonymous with lower growth and financial crisis (IMF, 2001). Adrangi et al (2012) in their study of the Brazilian market characterized inflation as a real threat to emerging markets. Rising prices in emerging economies like Kenya tend to trigger reduction in investor confidence, lower incomes and a decline in financial and real assets (World Bank, 2018). Where larger parts of the population are disproportionately poor, inflation translates into limited investment in stock markets because more money is needed to buffer against the rising price of commodities. Consequently, government policies are central to inflation management. Greater trade, supply chain integration, market stability and central bank transparency have been associated with lower inflation (World Bank, 2018)

Inflation can simply be described as an erosion in purchasing power (Uwubanmwun, 2015). Where price levels change, a ripple effect is experienced in the economy both in the short-run and longevity. Jalil (2011) noted that a rising inflation tends to be followed by a rise in the money supply of an economy. Additionally, Imbuga (2012) in her study of the Kenyan banking sector returns noted that investors and lenders demand for a higher inflation premium to offset the effects of reduction in the real value of money. An increased premium translated into higher input costs for firms, higher prices to consumers and overall lower stock market returns. Researchers have observed that the association amid stock returns as well as inflation isn't unidirectional or isolated. GDP, money supply, interest rates and forex rates also contribute towards inflation and stock returns either directly or indirectly (Onundu, 2016).

Boudoukh and Richardson (1993) in their UK and US study noted that short term nominal stock returns and inflation were uncorrelated while the long run nominal stock returns supported the Fisher Hypothesis. Linter (1975), Fama (1981), Ritter and Warr (2002), Sharpe (2002) on the other hand observed an inverse correlation amid the variables, suggesting that whenever inflation increased, equity returns dropped and vice versa. Peace and Roley (1985) stipulated that two variables were not correlated in anyway. The same outcomes were expounded by Hardouvelis (1988).

In Sub-Saharan Africa, there is limited research on stock market returns and inflation. Ogum et al (2006) applied EGARCH models to stock market returns in Kenya and Nigeria. Pascetto (1998) investigated the effect of volatility on emerging markets in Africa. Uwubanmwen (2015) researched on the consequential influence of inflation on stock prices in Nigerian context. Frimpong et al (2006) also performed a GARCH analysis on the Ghanaian stock exchange.

Locally, Barasa (2014) characterized the relationship between market performance and inflation as inverse and insignificant. He noted that the general election had a much bigger impact on the variables. Stock performance, inflation, supply of money within the economy and per capita GDP declined pre, during and post the electioneering period. Munene (2007) in his study noted that stock returns and expected inflation had an inverse relationship. On the other hand actual inflation moved in tandem with market performance.

A critical research gap exists for the following reasons: The bulk of existing research on inflation and stock returns have been focused on developed countries (World Bank, 2018). The findings while providing useful insights, cannot be superimposed on emerging economies like Kenya. Further, the wide range of conflicting empirical findings do not give a clear indication on the nature and directional correlation linking inflation and stock market returns. Economic cycles

and stock markets are very dynamic therefore hypothesis and conclusions adopted by earlier studies like Fisher (1930), Fama (1981), Linter (1975), Sharpe (2002) may have been obsolesced by time. Locally, existing assessments have concentrated on the impact of other macroeconomic predictors such as interest rates, (Kimani and Mutuku, 2013) or sectoral analyses (Imbuga, 2012), (Mwai, 2013). From the review that has been comprehensively looked in to, it paramount to posit that research done in foreign countries though significant, have portrayed contextual gaps due to varying geographical location and commercial market. Additionally, local studies have opened debate on methodological gaps and conceptual gaps. This is due to controversial and puzzling findings. The above factors highlight the gaps necessitating study which target to exemplify and answer; what is the effect of inflation on stock market returns at the Nairobi Securities Exchange?

### **1.3 Research Objective**

To examine the effect of inflation on stock market returns of companies listed at the Nairobi Securities Exchange.

### **1.4 Value of the Study**

This research will boost the investors and other stock market players in the determination the impact of inflation on their investments. This will assist them in making better investment decisions that incorporate changes in economic policy and macroeconomic variables. Optimal investment strategies and market positioning can therefore be built around findings from the research.

Policy makers, financial experts and governments can make use of the research findings to shape economic policy in a way that promotes growth and development within the country. Where governments can ascertain the optimum levels of inflation ideal for economic growth monetary and fiscal policy can be harnessed to increase output, determine government spending, and control

money supply for enhanced economic growth.

The study is also a contribution to the existing body of knowledge and will serve other researchers and academicians in advancement of new research and testing of new or existing theories on the variables of interest.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

The chapter critically analyzes theories and existing studies. The theories have crucial association with inflation and stock market returns thereby enhancing the description of cornerstone assumptions, criticisms and relevance. It delves into the equity market returns determinants, empirical studies conducted by other researchers and the conceptual framework guiding the research. The chapter will then highlight the gap the researcher is intending to fill and other topics for exploration not covered in this study.

#### **2.1 Theoretical Review**

The review involves a critical analysis of the theories forming the foundation of this research. Fisher's Hypothesis, Proxy Hypothesis, EMH and Inflation illusion hypothesis are some of the concepts covered.

##### **2.1.1 Fisher's Hypothesis**

Irving Fisher (1930) demonstrated how interest rates impact inflation in his study. He postulated that investors accepted nominal returns that had been adjusted for anticipated inflation. Supposing the nominal return on an investment were 10%, he reasoned that a 2% inflation premium would imply that the actual real growth for investors would be 8%. In his study, nominal returns always adjusted to reflect any changes in inflation therefore hedging the investor from loss of value due to price level changes.

Additionally, where an economy experienced a rise in inflation, investors tended to shift from monetary to real assets as they were more stable. Because stock returns presented investor claims to underlying real assets, they were insulated from adverse changes in inflation (Mpho, 2016).

Tsong and Lee (2009) used the quantile cointegration methodology proposed by Xiao to provide explanations for the Fisher effect's empirical failure in the presence of economic shocks (2009). The study examined 6 OECD economies from 1957 to 2012 and found that nominal rates tend to move in a lockstep pattern. Pelaez (1995) sought to determine an equilibrium relationship between actual and expected inflation over the long run in his contribution. Using Treasury bill data from 1959 to 1993, the study examined cointegration between the variables.

Fisher's Hypothesis is not without its criticisms. Graham (1988) noted that in the real world, the Fisher's theory did not entirely hold true. Fisher's propositions while theoretically appealing did not explain actual interest rate movements. Further empirical studies conducted noted that interest rates were not sensitive to inflation rate changes. Real asset yields tended to fall for every increase in inflation.

Ghazali and Ramlee (2003) examined the Fisher effect in G7 countries from 1974 to 1996. The study established that in the long run, interest rates were not related to inflation rates. Coppock & Poitras (2000) added to the existing body of knowledge by demonstrating that interest rates were more impacted by liquidity premium adjustments. They therefore did not adapt fully to inflation.

It is worth noting that accommodating expected income growth when regressing inflation proxies and stocks indicated that inflation and market returns were positively correlated. This was demonstrated by Fama (1981). This theory will help ascertain whether stock prices move in tandem with inflation at the NSE and whether the Fisher hypothesis holds.

### **2.1.2 Proxy Hypothesis**

This theory was developed by Fama (1981). He noted that inflation had a direct link with real economic activity which inadvertently affected the stock market returns. Where inflation rises, there is a reduction in real economic activity due to price level changes. This has a ripple effect towards firms whose profits are affected by the reduction and decreased demand. As a result of

the economy contracting, stock prices decline. As a result of his theory, it is clear that there is no express correlation between inflation and stock returns; rather, the correlation is derived via real economic activity and inflation.

Stulz (1986), Marshal (1992) all predicted that stocks fail to provide a hedge contrariwise to inflation, particularly whenever the inflation is influenced by non-monetary variables. Money is treated as a transaction asset in these models, and its value is determined concurrently with the values of other assets, such as stocks. Empirically, the expectations of greater inflation deplete wealth by diminishing the purchasing power (PP) of money balances carried forward in time. As a result, expected real returns on stocks are reduced. Critics of Fama's theory have noted that even though the conception of the theory is sound, it is incomplete and fails to incorporate other stages of the economic cycle in its analysis. Empirical studies support Fama's hypothesis only in a declining economy. Hiraki (1985) notes that Fama's assertions are consistent with empirical studies in US and Japan as well as other industrialized countries.

Lee (1992) and Balduzzi (1995) note that this relationship cannot be completely explained and is incomplete without incorporating other variables such as interest rates and taxes which account for a large fraction of the negative correlation.

This theory assists in ascertaining the linkages between inflation and other macroeconomic variables and the residual impact this has on stock markets. It also assists policy makers and governments to tailor policies relative to the economic conditions and the prevailing economic cycle.

### **2.1.3 Inflation Illusion Hypothesis**

Investors, according to Modigliani and Cohn (1979), are susceptible to cognitive bias. Investors frequently make the mistake of conflating real purchasing power with money's nominal value. They argued in their seminal paper, "Inflation, Rational Valuation, and the Market," that investors

are expected to capitalize and reap from profit adjustment in the event of real rate of return but regardless of whether nominal interest rates changed.

Modigliani & Cohn (1979) observed that equity investors misunderstood the effect of inflation on nominal growth rates and extrapolated past rates of return even when changes were observed in inflation. This meant that stocks were undervalued during periods of high inflation and overvalued during periods of reduced inflation. By the way, this bias did not exist in the bond market. Participants in the bond market reacted to changes in inflation by adjusting nominal interest rates.

Campbell and Vuolteenaho (2004) note some inconsistencies with this theory. In their study, “inflation illusion and stock prices” they noted that pre-war stock prices moved in tandem with inflation. They attributed the higher returns in the 1930s and 1940s measured by dividend price ratios to the cross-sectional equity risk premium. During the rise of inflation in the late 30s and 40s, the negative influence on stock prices was mitigated and over-compensated by the declining risk premiums.

According to Shafir et al (1997) most economists shun the idea that investors are subject to money illusion. This is because it contradicts the maximizing paradigm. It is also too simplistic an explanation to account for the given phenomenon. Other contributing factors such as government and taxes contributed to this observation. Shafir also noted that money illusion causes a sense of price stickiness. Even with increase in inflation, prices are slow to change thus causing the inverse association linking stocks verses inflation.

This theory is particularly relevant to the research. Stock returns are sensitive to macroeconomic changes. Where investors place their investment in the stock market, it is critical that they have a good understanding of how inflation shapes stock returns and overall economic health of a country.



Governments can then utilize this information in setting appropriate monetary and fiscal policies that promote economic growth and development.

#### **2.1.4 Efficient Market Hypothesis**

It is also referred to as the efficient market theory. It posits that share prices adjust to incorporate all available information in the market. Investors can therefore infer that in efficient markets, there are no over-valued or undervalued stocks and it is impossible to outperform the market when selecting investments. Eugene Fama (1970) developed the theory where he explained the several types of capital markets.

Markets that have weak-form efficiency tend to incorporate all past information in their share prices. It is therefore impossible to beat the market using analysis of past stock prices, historical trends, or stock patterns. Future stock prices mirror a random walk and are not affected by past events. In semi-strong efficiency, stock prices adjust to reflect all publicly available information. Technical or fundamental analysis would therefore be obsolete in achieving above average stock returns. Similarly, markets with strong-form efficiency adjust to incorporate past conditions, publicly available information, and private information.

Because inflation is a market variable of interest to investors, the theory infers that news on anticipated inflation levels is incorporated in stock prices and thus stock market returns are well adjusted in line with new information.

Various criticisms arise by scholars in relation to the theory. Malkiel (2003), noted that investors did not perceive new information in the market the same way. As a result, there were periods of under reaction and over reaction in the market by investors which had an impact on abnormal returns sometimes observed in the market. This also explained why some investors had consistently beaten the stock market and obtained superior returns through fundamental and technical analysis.

An empirical study by Lo and Mackinlay (1999) noted that a test on the serial correlation of stock market prices in the short run was expected to yield zero serial correlation if the efficient market hypothesis were true. Empirical findings rebutted this assumption.

According to this theory, the market incorporates new information rapidly and equity prices reflect all pertinent information. This study will determine whether the NSE is an efficient market and whether stock prices reflect inflation news.

## **2.2 Determinants of Stock Market Returns**

This section discusses how GDP, interest rates, currency exchange rates, and money supply affect stock market returns.

### **2.2.1 GDP**

Gross domestic product (GDP) is a term that refers to an economy's total income and output for a fiscal year. This category encompasses both domestic and foreign investment within the authority of the respective country. Numerous studies have attempted to explain how GDP and stock markets are related. Boubakari and Jin (2010) noted that there are different variables entangled with GDP that explain stock market returns. As such the outcome is not obvious but varies from country to country Levine and Zervos (1996) also noted that rapid economic growth does not always translate into higher long-term stock market returns. In their study, they noted that well developed financial markets could channel appropriately the increased income in the economy to harness growth of firms and therefore stock market returns. Where the financial markets were not efficient, increased GDP growth rate did not result in increased stock returns.

Tachiwou (2010) in his study of the West African market noted that stock prices were merely signals of consumers predictions of future economic growth. Stock returns therefore grew where the expectation was an increase in GDP. The inverse would also be true where investors predicted a contracting economy.

Babu (2015) in his study, noted that an increase in GDP increases disposable income for investors who in turn pool their money in the stock market for increased returns. Additionally, the surge in the demands for shares causes the stock prices to go up thus explaining the positive correlation between GDP and stock market returns.

### **2.2.2 Inflation**

Inflation is expounded by the continuous increment in the prices of tangible and intangible products. Mogare (2014) associated stock return fluctuation with the deviations in the prices of goods and services. The inflation is affect the consumers of country and can promote the decline in purchasing power. According to Aliyu (2018) control inflation is paramount for the banking sector to thrive and blossom. The central banks have critical role in controlling the inflation to promote holistic economic stability and reduction of predicament in the economy. The increment in prices can trigger reduction in demand due to scarcity of money. The central banks is therefore paramount in the momentary increase or decrease on the monetary resources. Since the inflation is the critical variables in the market affecting massive areas, it has influence on the stock market return.

### **2.2.3 Interest Rate**

Interest rates play a crucial part in regulating money supply. Through monetary policy, central banks may adjust interest rates to stimulate economic growth. Even though changes in interest rate take time to be felt across the economy, an almost immediate effect is felt within the stock market. Where the government through the central bank increases interest rates, banks and financial institutions are forced to pass this cost through to borrowers to maintain their margins. Additionally, firms who rely on these funds have higher finance costs and households have less disposable income. Higher operational costs for firms and households translates to more expensive products and higher expenditure overall which reduces profits and therefore affects stock market

returns. The inverse is true for a reduction in interest rates (Eldomiaty et al, 2020).

#### **2.2.4 Exchange Rate**

The interrelation amid stock market returns and exchange rates is not inherently apparent. This is because of the inconsistency in research findings among various scholars on the topic. This observation therefore points to other underlying variables affecting both variables with a causal effect from one end to the other.

According to Hennigar (1988), inconclusive findings were drawn when assessing impact of exchange rates in seven sectors across the United States. No significant relationship were observed for some of the industries, while a negative relationship was observed in others. The conclusive outcomes generalized that exchange rates exhibited minimal influence on stock returns of particular firms and sectors.

The inconsistency can be rationalized as follows; Exchange rates determine both input and output prices of commodities. Where a country relies on its exports as a significant portion of its GDP, currency depreciation affects overall economic performance thereby causing lower returns at the stock market. It can also be noted that where foreign currency investment is marginal within an economy, such fluctuations tend to have minimal influence on stock market returns and economic performance.

#### **2.2.5 Money Supply**

According to Sirucek (2013) money supply affects stock returns directly. An increment in money supply causes firms to have access to more funds at favorable interest rates. These funds can be used to spur growth and development within the economy. Similarly, a decrease in money supply limits cash flows channeled to firms by financial intermediaries. This reduces profits and slows down economic growth thereby leading to reduced stock market returns.

The increase in money supply should however go hand in hand with output and production within

the economy. Where money supply outweighs production, inflation sets in negating the growth experienced by firms and stock market returns.

## **2.3 Empirical review**

This section presents articles, journals and research conducted on the impact of inflation on stock market returns both locally and globally.

### **2.3.1 Global Review**

Yadav et al. (2015) assessed the impact of CPI on the Karachi Stock Exchange's equity returns. This study spanned a decade and sought to blueprint both the short run- and longevity effects of inflation. CPI was used to determine inflation, while the Karachi stock 300 index was used to determine market returns. The study noted a positive but negligible association between inflation and stock returns.

Kuwornu (2012) used month on month data from 1992 to 2008 to review the impact of macroeconomic components on Ghanaian equity returns. The empirical findings indicate that there was cointegration between the variables of interest. There was a long-run equilibrium correlation. Additionally, the findings indicated that, in the short-period, TBill rates and inflation rates portray a substantial relation to stock returns.

Chen and Jin (2004) used a set of economic variables to conduct a multivariate analysis on twenty NYSE portfolios. The variables included, interest rates, unexpected inflation changes, deviation in estimated inflation and the monthly growth rate of firms' productivity and their lags. Additionally, the lag of excess rate of return was used as the dependent variable. The authors concluded that the lagged variables all contribute to the conditional excess rates of returns.

Luintel and Paudyal (2006) discovered a positive association amid equity returns verse inflation. The research noted that stock returns were elastic to inflationary pressures. The elasticity was higher than unity. In a nutshell, the findings were highly plausible theoretically, since it mandates

the investors to continually invest in the stock market nominal returns that must continually exceed the inflation rate and tax deductions.

Adrangi et al (2000) examined the economy in Brazil and noted an inverse association linking the stock returns and inflation. The finding supported Fama's hypothesis. They concluded that inflationary pressures impacted future corporate returns. Nominal discount rates rose to mitigate this. Long run effects supported the intriguing proxy effect concept.

Kaul (1986) discovered evidence that inflation and stock returns were impacted the monetary sector's equilibrium process. Consequently changes in supply and demand of money affected the variables significantly.

### **2.3.2 Local Review**

A 2016 study by Mugambi and Okech motivation to analyze the effects of macroeconomics variables on banks listed at the NSE. They noted that interest rates, forex rates and CPI contributed meaningfully to the bank returns. Conversely, GDP registered a non-substantial effect on the banks stockreturns. Furthermore, the study proposed implementation of government policies that would promote stability within the economy.

Kemboi and Tarus (2012) studied the Kenyan equity market from 2000 through to 2009. They used quarterly secondary data to examine the variables and adopted the Johansen-Julius cointegration technique to assess whether cointegration existed between the variables. They noted that prosperity of the banking sector, income levels, liquidity of the stock market were significant contributors to the Nairobi Securities Exchange's development. Additionally, the findings indicated that a stable macroeconomic environment was not a reliable indicator of the securities market's development.

At the Nairobi Securities Exchange, Barasa (2014) noted an interesting observation in his study of the determinants of stock market performance. It was irrefutable that inflation, NSE 20-share

index, money supply and GDP impacted the stock market. However, all the variables of interest deteriorated pre, during and post the electioneering period. Additionally, the study established that CPI-based inflation and stock market performance were inversely related. It wrapped-up that inflation and stock performance had an inverse and non-significant relationship.

Aroni (2012) used money supply and interest rates are pivotal in the stock prices. In addition, exchange rates and inflation to analyze the factors influencing stock prices for NSE listed firms between 2008 and 2010. A multiple regression formula was used. The regression results denoted that all factors except money supply were significant. The results indicated a negative correlation linking exchange and interest rates verse stock prices, but a positive correlation exploration of inflation and money supply.

Kimani et al (2013) assessed effect of inflation, the CDS, deposit rate, GDP and forex rates on the Nairobi stock market's performance from 1998 through to 2010. Unit root test analysis and the Johansen-Juselius VAR, revealed more than four cointegrating relationships. The study revealed that a quarterly clearing of 27% of the deviation from equilibrium occurs. Indeed, the cointegrating model revealed that inflation and stock market performance in Kenya are negatively correlated. Additionally, it was demonstrated that the CDS has a significant positive effect on the equity market performance.

## **2.4 Summary of Literature Review and Research Gaps**

Even though the nature of the correlation that combines inflation and stock market return is one of intense interest by researchers worldwide, there is no consensus on the strength and direction of the relationship. Various theoretical foundations also offer diverse opinions on the topic. The Proxy and Fama Hypothesis assert that a negative linkage exists between stock market returns and inflation. Where inflation rises, stock market returns are expected to drop. On the other hand,

Fisher's Hypothesis argues that stock returns are an underlying claim on real assets owned by firms. Because inflation causes investors to increase investment in real assets, accordingly, stock market returns should appreciate in value during periods of increased inflation. The theory maintains that stocks are a hedge against inflation.

Studies conducted in US and European countries noted an inverse association between Inflation and stock returns. The studies however did not give insight as to why this phenomenon was observed or other underlying variables that could have contributed to the findings. Existing research concedes that policy changes could have contributed to the association observed between the variables. Accordingly, splitting the research period based on changes in policy would yield a much better analysis on existing theories.

Locally, existing research findings have been inconclusive. Studies on the correlation between inflation and the banking sector returns have revealed a significant inverse relationship. Divergent findings were however noted in a similar study on inflation and stock returns. In this study, it was noted that an increase in inflation yielded similar increases in equity returns. Researchers have also tested the underlying associations between other macroeconomic variables such as forex rates and stock market returns. A one-way causality was identified from exchange rates to stock prices. Other studies also noted that T-Bill rates and GDP moved contrary to interest rates. Conversely, CPI and the market share index were positively related.

In reference to the examination the existing theories and research studies, the following research gaps emerge: A large number of the studies were conducted in developed economies like US, UK and Japan with fewer studies in emerging markets. The findings while insightful, are not representative for developing countries like Kenya. Secondly, local research has been predominantly focused on other macroeconomic variables such as exchange rates. The review

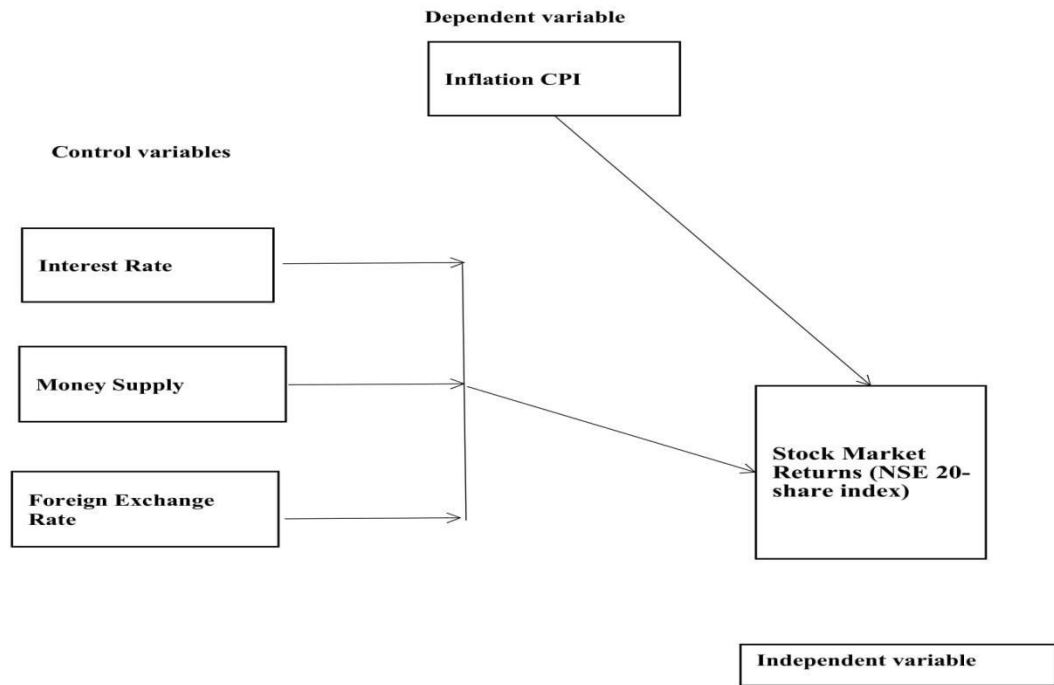


conducted at the NSE was also noted to be sectoral and only incorporating specific market segments such as banking sector and not the equity market as a whole. Lastly existing studies adopted simple regression models and did not differentiate between short-run versus long-run effects of inflation on stock market returns.

## **2.5 Conceptual Framework**

This diagram depicts the concepts underlying this study, as well as the relationships between the variables. Inflation, denoted by the Consumer Price Index, is the independent variable (CPI). The predicted variable is the stock market return, which is represented and expounded in the NSE 20 share index. Finally, the study's control variables are the money supply, exchange rates, GDP, and interest rates.

Governments can adjust economic indicators such as GDP, inflation, money supply, interest rates, and exchange rates through fiscal and monetary policy, thereby directly affecting the level of inflation within an economy. Inflation rate changes can have a direct or indirect effect on the economy, affecting stock market returns. The conceptual framework is depicted in Figure 2.1.



**Figure 2.1 Conceptual Model (Source: Researcher 2022)**

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section discussed the study's research design. It examined the empirical model, the variables evaluated, the population, the sample design and the appropriate data collection technique. The chapter summarize by coining the critical analysis methods that are cornerstone for the far-reaching understanding.

#### **3.2 Research Design**

As per Troachim (2008) the intensive examination is aided by research. It gives deep focus to the layout and the structure pivotal for conclusive investigation. It displays the functions of the key areas covered and their contribution to answering the pertinent questions central to the research. Further, the design acts as a road map by guiding the researcher on the data to be collected, analysis to be done, and how the observations ought to be interpreted (Yin, 2003).

Descriptive research design played a substantial part in this study. Mogire (2014), this approach focuses on describing the variables, their observed characteristics, and systematically analyzing the causal relationships between them to comprehend the association combining inflation and stock market returns at the NSE. After analyzing the statistical correlation amid the variables, this research design enables the researcher to explore the strength and direction of the relationship.

#### **3.3 Population**

The population consists of the 66 firms that were listed in the NSE in December 2020. The firms

are the epicenter in the generation of data for analysis and interpretation. Cooper and Schindler (2003) exemplified a sample as an assemblage of elements whereby the percentage derived is directly correlated to the population. The sample is taken from the target population. The sample consists of nineteen firms whose shares comprise of the NSE 20 index. The NSE 20-share was considered a proxy for overall stock prices in the period under investigation. Dubravka et al (2010) assert that the market share index has the greatest statistical significance when it comes to explaining stock returns. The NSE 20-share index consists of nineteen of the best-performing stocks across the economy's ten sectors. The selected stocks are widely traded with market caps above 1 billion (NSE, 2019). The NSE All share index was not selected as it included fewer active stocks and inactive shares. Any minor changes to the index due to macroeconomic pressures would be difficult to evaluate due to the dilution of the index with shares that were less elastic to macroeconomic variables.

### **3.4 Data Collection**

Thus, the period chosen was sufficient to observe both the short-run as well as longevity patterns of the variables under consideration. The study relied on secondary sources of data. Monthly data on the NSE 20-share index were collected. Inflation was calculated using the CPI as sourced by KNBS economic surveys. The Central Bank of Kenya provided monthly data relating to the interest rates, money supply, and currency exchange rates.

### **3.5 Data Analysis**

SPSS was maximized in the computation and quantification collected. Regression analysis was maximized in determination of the association amid explanatory and explained variables. Tables were used to assess and present the research findings.

#### **3.5.1 Analytical Model**

The regression model utilized to analyze the effect of inflation on stock market returns is as

specified below:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + e$$

Where,

Y = Equity market returns operationalized as monthly NSE 20 share index

B<sub>1</sub> = Level of Inflation operationalized as monthly CPI rates

B<sub>2</sub> = Interest rates operationalized as monthly weighted average commercial bank lending rate

B<sub>3</sub> = Money supply operationalized as by monthly broad money supply (M3)

B<sub>4</sub> = FX rates operationalized as monthly average KES to US dollar rates

B<sub>0</sub> = Constant

X<sub>1</sub> – X<sub>4</sub> = Regression Coefficients

e = Error term

### **3.5.2 Diagnostic Tests**

The study included a test of operationalization of the variables through various diagnostic tests for multicollinearity, heteroskedasticity and serial correlation.

#### **3.5.2.1 Multicollinearity**

Gujarati (2009) notes that when running regression models, magnitude of correlation is more important than the absence or presence thereof. Where larger error term values are present, the accuracy of the null or alternate hypothesis cannot be tested appropriately. A correlation coefficient greater than 0.8 indicates severe multicollinearity (Cooper and Schindler, 2003).

#### **3.5.2.2 Autocorrelation**

This refers to the existence of correlation between a variable and the lagged version of itself. This

study will obtain panel data from 2010 to 2020. It will therefore be critical to assess the existence of serial correlation between the variables of interest. Wooldridge (2010) notes that failing to detect autocorrelation results in biased error terms and incorrect parameter values.

### **3.5.2.3 Heteroskedasticity**

The classical linear regression model assumes homoscedasticity in the error term. Where the error terms are not constant, unbiased parameters may still be obtained. However, the error term estimate will be inaccurate and the variation of the errors is not constant, the data are heteroskedastic. According to Poi and Wiggins (2011) the Likelihood Ratio (LR) test is ideal in identifying these errors in panel data.

## CHAPTER FOUR

### DATA ANALYSIS, FINDINGS AND DISCUSSION

#### 4.1 Introduction

The pivotal areas for descriptive analysis, inferential statistics and discussion is this chapter. It gives chief latitude to the association between the predictor and predicted variables. The study analyze the stock market returns in conjunction with inflation. The findings are critical for reinforcing the understanding of the study. Therefore, diagnostics and regression analysis are presented in this investigation to address the problems and the objective emanating from the research.

#### 4.2 Descriptive Statistics

This analysis entails the postulation of maximum and the minimum. Additionally, it also give chief focus to the mean and standard deviation of variables under study. It also shows the graphical analysis of the findings.

**Table 4.1 Summary Descriptive Statistics**

	Descriptive Statistics			
	Minimum	Maximum	Mean	Std. Deviation
Stock Market Return	12.1500	18.2200	13.761316	1.2653267
Inflation CPI	51.9300	188.9300	112.761842	44.5043970
Interest Rates	67.8500	117.1700	88.894474	12.3283271
Money Supply	17.3700	28.9600	21.543026	2.9669207
Exchange rates	17.8300	29.8700	19.506316	2.3912016
Valid N (listwise)				

The above findings presents a summary of the variables under study. The average stock market return for the period under study was 13.76 with a minimum 12.15. In addition the maximum value computed was 18.22. The average inflation of consumer price index was 112.76. The

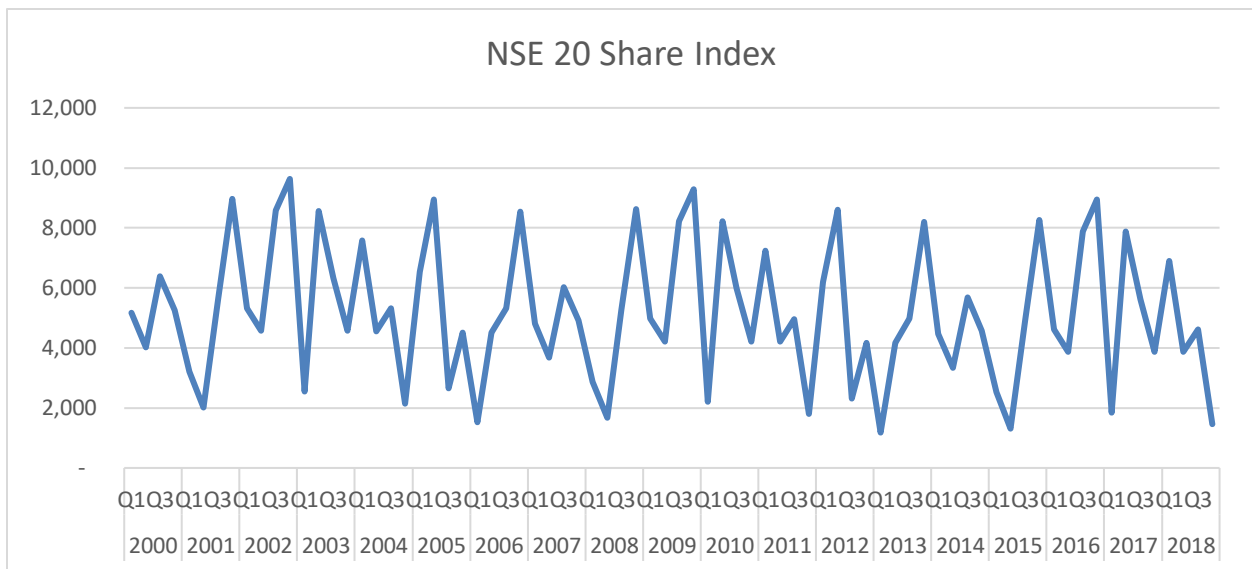
interest rates were averaged at 88.89. The average money supply and exchange rates were 21.54 and 19.51 respectively. The standard deviation were 1.26, 44.50, 12.33, 2.97 and 2.39 for stock market return, consumer price index, interest rate, money supply and exchange rate respectively. Therefore, consumer price index posted high volatility followed by interest rate.

### 4.3 Graphical Analysis

This section is epicenter for elaboration of nature and pattern of predictor variables verse the stock market returns.

#### 4.3.1 NSE 20 Share Index

The figure presented below defines the trend of quarterly NSE 20 share index thereby giving detailed information in snapshot. The figure stipulates a sudden changes, fluctuations and deviations of NSE 20 Share Index hence expounding on its nature over the study period 2000-2018



**Figure 4.1 NSE 20 Share Index**



### 4.3.2 Inflation on Consumer Price Index (CPI)

The graph below shows a steady increase in inflation over the years

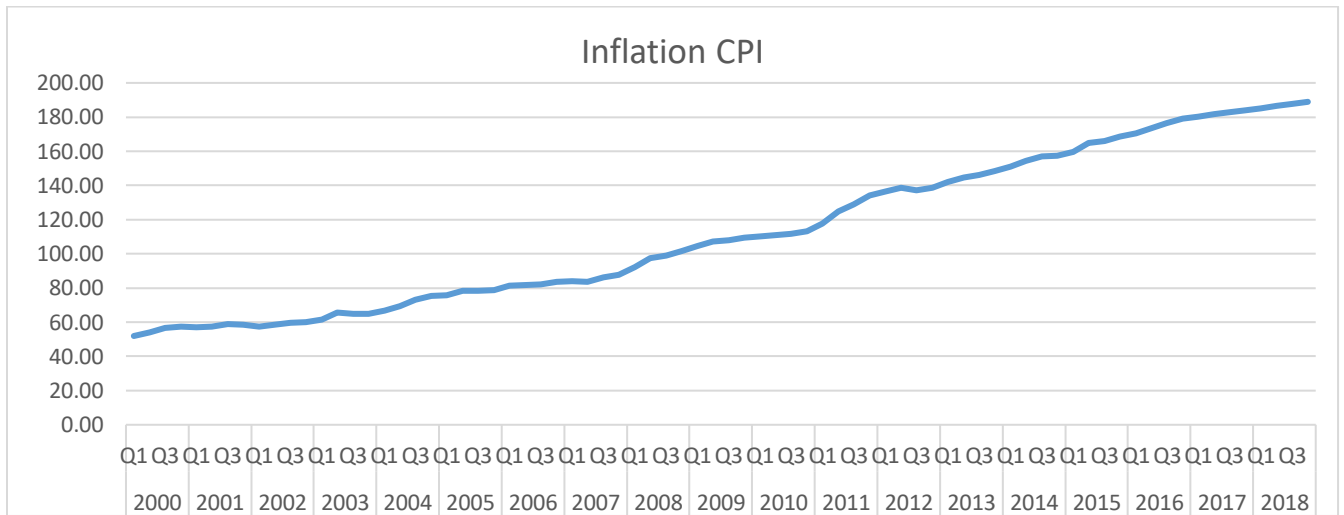
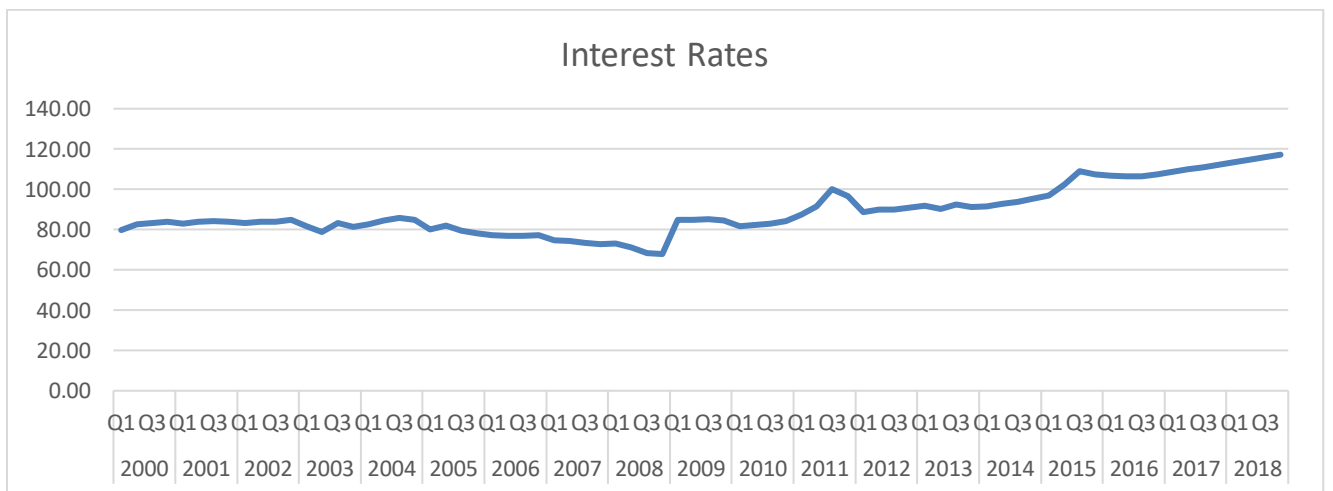


Figure 4.2 Consumer Price Index

### 4.3.3 Interest Rates

The figure of interest rate presented below post its pattern and trends over the study period. At one point from 2009 to 2018 it increases without fluctuating unlike from the period 2000 to 2008.



### Figure 4.3 interest Rates

#### 4.3.4 Money Supply

In 2000 money supply starts on a high note then decreases gradually to the year 2004 it flattened. In 2005, It started rising gradually but at some points it drops and then rise again. It 2010 it rose rapidly and stagnated in 2012 before dropping gradually. In 2015 it exhibited a sharp reduction. However, in 2017 and 2018 Money supply increases rapidly.

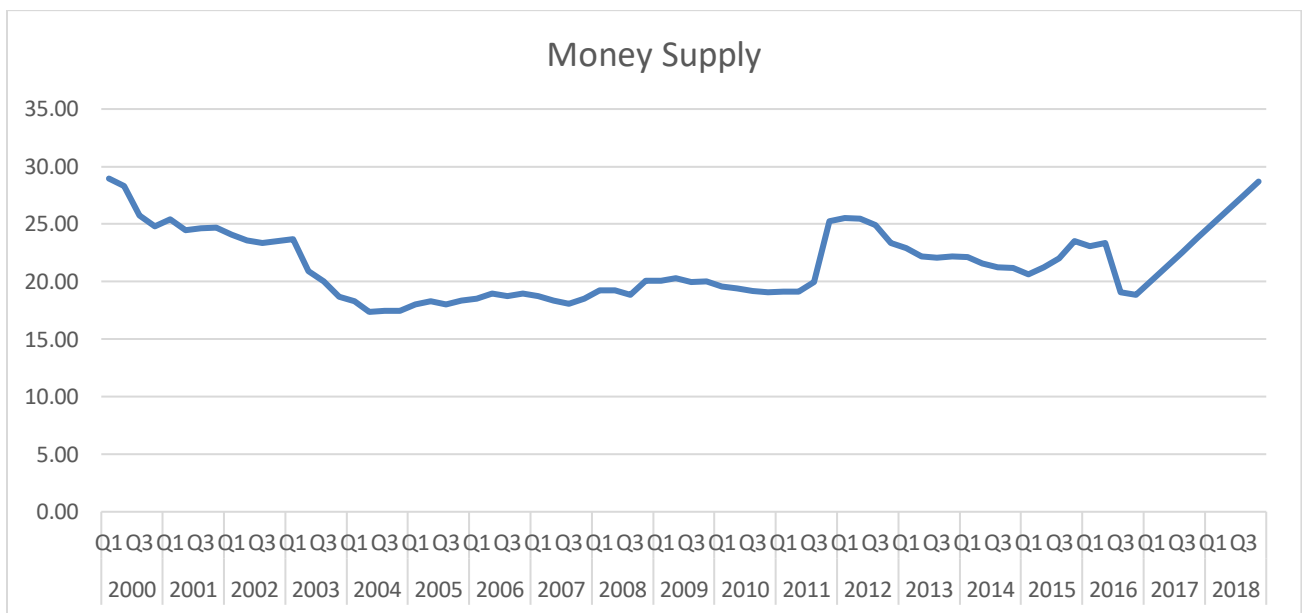
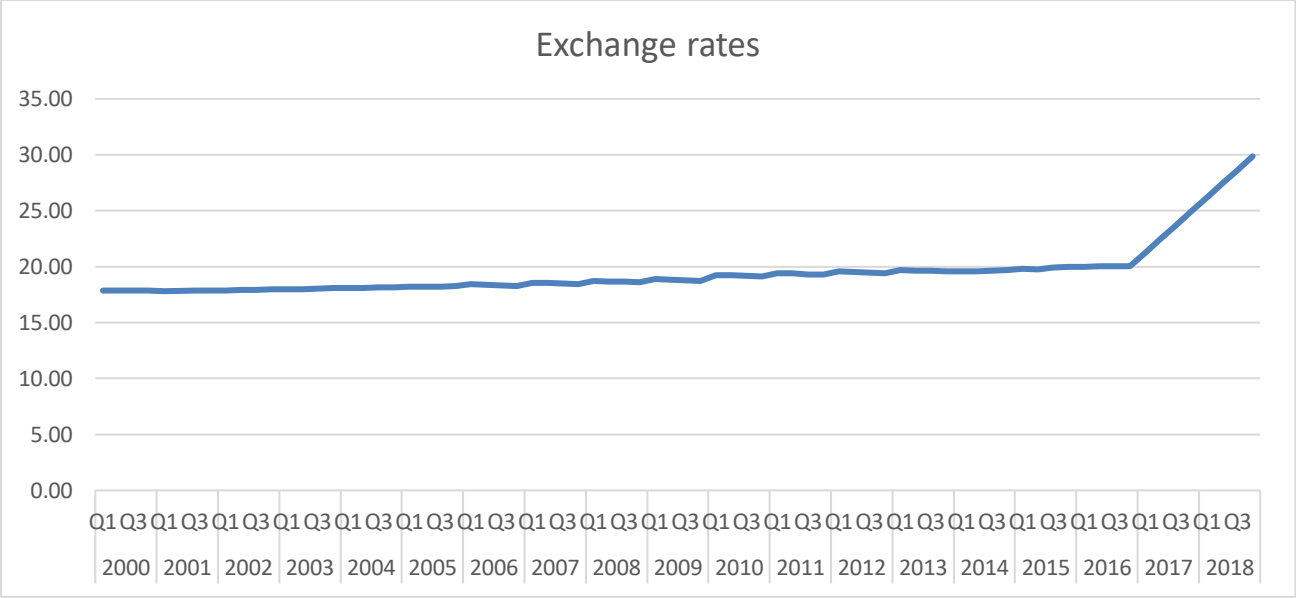


Figure 4.4 Money Supply

#### 4.3.5 Exchange Rates

Exchange rates has been gradually rising. The highest rise can be witness from the 1<sup>st</sup> Quarter of 2017 to 4<sup>th</sup> Quarter of 2018.



**Figure 4.5 Exchange Rates**

**4.4 Correlation Analysis**

Correlation analysis was critical in illustrating the linkage between the explained and explanatory variable. The study examined the magnitude and direction blueprinted by the variables. The findings tabulated below is paramount in coining the pattern and the nature of data collected. Moreover, the analysis provides an in-depth answers to research problem and research gaps. Therefore, the analysis posted defines the relationship linking the regressor and the regressed variables. From the findings tabulated; it is evident that Inflation CPI, interest rates and exchange rates had a strong positive correlation towards the SMR as seen by (r=0.760, p=0.001), (r=0.729, p= 0.001) and (r=0.941, p=0.001) respectively. Money supply on the other hand, had a weak positive correlation towards stock market return as shown by (r=0.200, p=0.083).

**Table 4.2 Correlation**

		<b>Correlations</b>				
		stock market return	Inflation CPI	Interest Rates	Money Supply	Exchange rates
stock market return	Pearson Correlation	1	.760**	.729**	.200	.941**
	Sig. (2-tailed)		.000	.000	.083	.000
	N	76	76	76	76	76
Inflation CPI	Pearson Correlation	.760**	1	.839**	.177	.737**
	Sig. (2-tailed)	.000		.000	.127	.000
	N	76	76	76	76	76
Interest Rates	Pearson Correlation	.729**	.839**	1	.418**	.772**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	76	76	76	76	76
Money Supply	Pearson Correlation	.200	.177	.418**	1	.401**
	Sig. (2-tailed)	.083	.127	.000		.000
	N	76	76	76	76	76
Exchange rates	Pearson Correlation	.941**	.737**	.772**	.401**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	76	76	76	76	76

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

#### 4.5 Diagnostic Test

The research maximized diagnostic analysis to postulate the nature of data. It was spearheaded to guide the further scrutiny and analysis. The study was needed to expound on the far-reaching findings. The study diagnostic test undertaken incorporated multicollinearity, autocorrelation and normality test. Therefore, multicollinearity test was tested using the VIF (variance of inflation), test for normality was also conducted using the Kolmogorov-Sminonor. Moreover, autocorrelation accomplished using the Durbin Watson.

#### 4.5.1 Multicollinearity Test

This test was done by the researchers to accentuate the association among the explanatory variables. The findings showed that all variables had its VIF values smaller than 10 and all its Tolerance vales greater than 0.2. Thus implying that there was absence of multicollinearity existing between the Independent variables. Jonhson and Manley (2018) opines that  $VIF \geq 2.5$  is considerable in the analysis. Moreover James, Witten and Tibshiraim (2017) blueprinted that VIF higher than 5 post risk to analysis. Furthermore,  $VIF > 10$  is problematic and dangerous for analysis hence highly correlated variable is eliminated. In this study the values are within the normal range.

**Table 4.3 Collinearity Analysis**

Model	Collinearity Statistics		
	Tolerance	VIF	
	(Constant)		
1	Inflation CPI	.232	4.318
	Interest Rates	.205	4.881
	Money Supply	.678	1.474
	Exchange rates	.354	2.829

#### 4.5.2 Normality Test

The normality test is crucial for reinforcing the descriptive analysis by elaborating the linearity association, regression coefficient analysis, inferential statistics and estimations that are useful for forecasting. Normality test is useful in that it shows the distribution of data that was collected. The researchers conducted the Kolmogorov-Smirnov in addition to the Shapiro Walk test to ascertain the normality.

**Table 4.4 Tests of Normality**

	Kolmogorov-Smirnova <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
stock market return	.317	76	.000	.753	76	.000
Inflation CPI	.135	76	.002	.913	76	.000
Interest Rates	.189	76	.000	.920	76	.000
Money Supply	.148	76	.000	.932	76	.001
Exchange rates	.308	76	.000	.622	76	.000

a. Lilliefors Significance Correction

From the table above, the significance values in both the Kolmogorov-Smirnov in furtherance to Shapiro-Wilk test are less than the p value 0.05. This showed a normality in the distribution of data thus the null hypothesis was rejected in the sound judgment procedure. The data the epicenter for the Pearson correlation matrix.

#### 4.5.3 Autocorrelation

This analysis was done to establish the error term across the time period. The findings were as stipulated as per the tabulation below:

**Table 4.5 Autocorrelation Test**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.963 <sup>a</sup>	.927	.923	.3507825	.261

Durbin-Watson value obtained was 0.261 which is less than 2 thus lying in the normal interval

hence insinuating that normality in the distribution of error term.

## 4.6 Regression Analysis

This is the method of coming up with a formula that can be pivotal the futuristic prediction. The researchers also utilized the SPSS statistical package to generate the outcome at 95% confidence interval. The multiple regression computation was crucial in the explanation of variables. This is was the lifeblood for the illustration of association among all variables for prediction and forecasting.

### 4.6.1 Model Summary

Stock return was regressed in conjunction to all the explanatory variables; exchange rate, money supply, inflation CPI and interest rate. The findings have been tabulated below.

**Table 4.6 Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.963 <sup>a</sup>	.927	.923	.3507825	.261

Predictors: (Constant), Exchange rates, Money Supply, Inflation CPI, Interest Rates

Dependent Variable: stock market returns

From the intensive computation as stipulated below R is 0.963 while R Square is 92.7. This analysis posit that all the factors prioritized in this study amounted to 92.7% in deviating stock return. In summary, exchange rate, money supply, inflation CPI and interested rate represent 92.7% of all the contributors of deviation and variation in stock return. Therefore, the remaining 7.3% are other variables exempted in the computation.

#### 4.6.2 Analysis of Variance (ANOVA)

From the computation of variation as well as deviation in the table below, the P-Value, is less than 0.05, thus posting that the explanatory variable such as; exchange rates, money supply, inflation CPI and interest rates expounds the variation in the predicted variable that is SMR.

**Table 4.7 ANOVA<sup>a</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	111.342	4	27.836	226.217	.001 <sup>b</sup>
	Residual	8.736	71	.123		
	Total	120.079	75			

a. Dependent Variable: stock market return

b. Predictors: (Constant), Exchange rates, Money Supply, Inflation CPI, Interest Rates

Furthermore, the sum square computed in the regression was 111.342 on the other side the mean square was 27.836 with 4 degrees of freedom. In addition sum of square computed after residual analysis was 8.736 at the same time, the mean square was 0.123 with 71 degrees of freedom. In addition, the significance value resulting from the analysis is 0.001 which is smaller than the p value 0.05, thus indicating that the model is statistically significant.

#### 4.6.3 Coefficient of Determination

**Table 4.8 Coefficient of Determination**

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	5.491	.464		11.836	.000
	Inflation CPI	.003	.002	.101	1.525	.132
	Interest Rates	-.001	.007	-.011	-.158	.875
	Money Supply	-.083	.017	-.195	-5.023	.000
	Exchange rates	.504	.028	.953	17.707	.000

a. Dependent Variable: Stock market Return

From the computation outcome above; inflation CPI and Exchange rates had positive influence on stock market while Interest rates and the money supply had negative influence on stock



market return. Additionally, an addition of one unit of Inflation CPI translates to an increase in stock market return by 0.003. Moreover, an increment of one unit of interest rate triggers a reduction in stock market return of 0.001. Moreover, a single unit increase in the money supply translated to a decrease in stock market return by 0.083. Finally, an increment of single of exchange rate causes 0.504 changes in the stock market returns.

From the comprehensive discussion postulated above, the regression model can be generated as;

$$Y = 5.491 + 0.003 X_1 - 0.001 X_2 - 0.083 X_3 + 0.504 X_4$$

Where

Y = Stock market return

X<sub>1</sub> = Inflation CPI

X<sub>2</sub> = Interest Rates

X<sub>3</sub> = Money Supply

X<sub>4</sub> = Exchange rates

#### **4.7 Discussion of the Research Findings**

The study strived to examine the effect of inflation on the SMRs of firms listed at the NSE. The predictor variables were exchange rates, money supply, inflation CPI and interest rates. The Pearson correlation statistical computation postulated a strong positive correlation between explanatory variables (Inflation CPI, Interest rates as well as exchange rates) towards the predicted variable (stock market return). Nonetheless, the money supply exhibited a weak though negative correlation towards SMRs.

The output is inconsistent with Barasa (2014) elucidation that CPI is inversely linked to the SMR. The same study explained the substantial role of GDP in the determination of SMR. Further, study by Luintel and Paudyal (2006) concurs with the prevailing study by highlighting

positive nexus amid inflation and T-Bills verse SMR. Therefore, stock market prediction and computation of returns are critical for mobilization of resources, providing investment opportunities and increasing international investment and foreign exchange rate (Barasa, 2014). According to Aron (2012) interest rate, money supply and exchange rate move in different direction with the stock market returns.

In addition, the outcome coined absence of multicollinearity among the predictor variables thereby signaling that the data was suitable in elaborating on changes in the regressed variable. Additionally, the study findings showed that the predictor variables Inflation CPI, interest rates and exchange rates explain 92.3% of deviation in stock return of listed firms at the NSE as indicated by the Adjusted R Squared value. The findings mean that 7.7% of changes in the stock return is coined by different variables not captured in the study model. In addition, the result show there is a strong relation among selected predictors and SMRs at a correlation coefficient of  $R=96.3\%$ . In concurrence, Kemboi and Tarus (2012) demonstration that macroeconomic variables are the root cause of deviation in the stock prices. In addition Mugambi and Okech (2016) illustrated the cornerstone foundation of interest rate, inflation as well as forex in the stock market variation.

The conclusion relating to descriptive statistics exemplify the nature of each variable based on the results. The descriptive analysis of the study opined that the stock market return averaged at 13.76 while the minimum and maximum was stipulated by 12.15 and 18.22 respectively. The inflation and interest rates recorded a mean of 112.76 and 88.89 consecutively. On the other side, money supply and the exchange rates registered an average of 21.54 and 19.51 respectively. The SD for stock market return was 1.26, consumer price index 44.50, interest rate 12.33, money supply 2.97 and exchange rate were 2.39. Therefore, the consumer price index was highly

volatile followed by interest rate.

The regression model blueprinted a statistically significance at the 95% confidence interval affirming that it was appropriate to explain how the regressor variables affected the stock market return of companies listed at NSE. In a nutshell, the findings offered far-reaching conclusion on the association between inflation and the stock market return.

The study results posit that an increment of one unit of inflation CPI triggers increment in stock market return by 0.3% if the remaining variables are kept unchanged. A unit addition of the interest rates leads to 0.1% reduction in stock market returns whenever all enablers are maintained constant. In addition, an addition in money supply translates to 8.3% decrement in stock market returns if all factor are held constant. Additionally, an advancement of one unit of exchange rate triggers to 50.4% increase in stock market return when all factors are kept constant. Moreover, the autonomous figures stands at 5.491.

From the intensive analysis opined above, the multiple regression model is;

$$Y = 5.491 + 0.003 X_1 - 0.001 X_2 - 0.083 X_3 + 0.504 X_4$$

Y = Stock market return

X<sub>1</sub> = Inflation CPI

X<sub>2</sub> = Interest Rates

X<sub>3</sub> = Money Supply

X<sub>4</sub> = Exchange rates

The findings expounded on the previous studies such as Yada el al (2015) postulation that inflation and stock returns are substantially and positively correlated. According to Mugambi and Okech (2016) the chief determinants of stock market returns are forex rate, interest rate and CPI. The researcher context of study was banking sector.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

Summary of the investigation is pivotal in the cornerstone for elaboration. The conclusion expounds about the findings substantially. The recommendation explicates the computation and interpretation. This chapter accentuates the conclusive outcomes that resolve the knowledge gaps. It is the pinnacle of problem solving, filling the knowledge gap and clarifying the pending issues. It commentates the comprehensive outcome useful for decision-making process.

#### **5.2 Summary**

The study's objective was to explore keenly the effect of inflation on the stock market returns of companies quoted at NSE. The study was motivated by the fact that stock market prices represents the nation economic fitness and health. The factors epitomized in this study include; Inflation CPI, Interest Rate, Money supply and foreign exchange. Empirically, the study concentrated on the inflation and the stock market returns. Several analysis were undertaken to inform key outcomes. The study blueprinted that inflation CPI and interest were increasingly susceptible to volatility.

The study epitomized descriptive research deign to promote exhaustive findings among firms listed NSE. The study considered a sample of 19 firms comprising of NSE 20 share index. The statistical computation performed intensive diagnostic tests to blueprint the correlation among the variables. The multicollinearity was undertaken by the assistance of Variance Inflation Factor (VIF). The findings pinpointed the absence of correlation among the predictor variables. Additionally, the normality computation was accomplished via Kolmogoro-Smirnova as well as

the Shapiro-Wilk to coin the pattern and distribution of data. The analysis postulated a normality in the data distribution pattern. Furthermore, Autocorrelation was run using Durbin Watson and concluded that the data was within the normal range.

The Pearson correlation coined a strong positive association amid the regressor (Inflation CPI, interest rate and foreign exchange rate). However, money supply pinpointed a weak even though negative correlation with the market returns. The four predictor variables defined the substantial enablers of stock market return based on computation. Additionally, descriptive statistics elucidated that money supply and foreign exchange were weakly volatile. The interest rate and Inflation CPI were highly deviating.

Additionally, the computation of ANOVA illustrated that the explanatory variables (Inflation CPI, interest rate, money supply and foreign exchange rate) were statistically significant. The input data was there crucial to reach a conclusive findings. This study was critical in the explanation of different views, accurate market development and enlightening on the stock market returns.

### **5.3 Conclusion**

The shareholders contends that stock market return is chief indicator of economic prosperity. Additionally, whenever the stock does excellently, it influences the importance sectors of the economic. Similarly, news on inflation CPI, money supply, interest rate, and foreign exchange shapes the reaction of stock market returns as per this research findings. This study wrap-up by coining the importance of the four predictor factors on the stock market return. The correlation analysis coined that inflation CPI insinuated a positive association verse stock market return. Additionally, interest rates and exchange rate exemplify the direction as well as strength. Furthermore, money supply illustrated. Furthermore the four regressor variables were very

substantial in elaborating the stock market returns. Therefore, there were minimal significance of variables not prioritized in the study. The study conclude by elucidating that the four variables factored in the study contributed significant portion of variables influencing the stock market returns.

The conclusion relating to descriptive statistics exemplify the nature of each variable based on the results. The findings illustrated that consumer price was highly volatile followed by interest rate. This encapsulate that both the inflation CPI and interest were highly deviating in the market among the firms prioritized in the study. Therefore, the stock prices were influenced by these volatilities exhibited among the predictor variables.

The highly volatile stock returns have attracted several studies to fast-track their cause. In the financial risk-associated market, it is imperative to make comprehensive and rigorous analysis to reach a conclusive output that useful for prediction. The risk have been associated with market irregularities and forecasting tends to paramount task to curb drastic changes that boost detrimental state of the market. In the event of analysis, it is supreme to delve into stock market returns since it benefits investors, shareholders and policy makers.

The researcher ends by stating that association amid variables based on the computations. Additionally, the inflation and money supply and exchange rate were inversely correlated with stock market return as explained in the coefficient of determination. Furthermore, the stock market verse the interest rate and money supply blueprinted negative correlation thereby leading to exhaustive findings.

#### **5.4 Recommendations**

The study wrapped-up the existing correlation amid the inflation and SMR. Based on the outcome, the study recommends for government policies that control the volatility of inflation so

reduce the fluctuation in the stock market returns. The research recommends the prudential policy formulation to protect against severe impact of interest rate on the stock market return. The initiation of tight fiscal policies reduces inflation. Additionally, wage control and regulating the total demand.

The increase in money supply translated to an inverse effect on the stock market return therefore, CBK should provide holistic perspective and guideline to ensure money supply has minimal negative impact on the stock market. Moreover, CBK should formulate good policies to enhance positive association between the interest rate and stock market return. The fiscal policies that promote employment and spurs economic growth should be prioritized in the commercial market.

The fiscal policies and framework should be built on strong foundation that enhance the economic transformation and business stability. Moreover, it should attract the investment that gears the economic prosperity and spurs innovation. This is the epicenter for improvement of the living standard. It is the pivotal in improvement of investment and saving behavior. The regulatory bodies that enhance compliance and increase the excellence of the organization.

The study recommends for periodic review of the policies and prospective strategy formulation to enhance efficiency. The firms must innovate ways of enhance the stock market returns and reap from the prevailing market. In general the well-functionality and stability of the business from external macroeconomics, is critical in enhancing stock market returns. Therefore, the business should be forward-looking to enhance their service delivery, increase stock market and

reduce interruptions. CBK should undertake drastic steps in formulating fiscal policies to enhance job creation. The policies should reinforce growth, interest rate adjustment while changing reserve requirement to promote stability. Additionally, open market operation can contain inflation, maintain interest rate and regulate money supply.

### **5.5 Limitations of the Study**

The limitation this study have been summarized into three. Firstly, the data was obtained from annual records of secondary data from CBK and individual firms for NSE 20 index. The secondary portrays past information by representing past trend and that may have been subjected to errors, inaccurate and incomplete input. Hence, the data collected is not first-hand information since, it provide past information. Additionally, the historic data may not be useful for the prediction of market trend and sudden changes. In a nutshell, the data capture quantitative input and output with much consideration to input.

Secondly, the other shortcoming addresses the process, time and cost of buying internet bundles to access the CBK website. Moreover, the general purchase of airtime and other relevant materials associated with data collection was so immense as well as comprehensive thereby expensive. The process of computing NSE 20 index, keying them in SPSS and ensuring it met the required threshold among other rigorous process were time consuming and costly. In a nutshell, the assemblage of data needed great time for examination of completeness, edition, and reviews to meet the required standard. The process was intensive yet expensive. The intensive process demanded for great attention, organizing the data, analysis and presentation. Nonetheless, the researcher managed to overcome the shortcoming by investing adequate time and resources to arrive at exhaustive outcome.

The final limitation is the area of focus in this study. The study focus on the inflation verse SMRs,



therefore, it fails to generalize all the macroeconomic variables. The factors considered were inflation CPI, interest rate, money supply and foreign exchange. The other macroeconomics not prioritized but play great role include; GDP, foreign direct investment and production index among other. Nevertheless, the study analyzed the four explanatory variables and there is room for analysis of numerous variables. The data collected may be associated with errors hence may not be good in making sound decisions. There are numerous factors that informed the stock market return. Therefore, intervening and moderating variables can be incorporated for conclusive findings.

### **5.6 Suggestions for Further Studies**

This study emphasize for a prudent scrutiny of effects of earning management on stock market returns, corporate governance, and management by objective. Earning management is one of the critical factors in the companies and should be compared and contrasted with the stock market returns. This pinpoint the internal factors that plays critical role. In addition, the study elaborates on the asymmetric information in the market.

Additionally, strategies formulation, and dividend yield and capital structure verse stock market returns should be prioritize in the comprehensive analysis. This study forms a significant step in giving accurate views on the role of strategies formulated as well as the anticipated dividend yield. Moreover, it highlight the capital structure to strike the optimum level for debt-equity planning.

Finally, the research advocates for analysis of stock market return as the predictor variables verse the financial performance of the firms. The financial performance can be operationalized using revenues, ROA and ROE. The study can be an eye-opener for the accurate determination of the correlation that inform the performance. In a nutshell, it gives chief consideration to shareholder's wealth by relating performance and



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Edit the work for grammatical and typographical mistakes

## APPENDICES

### Appendix I Raw Data Collection Instrument

YE AR	QUART ER	NSE 20 Share Index	stock market return	Inflation CPI	Interest Rates	Money Supply	Exchange rates
2000	Q1	5,162	12.91	51.93	79.63	28.96	17.84
	Q2	4,025	12.80	54.20	82.75	28.31	17.85
	Q3	6,378	12.80	56.83	83.40	25.77	17.84
	Q4	5,263	12.76	57.41	83.93	24.80	17.86
2001	Q1	3,215	12.71	56.86	82.95	25.39	17.83
	Q2	2,015	12.61	57.55	83.82	24.46	17.83
	Q3	5,632	12.44	58.78	84.15	24.64	17.86
	Q4	8,965	12.41	58.62	83.89	24.69	17.89
2002	Q1	5,321	12.28	57.49	83.26	24.06	17.85
	Q2	4,563	12.19	58.50	83.86	23.58	17.91
	Q3	8,574	12.15	59.80	84.01	23.34	17.92
	Q4	9,632	12.42	60.17	84.73	23.54	17.97
2003	Q1	2,546	12.58	61.65	81.78	23.69	17.97
	Q2	8,569	12.77	65.66	78.92	20.93	18.00
	Q3	6,325	12.97	64.73	83.10	20.02	18.02
	Q4	4,565	13.11	65.00	81.22	18.67	18.09
2004	Q1	7,589	13.13	66.79	82.46	18.32	18.09

	Q2	4,562	13.08	69.31	84.47	17.37	18.12
	Q3	5,312	13.09	73.29	85.92	17.47	18.14
	Q4	2,145	13.18	75.52	84.97	17.45	18.18
2005	Q1	6,532	13.25	75.61	80.00	18.04	18.18
	Q2	8,956	13.49	78.42	81.88	18.29	18.20
	Q3	2,653	13.45	78.43	79.30	18.03	18.23
	Q4	4,512	13.49	78.63	78.31	18.36	18.27
2006	Q1	1,526	13.52	81.55	77.30	18.53	18.41
	Q2	4,512	13.56	81.59	77.00	18.99	18.38
	Q3	5,326	13.69	82.00	76.98	18.74	18.33
	Q4	8,547	13.84	83.47	77.36	18.94	18.28
2007	Q1	4,814	13.74	84.10	74.80	18.76	18.57
	Q2	3,677	13.75	83.66	74.36	18.34	18.53
	Q3	6,030	13.75	86.10	73.55	18.07	18.47
	Q4	4,915	13.80	87.88	72.65	18.52	18.43
2008	Q1	2,867	13.69	92.38	73.08	19.26	18.72
	Q2	1,667	13.75	97.34	71.13	19.26	18.69
	Q3	5,284	13.54	98.95	68.23	18.86	18.68
	Q4	8,617	13.37	101.58	67.85	20.07	18.62
2009	Q1	4,973	13.14	104.70	84.78	20.07	18.87

	Q2	4,215	13.30	107.11	84.78	20.29	18.82
	Q3	8,226	13.21	108.10	85.01	19.96	18.78
	Q4	9,284	13.29	109.27	84.45	20.00	18.74
2010	Q1	2,198	13.51	110.21	81.69	19.59	19.25
	Q2	8,221	13.58	110.85	82.18	19.39	19.22
	Q3	5,977	13.64	111.52	82.78	19.18	19.16
	Q4	4,217	13.60	113.27	84.14	19.07	19.10
2011	Q1	7,241	13.47	117.61	87.41	19.12	19.42
	Q2	4,214	13.49	124.76	91.53	19.11	19.38
	Q3	4,964	13.30	129.08	100.05	19.99	19.32
	Q4	1,797	13.27	134.01	96.72	25.24	19.28
2012	Q1	6,184	13.32	136.56	88.74	25.54	19.56
	Q2	8,608	13.42	138.83	89.96	25.50	19.51
	Q3	2,305	13.49	136.98	89.81	24.93	19.46
	Q4	4,164	13.53	138.55	90.91	23.35	19.43
2013	Q1	1,178	13.69	141.92	91.70	22.93	19.67
	Q2	4,164	13.63	144.66	90.18	22.17	19.63
	Q3	4,978	13.67	146.19	92.37	22.06	19.61
	Q4	8,199	13.70	148.45	91.35	22.19	19.57
2014	Q1	4,466	13.71	151.19	91.53	22.11	19.59



	Q2	3,329	13.69	154.47	92.63	21.56	19.61
	Q3	5,682	13.77	156.82	93.69	21.24	19.63
	Q4	4,567	13.74	157.29	95.24	21.19	19.69
2015	Q1	2,519	13.77	159.68	97.01	20.66	19.82
	Q2	1,319	13.70	164.91	102.21	21.26	19.77
	Q3	4,936	13.54	166.13	109.09	22.02	19.95
	Q4	8,269	13.50	168.47	107.28	23.50	19.99
2016	Q1	4,625	14.30	170.65	106.69	23.07	19.99
	Q2	3,867	14.66	173.47	106.35	23.38	20.03
	Q3	7,878	15.01	176.32	106.47	19.06	20.03
	Q4	8,936	15.37	179.09	107.33	18.86	20.03
2017	Q1	1,850	15.73	180.32	108.56	20.09	21.26
	Q2	7,873	16.08	181.55	109.79	21.32	22.49
	Q3	5,629	16.44	182.78	111.02	22.55	23.72
	Q4	3,869	16.79	184.01	112.25	23.78	24.95
2018	Q1	6,893	17.15	185.24	113.48	25.01	26.18
	Q2	3,866	17.51	186.47	114.71	26.24	27.41
	Q3	4,616	17.86	187.70	115.94	27.47	28.64
	Q4	1,449	18.22	188.93	117.17	28.70	29.87

## Appendix II: Data Analysis

		<b>Correlations</b>				
		stock market return	Inflation CPI	Interest Rates	Money Supply	Exchange rates
stock market return	Pearson Correlation	1	.760**	.729**	.200	.941**
	Sig. (2-tailed)		.000	.000	.083	.000
	N	76	76	76	76	76
Inflation CPI	Pearson Correlation	.760**	1	.839**	.177	.737**
	Sig. (2-tailed)	.000		.000	.127	.000
	N	76	76	76	76	76
Interest Rates	Pearson Correlation	.729**	.839**	1	.418**	.772**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	76	76	76	76	76
Money Supply	Pearson Correlation	.200	.177	.418**	1	.401**
	Sig. (2-tailed)	.083	.127	.000		.000
	N	76	76	76	76	76
Exchange rates	Pearson Correlation	.941**	.737**	.772**	.401**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	76	76	76	76	76

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

### Coefficient of Determination

<b>Model</b>	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>		<b>t</b>	<b>Sig.</b>
	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>			
(Constant)	5.491	.464			11.836	.000
Inflation CPI	.003	.002	.101		1.525	.132
Interest Rates	-.001	.007	-.011		-.158	.875
Money Supply	-.083	.017	-.195		-5.023	.000
Exchange rates	.504	8	.953		17.707	.000