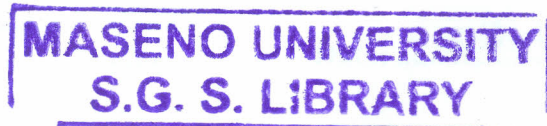


**EFFECT OF INFLATION ON PERFORMANCE OF NAIROBI SECURITIES  
EXCHANGE; KENYA**

**BY:**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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## ABSTRACT

Effect of inflation on the stock exchange has been under scrutiny in past few decades due to the interest potential investors have shown in the stock market globally. However, the empirical studies in this area have concentrated more on developed countries with very little evidence from developing economies with emerging stock markets such as Kenya. The purpose of this study therefore was to determine the effect of inflation on the market activity and market liquidity performance of Nairobi Securities Exchange (NSE). The specific objectives were: to determine the effects of inflation on the value of shares traded at the NSE, to determine the effects of inflation on volume of shares traded at the NSE and lastly, to determine the effects of inflation on the total value of shares traded to market capitalization. The study is anchored on the Fishers theory on inflation and stock market return and guided by a conceptual framework where the dependent variables are the volume of share traded, the value of share traded and the value of share traded to market capitalization at NSE while the independent variable is the inflation rate. The study adopted a correlation research design to establish effect. Secondary data was used which comprised of all ordinary shares traded between 2008 and 2013 on a monthly basis and 72 observations ( $n = 72$ ) were recorded. Data was obtained through review of both Kenya National Bureau of Statistics (KNBS) and NSE documents. A correlation analysis between inflation rate and the value of shares traded showed an inverse relationship of  $-759.48$  and  $t = 1.55 \approx 2.0$  meaning that inflation rate is significant and a unit increase leads to a  $-759.48$  decrease in the value of shares traded. The coefficient of determination of inflation rate is  $R^2 = 0.376$  meaning that inflation rate accounts for 37.6% of the performance of NSE in terms of market value. Further, the analysis of inflation rate on volume of shares traded indicated a correlation coefficient of  $-6.06$  and  $t = -2.21$  meaning that inflation rate is significant and a unit increase leads to a  $-6.06$  decrease in the volume of shares traded. The coefficient of determination of inflation rate against volume of shares traded is  $R^2 = 0.549$  meaning that inflation rate accounts for 54.9% of the volume of shares traded at NSE. In conclusion, the overall performance of NSE measured by value and volume of shares traded is inversely affected by changes in the rates of inflation. These findings are useful for policy formulation to sustain performance of NSE against inflationary effects.



## CHAPTER ONE: INTRODUCTION

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### 1.1 Background

Inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services. To meet the required price rise, individuals have to dig out more from their pockets than is presumed. Increase in inflation directly or indirectly affects most sectors of the economy. The effects of inflation ranges from unemployment, unfavorable interest rates, unstable exchange rates, reduced investments and stock markets volatilities. Inflation and stock market have some elements of association ([www.investopedia.com](http://www.investopedia.com)).

According to Lintner (1975), inflation reflects a situation where the demand for goods and services exceeds their supply in the economy. Its causes could be triggered by the private sector and the government spending more than their revenues, or by shortfalls in output. Price increases could also be triggered by increases in costs of production. For instance increases in prices of imported raw materials will cause imported inflation if not managed. Whatever the initial cause, inflation will not persist unless accompanied by sustained increase in money supply. In this sense, inflation is a monetary phenomenon (Hall, 1982).

Inflation causes many distortions in the economy. It hurts people who are retired and living on a fixed income. When prices rise these consumers cannot buy as much as they could previously. This discourages savings due to the fact that the money is worth more presently than in the future. This expectation reduces economic growth because the economy needs a certain level of savings to finance investments which boosts economic growth. Also, inflation makes it harder for businesses to plan for the future. It is very difficult to decide how much to produce, because businesses cannot predict the demand for their product at the higher prices they will have to charge in order to cover their costs. High inflation not only disrupts the operation of a nation's financial institutions and markets, it also discourages their integration with the rest of the world's markets. Inflation causes uncertainty about future prices, interest rates, and exchange rates, and this in turn increases the risks among potential trade partners, discouraging trade.

As far as commercial banking is concerned, it erodes the value of the depositor's savings as well as that of the bank's loans. The uncertainty associated with inflation increases the risk associated with the investment and production activity of firms and markets (Diamond, 1967).

The effect of inflation on investment occurs directly and indirectly. Inflation increases transactions and information costs, which directly inhibits economic development. For example, when inflation makes nominal values uncertain, investment planning becomes difficult. Individuals may be reluctant to enter into contracts when inflation cannot be predicted making relative prices uncertain. This reluctance to enter into contracts over time will inhibit investment which will affect economic growth. In this case inflation will inhibit investment and could result in financial recession (Hellerstein, 1997).

According to Blume (1978), sustained inflation is damaging to long-run growth and the financial system in general. Increases in inflation lead to lower real returns not just on money, but on all other assets too. These low returns interfere with the functioning of financial markets and the allocation of investment. Lower real returns have the effect of severely damaging the credit market. As a result, higher inflation contracts the supply of credit available to fund capital investment damaging the economy.

According Benderly (1985), the rate of growth fell slightly as the rate of inflation moved up to 20-25 percent. The average rate of growth rose as the rate of inflation rose from negative or low inflation to 15-20% in a study on economic growth and inflation of 127 countries between 1962 and 1992. The finding was however disputed by Easterly (1998), who argued that there was a negative relationship between inflation and economic growth especially with high inflation rates.

Huybens (1999), noted that sustained and predictable high rates of inflation can have adverse consequences either for an economy's long-run rate of real growth or for its long-run level of real activity. Even predictable increases in the rate of inflation interfere with the ability of the financial sector to allocate resources effectively. Informational asymmetries in credit markets and increases in the rate of inflation adversely affect credit market frictions with negative repercussions for financial sector (both banks and equity market) performance and therefore long-run real activity.



Given the feature of informational friction whose severity is endogenous, increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity diminishes with adverse implications for capital investment. The reduction in capital formation negatively influences both long-run economic performance and equity market activity, where claims to capital ownership are traded (Huybens, E., 1999)

A study by Smith (1997), emphasizes that only when inflation exceeds certain “critical” rates do informational frictions necessarily play a substantial role. When inflation is very low, credit market frictions may be “nonbinding,” so that inflation does not distort the flow of information or interfere with resource allocation and growth. However, once the rate of inflation exceeds some threshold level, credit market frictions become binding, and there is a discrete drop in financial sector performance as credit rationing intensifies. These models further predict the existence of a second threshold rate of inflation. Once inflation exceeds this threshold, perfect foresight dynamics are associated with endogenous oscillation in all variables, so that inflation is highly correlated with inflation variability and asset return volatility.

According to Choi and Smith (1997), in some cases, once the rate of inflation exceeds this critical level, perfect foresight dynamics do not allow an economy to converge to a steady state displaying either an active financial system or a high level of real activity. When this occurs, further increases in inflation have no additional detrimental effects on the financial system. Thus, in effect, these models imply that once the rate of inflation reaches a certain critical threshold, “all of the damage to the financial system has already been done.” Further increases in inflation will have no additional consequences for financial sector performance or economic growth.

According to Talmor (1989), effect of inflation on stock market was also evident from the fact that it increases the rates of interest i.e. if the inflation rate is high, the interest rate is also high. In the wake of both (inflation and interest rates) being high, the creditor will have a tendency to compensate for the rise in interest rates. Therefore, the debtor has to access loans at a higher rate. This played a significant role in prohibiting funds from being invested in stock markets.

According to Tadas (1995), when the government has enough funds to circulate in the market, the cost of goods, services usually go up. This leads to the decrease in the purchasing power of individuals. The value of money also decreases. In a nut shell, for the economy to flourish, inflation and stock market ought to be more conforming and predictable.

According to Cecchetti (2000), movements in certain economic and financial market variables are thought to presage changes in the Consumer Price Index and other broad inflation measures. Increases in these measures either in their level or in their rate of growth are frequently linked to higher inflation. Financial indicators, such as exchange rates, monetary aggregates, and CPI are indicators of inflation. A decline in the exchange rate, faster growth of the monetary aggregates, and rise in CPI are all supposed to signal increasing inflation. Higher capacity utilization and lower unemployment are regarded as signs that inflation is on the rise.

According to Odera (2012), Index numbers are applied in the measurement of movements at the stock market. An Index number effectively summarizes hundreds of price movements. There are both price and volume index. The volume of shares traded might be as important as the change in a market index since substantial price increases and decreases are often accompanied by heavy trading activity. To this extent a positive correlation between purely share price based index and volume based index is hypothesized. The volume of shares traded is the total number of shares traded on the Stock Exchange on a particular day, which together with the total value of all shares traded, (that is turnover) gives a measure of the amount of business activity on the Stock Exchange.

Countries around the world have achieved significant reductions in the general rate of inflation. For emerging economies, controlling inflation has been a high priority, and there needs to be an evaluation of economic reform on emerging stock markets (Omran, 2001), According to Green (1989), since the mid-1970s the annual inflation rate in Africa has averaged more than 15 percent, with many countries experiencing rates of 20 percent or more. Inflation rates of this magnitude have significant adverse effects on the financial sectors of African countries, particularly in the context of fixed nominal interest rates. Econometric analysis points strongly to monetary expansion as a major cause of inflation in African countries generally.



Exchange rate depreciation is also associated with higher inflation, although in some countries the domestic currency was depreciated to offset the effects of recent inflation, rather than being a cause of inflation.

In Kenya, inflation accelerated for the 12th consecutive month in December 2011 to stand at 19.72%. The continuous upward trend throughout 2011 was attributed to the high cost of raw materials as well as the high cost of electricity and other cooking fuel. In January 2011 the 12-month inflation increased to 5.4% from 4.5% in December 2010 (KNBS, 2011).

According to Omran (2001), market activity variables that can be measured are, the value of trade, the volume of trade, the number of transactions, the number of and the value of new issues including capital increases. While market liquidity will be best measured by the total value traded to market capitalization and the volume of shares traded to the volume of shares listed.

The study determines how the rate of inflation affects the stock market performance in terms of market liquidity and market activities.

## **1.2 Statement of the problem**

Since the rate of inflation means an increase in the general level of prices, and since common stocks are considered as capital goods, then the stock prices should move with the general level of prices. So, when the general inflation rate increases, common stocks are also expected to increase to compensate investors for the decrease in the value of money. In this framework, it is expected that there is a positive relationship between the inflation rate and stock prices/returns. However, past empirical studies demonstrated a negative relationship between the inflation rate and stock returns. It is apparent that most of the research studies in this area have been done in the developed markets with very little evidence for emerging markets particularly in developing countries such as in Kenya. Furthermore, it is important to observe that these empirical studies have concentrated mainly on stock prices and returns as indicators of stock market performance. However, it can be argued that the changes in the inflation rate may also affect other aspects of stock market performance, such as market activity and market liquidity; in that spirit, this study examined these neglected aspects. This study therefore attempts to bridge the gap by investigating the effect of inflation on market activity and liquidity using the Nairobi Securities Exchange data.

## **1.3 Objectives of the study**

### **1.3.1 General Objective**

To determine the effect of inflation on the performance of Nairobi securities exchange in terms of market activity and market liquidity for the last five years between (2008 and 2013).

### **1.3.2 Specific Objectives**

- i. To determine the effect of inflation on the value of shares traded at the NSE.
- ii. To determine the effect of inflation on volume of shares traded at the NSE.
- iii. To determine the effect of inflation on the total value of shares traded to market capitalization.

## **1.4 Research Hypothesis**

$H_0 : \beta_1 = 0$  Rate of inflation has no effect on the value of shares traded at the NSE.

$H_0 : \beta_2 = 0$  Rate of inflation has no effect on the volume of shares traded at the NSE.

$H_0 : \beta_3 = 0$  Rate of inflation has no effect on the total value of shares traded to market capitalization at the NSE

## **1.5 Justification of the study**

This study adds to the body of knowledge on how inflation affects stock market performance. It also gives insight to the management of NSE to mitigate the effects posed by the inflation. In addition, the study is important to investors as it gives them insight on such negative effects. On another hand, the project forms a basis for further research work to researchers.

## **1.6 Scope of the study**

The study sought to determine effect of inflation on the performance of Nairobi Securities Exchange, in terms of the value of the share traded, the volume of the share traded and the total value of the share traded to market capitalization. The results of the study as well as recommendation for the future provide a clear understanding of the effects of inflation on the performance of Nairobi Securities Exchange between 2008 and 2013.



## 1.7 Conceptual frame work

A conceptual framework is a theoretical explanation of research problem. It is an explanation of the relationship among several factors that have been identified as important to the problem. The theory is developed by reviewing previous studies related to or of the problem (Konthari, 2004).

This study was based on the conceptual Framework of relationships between dependent variables and Independent variable. Variables are the conditions or characteristics that the experimenter manipulates, controls or observes (Best and Kahn, 2004).

### Independent Variable

Inflation

### Dependent Variable

#### Stock Market Performance

- Value of shares traded
- Volume of shares traded
- Value of share traded to market capitalization

Figure 1.1: Conceptual Framework

Source: Adopted from Farma's seminal paper (1981)

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

The Nairobi Security Exchange (NSE) is the principal stock exchange of Kenya. It began in 1954 as an overseas stock exchange while Kenya was still a British colony with permission of the London Stock Exchange. The NSE is a member of the African Stock Exchanges Association. It is Africa's fourth largest stock exchange in terms of trading volumes, and fifth in terms of market capitalization as a percentage of GDP. The Exchange works in cooperation with the Uganda Securities Exchange and the Dar es Salaam Stock Exchange, including the cross listing of various equities ([www.nse.co.ke](http://www.nse.co.ke), 29 sept 2013).

Two indices are popularly used to measure performance. The NSE 20-Share Index has been in use since 1964 and measures the performance of 20 blue-chip companies with strong fundamentals and which have consistently returned positive financial results. Included in the Index Britam, Express Kenya, Rea Vipingo, Sasini Tea, CMC Holdings, Kenya Airways, Safaricom, Nation Media Group, Barclays Bank Kenya, Equity Bank, Kenya Commercial Bank, Standard Chartered Bank, Bamburi Cement, British American Tobacco, Kengen, Centum Investment Company, East African Breweries, EA Cables, Kenya Power & Lighting Company Ltd. and Athi River Mining. This index primarily focuses on price changes for these 20 ([www.wikipedia.com](http://www.wikipedia.com), 29 sept 2013).

In 2008, the Nairobi Securities Exchange All Share Index (NASI) was introduced as an alternative index. Its measure is an overall indicator of market performance. The Index incorporates all the traded shares of the day. Its attention is therefore on the overall market capitalization rather than the price movements of select counters. There is however a third Index; the AIG 27 Index that compares price movements of 27 companies identified as relatively stable. The rationale behind the index compares to that of the NSE 20-Share Index. But whereas the AIG is primarily defined by the AIG company (a financial service company and part of the AIG Group), the 20-share Index is from the NSE itself ([www.wikipedia.com](http://www.wikipedia.com) 29 sept 2013).

### 2.2 Theoretical Review

Greenwood (1997), show that stock markets lower the cost of mobilizing savings, facilitating investments into the most productive technologies. According to Obstfeld (1994), international



risk sharing through internationally integrated stock markets improves resource allocation and accelerates growth. Zervos (1998), have argued that stock market liquidity i.e. the ability to trade equity easily plays a key role in economic growth. Although profitable investments require long run commitment to capital savers prefer not to relinquish control of their savings for long periods. Liquid equity markets ease this tension by providing assets to savers that are easily liquidated at any time, while principles (owners) and agents (managers), thereby spurring efficient resource allocation and economic growth.

According to Omran (2001), market activity variables that can be measured are, the value of trade, the volume of trade, the number of transactions, the number of and the value of new issues including capital increases. While market liquidity will be best measured by the total value traded to market capitalization and the volume of shares traded to the volume of shares listed. Schwert (1977), argue that stock market performance can also be measured by the return of investments to the investors. High return to investors implies that the stock market is well performing while low return implies poor performance.

### **2.2.1 Fishers theory**

Shares are hedged against inflation in the sense that an increase in expected inflation leads to a proportional change in nominal share returns. Fisher (1911), however, the Fisher theory has not gone unchallenged. Using data for the postwar period, several authors have found that share returns are not hedged against inflation and use these results as evidence against the Fisher hypothesis. Following the seminal paper of Fama (1981), it has been generally acknowledged that share returns are not simply a function of expected inflation but also of expected income growth. Fama suggests that expected inflation proxies' income growth in a regression of share returns on expected inflation, thus leading to an omitted variable bias. Accommodating expected income growth in the estimates of share returns. Fama (2007), find that the Fisher hypothesis cannot be rejected. However, recent empirical evidence suggests that the Fisher hypothesis does not hold, even when expected income growth is accommodated in the estimates (Balduzzi, 1995; Cochran and DeFina, 1993; Caporale and Jung, 1997).

### **2.2.2 Fama's proxy hypothesis**

Fama (1981), argued that the negative relationship between stock returns and inflation has its basis in the money-demand theory and the quantity theory of money. Fama hypothesizes that rising inflation rates reduce real economic activity and demand for money. When economic activity dips, it negatively affects the future corporate profits and hence, stock prices. The negative relationship between inflation and the stock returns is on account of the 'proxy effect' in the sense that it reflects the detrimental consequence of inflation on real economic activity. According to Fama, the statistical relationship between inflation and stock returns should disappear once the effect of real output growth is controlled for. The Reverse Causality hypothesis by Roll (1983), is another popular explanation of the negative correlation between inflation and stock prices, brings in fiscal and monetary linkages to explain the relationship between stock returns and inflation. According to this hypothesis, a reduction in real activity not only affects the stock prices adversely, but it also leads to a fall in government revenue and rise in fiscal deficits. Since the central bank monetizes a portion of fiscal deficits, the money supply increases, which in turn increases the inflation. Interestingly, findings of Spencer (1983), are at variance with that of both Fisher's and Fama's Hypotheses. They find a positive relationship between real activity and inflation, consistent with the conventional Phillips curve theory and a negative relationship between real activity and real stock returns. They also find that inflation "causes" real stock return unidirectional. Although numerous studies emerged on the topic, most of them concern with developed nations only a few studies analyzed this issue in the context of developing countries with relatively nascent stock markets and potentially unique transmission.

### **2.2.3 Inflation and money illusion theory**

The term money illusion refers to the phenomenon where people confuse nominal with real magnitudes. First, it is related to the literature on money illusion, which dates back to the early 20th century. Fisher, (1928), defines money illusion as "the failure to perceive that the dollar, or any other unit of money, expands or shrinks in value." Leontief (1932), defines that there is no money illusion if demand and supply functions are homogeneous of degree zero in all nominal prices. This is what Leontief (1936), called the "homogeneity postulate." Beginning with Haberler (1941), other writers have used the term money illusion as synonymous with a violation of this homogeneity postulate. Patinkin (2002), objects this use on the grounds that it fails to take



into account the real balance effect. Patinkin (1965), defines that “an individual will be said to be suffering from such an illusion if his excess-demand functions for commodities do not depend solely on relative prices and real wealth.”

#### **2.2.4 Efficient market hypothesis**

Generation ago, the efficient market hypothesis was widely accepted by academic financial economists; for example, see Eugene Fama's (1970), influential survey article, “Efficient Capital Markets.” It was generally believed that securities markets were extremely efficient in reflecting information about individual stocks and about the stock market as a whole. The accepted view was that when information arises, the news spreads very quickly and is incorporated into the prices of securities without delay. Thus, neither technical analysis, which is the study of past stock prices in an attempt to predict future prices, nor even fundamental analysis, which is the analysis of financial information such as company earnings and asset values to help investors select “undervalued” stocks, would enable an investor to achieve returns greater than those that could be obtained by holding a randomly selected portfolio of individual stocks, at least not with comparable risk. The efficient market hypothesis is associated with the idea of a “random walk,” which is a term loosely used in the finance literature to characterize a price series where all subsequent price changes represent random departures from previous prices. The logic of the random walk idea is that if the flow of information is unimpeded and information is immediately reflected in stock prices, then tomorrow's price changes will reflect only tomorrow's news and will be independent of the price changes today. But news is by definition unpredictable, and, thus, resulting price changes must be unpredictable and random. As a result, prices fully reflect all known information, and even uninformed investors buying a diversified portfolio at the tableau of prices given by the market will obtain a rate of return as generous as that achieved by the experts.

## 2.2.5 Determinants of Stock Market Returns

In the last three decades, interactions between capital market and macroeconomic variables have been an issue among financial economists and practitioners, Omole & Christopher, (2012), argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, gross domestic product (GDP), exchange rate, inflation and money supply. Christopher *et al* (2006), opined that macroeconomic variables can influence investors' investment decision and motivates many researchers to investigate the relationships between share returns and macroeconomic variable. Favorable macroeconomic policies are expected to impact positively on market and vice versa; which might be instantaneous, lagged or even anticipatory. Central authorities set macroeconomic performance targets every fiscal year and these targets are usually tied to two principal macro policy frameworks (fiscal and monetary). The regulatory agencies in Kenya have instituted numerous policies to stabilize the macroeconomic variables which had little impact on the Kenyan capital market. They are expected to interact to ensure that government achieves its macroeconomic goals of general increase in output growth, promoting price stability, stable exchange rate, employment growth. The key macroeconomic indicators are: GDP, inflation rate, interest rate (both Treasury bill and lending rate), money supply and exchange rate are not the only determinant of stock prices movement. Other factors (non-macroeconomic variables) that affect the stock prices and the general trend of the market are seasonal variation, enlightenment of the investment public or general awareness of the market, political and social crisis, investment motive, random behavior of investors, new listing of securities, individual investor's objective in the market (speculation or long-term investment), company's earnings release and activities of the market regulator.

## 2.3 Empirical Review

The negative relationship between inflation and the stock returns is on account of the 'proxy effect' in the sense that it reflects the detrimental consequence of inflation on real economic activity. Statistical relationship between inflation and stock returns should disappear once the effect of real output growth is controlled for. A reduction in real activity not only affects the stock prices adversely, but it also leads to a fall in government revenue and rise in fiscal deficits



Under efficient capital markets, it is generally believed that securities markets are extremely efficient in reflecting information about individual stocks and about the stock market as a whole. The accepted view is that when information arises, the news spreads very quickly and is incorporated into the prices of securities without delay. It's argued that stock prices are determined by some fundamental macroeconomic variables such as the interest rate, gross domestic product (GDP), exchange rate, inflation and money supply. Empirical evidences from the financial press indicate that investors generally believe that monetary policy and macroeconomic events have a large influence on the volatility of the stock price. Favorable macroeconomic policies are expected to impact positively on market and vice versa

A negative relation between stock prices and inflation has been consistently observed in U.S. data. In a comprehensive study, Fama and Schwert (1987), showed that stock returns were negatively related to expected inflation, unanticipated inflation, and changes in expected inflation. The failure of the Fisherian model to explain the observed relation between stock prices and inflation has led to the development of alternative macro-economic theories. Geske and Roll (1993), have argued that the basic underlying relation is between stock returns and changes in inflationary expectations. Prior to Geske and Roll (1993), the conventional view has been that changes in inflationary expectations were the causative influence.

Inflation creates a major problem for analyzing stock market returns over a long period of time. In the United States where inflation has averaged between 2 percent and 5 percent for most years since World War II, the inflation creates a natural bias in the performance of the stock market. Almost every country in the world suffered their worst stock market declines as measured in real values, during a period of high inflation or hyperinflation as stocks and the other financial assets failed to keep up with the increases in the prices of goods. In addition, also creates extreme volatility in stock market return. If the government lacks of the power to resolve the inflation, the stock will collapse in value. Stock can be losing over 95 percent of their real value. Moreover, history has shown that in periods of inflation, dividends rarely keep with increase in consumer prices and dividend decline in real term, further reducing investor total return as argued by (Taylor 1996).

According to School of Management Shanghai University of Engineering Science, Study on the Impact of Inflation on the Stock Market in China, a careful analysis of China in the past ten years, China's inflation rate basically is kept below 3%. So the overall stock market is relatively stable. In 2007, Chinese economy began to have new change that inflation in the high of 4.8%. In view of this situation, the central bank began a new policy to bring inflation down. This period the stock market was volatile, in the beginning of the second quarter of 2008, inflation showed a downward trend, but then the economic growth rate slows down. The new situation for the stock market generates new challenges. Since then, China's inflation and stock market showed negative correlation significantly. In 2011, China's monetary policy has fine-tuning again, which is from "moderately loose monetary policy" to "prudent monetary policy"

According to American Economic Review (2010), inflation and stock market, when the rate of inflation is higher, share prices increase at a faster rate. More specifically, when the inflation rate is steady, share prices rise in proportion to the price level to maintain a constant ratio of share prices to real earnings. In contrast, an increase in the expected future rate of inflation causes a concurrent fall in the ratio of share prices to current earnings; the ratio of share prices to real earnings is permanently lower. This permanent reduction in the price-earnings ratio occurs because; inflation raises the effective tax rate on corporate source income.

Douglason (2009) studied the relationship between Inflation and Stock Market Returns evidence from Nigeria. The study observed that Inflation rate for example, rose markedly in the fourth quarter of 2008 reaching a 3-year high of 15.1 per cent in December from its single digit level of 7.8 per cent at end of March, 2008. Precisely, the inflation rate was 6.5 per cent in December 2007. The inflationary pressure which continued into 2009 as some sources have it (notably the Central Bank of Nigeria, 2009), may have been attributed to rising food prices, inefficient and poor transport services, port congestion, depreciation of the naira and the rush to spend budgetary allocations by government agencies before fiscal year end Sampson (2009). During the same periods, the Nigerian capital market experienced a bullish trend when it started the year 2008 at 58,580 (with a market capitalization of N10.284 trillion), and went on to achieve its highest value ever of 66,371 on March 5, 2008, with a market capitalization of about N12.640 trillion Aluko (2008). The capital market has since the March 5 to October, 2008 lost about



N3.38 trillion, over 26.7 percent; as market capitalization stood at N9.11 trillion. Nigeria equally faced a major decline in portfolio equity flows perceived to be correlated with the sharp fall in stock market. For instance, foreign portfolio investors withdrew \$15 billion from the Nigerian capital market in January 2009 Ajakaiye (2009). The All Share Index (ASI) consequently shed a total share of 67 per cent from March 2008 to March 2009.

## 2.4 Overview of Capital Markets

Capital markets are markets where people, companies and governments with more funds than they need transfer those funds to people, companies or governments who have a shortage of funds. Stock and bonds markets are the two major capital markets. Capital markets promote economic efficiency by channeling money from those don't have viable economic investments to those who do.

According to Eakins (2003), Primary issuers of capital markets securities are federal and local corporations and governments. The federal governments issues long term notes and bonds to finance national debt. State and municipal governments also issue long term notes and bonds to finance capital projects, such as school and prison construction. Government never issue stock because they cannot sell ownership claims.

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Corporations issue bond and stocks. One of the most difficult decisions that face a firm is whether to finance long term growth through debt or equity. The distribution of a firm's capital between debt and equity is known as capital structure. The largest purchase of capital securities are household deposit funds in financial institutions such as mutual funds and pension funds, which use the funds to purchase capital market instruments such as bonds and stocks (Chen, 1986).

Capital market securities fall under three categories, bond, stocks and mortgages. Bond is a specific amount at a determined future date generally with periodic dates. The par value or the maturity value is one that the issuer must pay. This rate is usually fixed for duration of the bond and does fluctuate with market interest rates. If the repayment terms of the bond are not met, the holder has claims on the asset of the issuer. Long-term bonds traded in the capital markets include long-term government notes and bonds and corporation bonds (Henning *et al.*, 1975).

A stock is a share represents a share of ownership. A stock owner owns a percentage of interest in a firm, consistent with the percentage of the outstanding stock held. Investors can earn return in two ways; either the price of the stock or the firms pays to stockholder dividends. (Mishkins and Eakins, 2003).

There are two types of stocks, common and preferred stocks. According to Henning, (1975) common stocks features of being perpetual, has voting rights in the companies that issue them, residual claim on all assets and incomes, has ownership status in the firm and can provide returns to the investors through dividends and capital gains. Mishkins and Eakins, (2003) defined preferred stock as a form of equity from a legal and tax standpoint, preferred stockholders do not vote unless a firm has failed to pay promised dividend.

According to Henning (1975), Mortgage markets are long-term loan secured by real estate. A developer may obtain a mortgage loan so as to finance the construction of office building or a family may obtain a mortgage loan to finance the purchase of a home. In either case the loan is amortized to the borrower who will then pay it over time in some combination of principal and interest payments that result of the debt by maturity.

Funds invested in capital markets are used to invest in assets that will help generate revenues over an extended period of time. Some common uses are building where a new product will be produced, equipment that is needed to produce the new product and trucks for shipping product.

Borrowing long-term in the capital markets overcomes interest rate uncertainties, but a cost of a higher interest rate for the life of the loan (Cooper & Schindler, 2003).

## **2.5 History of Stock Market in Kenya**

Dealing in shares and stocks started in Kenya in the 1920s. At this time, Kenya was a British colony. Stock broking was conducted solely by Europeans in areas of specialization such as accountants, auctioneers, estate agents and lawyers who met to **exchange prices over a cup of coffee**. Trading took place on gentlemen's agreement in which standard commissions were charged and clients were obliged to honor their contractual commitments such as making good delivery and settling relevant cost. There was no formal market, rules or regulations to govern stock broking.



Francis Drummond, an estate agent, established the first professional stock broking firm in 1951. He impressed upon Sir Ernest Vasey, the Finance Minister of Kenya at the time, the need to set up a stock exchange in East Africa. In July 1953, Sir Ernest Vasey and Francis Drummond made the proposal to the London Stock Exchange officials who accepted and recognized the establishment of the Nairobi Securities Exchange (NSE) as an overseas stock exchange.

In 1954, the NSE was constituted as a voluntary association of stockbrokers registered under the Societies Act. Africans and Asians were not permitted to trade securities at the NSE. Business was conducted by resident Europeans only until 1963 when Kenya attained independence from Britain. Before 1963, there were about 10 listed companies. Activity at the stock market slumped at the dawn of Kenya's independence due to uncertainty about Kenya's economic future. However, the first three years of independence were marked by steady economic growth and the restoration of confidence in the market, with the result that the NSE handled a high number of subscriptions of public issues.

By 1966, the NSE had begun measuring daily trading activity by computing the NSE Index. The index measured daily average price changes in 17 companies that were considered the most active stocks in the market. It was computed as a weighted average of price changes in the selected stocks and 1966 was used as the base year and set at 100 points.

The 1970s saw about 20 more companies listed on the NSE. This was the largest number of companies listed in a span of about a decade. The 1972 oil crisis dealt a blow to this growth due to the depression of share prices arising from inflation. In 1975, a 35% Capital Gains Tax was introduced, leading to further losses experienced by the NSE. Other factors that negatively affected the NSE include the nationalization and compulsory acquisition of companies quoted or subsidiaries of companies quoted at the NSE by Tanzania and Uganda, introduction of exchange controls and introduction of inter-territorial restrictions among the East African countries.

The 1980s recorded five new companies listed. In 1984, the Government of Kenya through the Central Bank of Kenya in conjunction with the International Finance Corporation (IFC) conducted a study dubbed "Development of Money and Capital Markets in Kenya". This study became a blue print for structural reforms in Kenya's financial markets and culminated in the

establishment of the Capital Markets Authority (CMA) in 1989 as a regulatory body that would enable the development of Kenya's capital markets and the creation of a conducive environment for economic growth.

In 1988, the first privatization through the NSE was implemented when the government sold 20% of its stake at the Kenya Commercial Bank. The 1990s saw ten more listed companies. In 1991 NSE was registered under the Companies Act and also adopted a 20-share index and changed the computational method of the index to a geometric mean. On February 18, 1994 the NSE recorded an all record high of 5030 points on the 20-Share Index. The number of stockbrokers also increased from six to fourteen when eight more were licensed. Subsequently, the IFC rated the NSE as the best performing market in the world with a return of 179% in dollar terms.

In 1995, the government made changes with regard to the restrictions on foreign ownership of local companies from an aggregate limit of 20% and an individual limit of 2.5% to 40% and 5%, respectively with an objective of encouraging foreign portfolio investments. The Exchange Control Act was repealed. Seven more brokers were licensed, increasing the total to twenty brokers. Rates of commission were reduced from 2.5% to between 2% and 1% for equities and 0.05% for fixed interest securities. NSE had its largest share issue in 1996 when the Kenya Airways was privatized. About 110,000 shareholders acquired a stake in the airline. In 1998, a number of incentives were introduced by the government to encourage foreign investment such as tax-free Venture Capital Funds, removal of Capital Gains Tax on investments by insurance companies and allowance of beneficial ownership by foreigners in local stockbrokers and fund managers.

In 2000, Kenya, Uganda and Tanzania signed the Joint Stock Exchange Taskforce report on cross border listing. Subsequently, the East African Breweries Ltd. and the Kenya Airways proceeded to cross list at the Kampala and Dar es Salaam Stock Exchanges. In 2001, NSE was categorized into three market segments namely, the Main Investment Market Segment (MIMS), Alternative Investment Market Segment (AIMS) and Fixed Income Securities Market Segment (FISMS). The first rights issue under the AIMS was implemented in February 2001.



New foreign investor regulations were enacted in 2002. They provided that there would be a 25% minimum reserve of the issued share capital for locals while the balance of the 75% would be for all types of investors. A local investor is defined as an individual who is a citizen of Kenya, a company incorporated under the Companies Act of Kenya or any other body corporate established or incorporated in Kenya under the provision of any law in which Kenya citizens or the Government of Kenya have beneficial interest in 100% of its ordinary shares.

In 2002, an agreement was reached for the establishment of the Central Depository and Settlement Corporation (CDSC). The CDSC is the legal entity that owns the automated clearing, settlement, depository and registry system (CDS). In Kenya the NSE is regulated by the Capital market authority ([www.nse.co.ke](http://www.nse.co.ke) 29 sept. 2013).

## **2.6. Challenges facing the Kenyan Capital Market**

Financial system is a mechanism through which loanable funds reach borrowers. Through the operations of the financial markets, money is exchanged for financial claims in form of stocks, bonds and securities. Through the exchange of money and claims economic production is increased. This is because the capital markets provide money needed for investments. According to Wambui (2001), the following are challenges affecting capital markets and the financial system;

### **Market Risk**

This is the risk associated with uncertainty of a financial institution's earning on its trading portfolio caused by the changes in the market conditions such as price of an asset, interest rates, market volatility and market liquidity. Income from trading activities is increasing replacing income from traditional financial institution activities of deposit taking and leading. The resulting earning can be measured over periods as short as a day or as long as a year.

### **Increasing Listing at the NSE**

Over the last fifteen years, the number of stocks traded at the NSE has stagnated at around 65 quoted companies. Currently, there are forty-seven (53) listed companies in the MIMS and

AIMS and four (7) in the FISMS in contrast to the hundreds of companies incorporated in Kenya. The NSE has not had an initial public offering since 2013 when the government divested part of its holding in two companies (Mumias Sugar Company and the ICDC Investment Company). The divestiture was not fully subscribed with both issues having a 60% and 64% success rate. The limited supply of new equities in the capital market has restricted the use of the equity market as a source of financing. In view of the past failure to attract new equity, the most difficult hurdle for the NSE is increasing the number of medium-sized and large family-owned businesses and state-owned companies operating in Kenya listed at the NSE.

Generally, the main factors limiting the supply of equities include the reluctance of small, family-owned businesses to dilute ownership, the costly and tedious process of making public offers and the perception by many eligible companies that the risks associated with additional disclosure are not adequately compensated by additional returns.

In addition the government put on holds its privatization program to facilitate the formulation of a sound legal framework to facilitate the privatization process.

When companies are considering whether to list their securities at the NSE, the factors inducing listing include: Access to cheaper sources of financing, Suitability of the NSE as a vehicle for trading equity and the opportunity to share the risks associated with sourcing capital.

On the other hand the factors inhibiting listing include: disclosure of information seems to be a major impediment to listing at NSE, The risks associated with additional disclosure are perceived to be inadequately compensated by additional returns, some unlisted companies consider the cost of disclosure not commensurate with benefit accrued by listing, the dual role played by commercial banks in Kenya as investment advisors and lenders has indirectly discouraged the use of the stock exchange as a means of raising capital, since banks do not require public disclosure of a company's affairs like the NSE does, many firms prefer to remain unlisted and source their capital from the banks, fear of loss of control by opening up firms to public ownership particularly by family owned companies. And other inhibitors include limited diversity of products at the NSE to attract eligible firms. Currently, the market provides firms with the option of trading in ordinary and preference shares, commercial papers, government bonds and corporate bonds. More firms may opt to list on the NSE if other products are



introduced such as futures and options market, an over-the counter (OTC) market, and trading in asset-backed securities, the ability of firms to raise start-up capital from own savings and loans from domestic commercial banks and foreign sources . A study conducted in Kenya using a sample of twenty-four unlisted companies, indicated that about 60% of the firms used private savings as start-up capital for their business, 12% obtained loans from commercial banks while about 4% obtained loans from foreign sources. Finally, stringent listing requirements before an entity can qualify for listing have contributed to the elimination or disqualification of many business enterprises and inadequate marketing of the NSE to eligible companies.

NSE is considered a more liquid and active market than those of its East African counterparts (Uganda and Tanzania) and in sub-Saharan Africa in general. However, by international standards, it is small, illiquid and volatile with regard to price and returns. Low liquidity is particularly evident in the secondary bonds and equity markets. The NSE is a highly concentrated market with most of its activity centered on a few listed companies. Out of the 66 equities listed in NSE, about 29 companies are regularly traded. Trading on securities from the remaining companies is haphazard and irregular. The low turnover ratio, which is less than 15%, may be attributed to the limited floatation of shares as only about 35% of market capitalization is available for trading. In addition, there is a high incidence of "buy and hold" particularly among institutional investors who dominate the market. In 2002, institutional investors held 60% of equities listed at NSE.

### **Public Awareness**

Generally, there is lack of awareness and information on the role, functions and operations of the stock exchange and the CMA among potential investors and business entities. Many Kenyans throughout the country do not know enough about the NSE and the CMA, and the market does not seem to market itself sufficiently to potential investors or provide a variety of products to attract companies. This may be attributed to financial and human resource constraints. The lack of public awareness on NSE operations is a major hindrance to corporate participation in stock market.

## **Economic and Political Conditions**

Kenya experienced poor output performance with an average GDP growth of about 1.3% between 1997 and 2002. Listed companies experienced losses or low profits and individuals faced low income thereby resulting in low demand for equities. In addition, the foreign investors' turnover and net foreign inflow declined between 2000 and 2002 due to political and economic uncertainties thereby reducing the amount of foreign portfolio investment that had been attracted into the country in previous years.

## **Market Infrastructure**

The current manual trading system is slow, costly and limits the range of products that can be provided. It has also hindered international integration of the market. The fact that the NSE is not linked to other international markets outside East Africa has attracted some foreign investors because shocks in other international markets do not significantly affect the NSE. However, this separation limits the growth, liquidity and expansion of the market. Prior to November 2005, delivery and settlement of traded shares was conducted manually.

## **Interest Rates**

High real short-term interest rates have reduced the demand for capital market instruments and crowded-out substantial domestic savings to short-term government securities. This situation was particularly evident in 2001 when the Treasury bill (t-bill) rate was 12.6% compared to an inflation rate of 0.8%. However, the situation is being reversed as T-bill rates have fallen to about 8% resulting in increased demand for both equity and debt instruments. Interest rate spreads are high and currently standing at about 13%. Deposit rates are too low and lending rates too high thereby discouraging domestic savings and investment. The domestic savings are less than 10% of GDP and thereby insufficient to meet investment needs and generate demand for equities and debt instruments.

## **Bond Market**

Government bonds have dominated the debt market in the NSE. Until 2002, there was little trading in the bond market partly because institutional investors exhibited a "buy and hold" strategy. Since 2002 the issue of corporate bonds and the issue of longer-term government



treasury bonds has increased turnover in the bond market. Lack of suitable pricing benchmarks for pricing of corporate bonds and the absence of rating agencies has hampered the development of the corporate bond market. However, CMA recently accredited Duff and Phelps (South Africa) to offer rating services.

### **Insurance Industry**

The insurance industry has played a relatively smaller role in the capital markets than it is capable of doing because it is dominated by non-life companies whose liabilities are short-term and not suitable for investment in capital markets. Most of the reserves in the insurance industry have been utilized in short-term government securities and bank deposits. The few life insurance companies have utilized their reserves in real estate, T-bills and short-term bank deposits.

### **2.7 Types of Inflation**

First and most common is the Demand-pull Inflation, which occurs when total demand for goods and services in an economy exceeds the supply of the same. When the supply of goods is lower the prices of such goods will rise leading to the demand-pull inflation. Second and relatively common is Cost-push Inflation which occurs due to an increase in the cost of production of goods and services leading to a forceful increase in this prices of finished goods and services. For instance, a rise in the wages of laborers would raise the per-unit costs of production. another is pricing power inflation, more often called administered price inflation. This type of inflation occurs when the business houses and industries decide to increase the prices of their respective goods and services to increase their profit margins. Pricing power inflation does not occur at the time of financial crises and economic depression or when there is a downturn in the economy. This type of inflation is also called oligopolistic inflation because oligopolies have the power of pricing their goods and services at whatever levels they want. , Sectoral Inflation, takes place when there is an increase in the price of the goods and services produced by a certain sector of industries. For instance, an increase in the cost of crude oil would directly affect all the other sectors, which are directly related to the oil industry. Thus, the ever-increasing price of fuel has become an important issue related to the economy all over the world. Take the example of aviation industry. When the price of oil increases, the ticket fares also go up. This leads to a widespread inflation throughout the economy, even though it had originated

in one basic sector. If this situation occurs when there is a recession in the economy, there would be layoffs and it would adversely affect the work force and the economy in turn. Fiscal Inflation experienced when there is excess government spending. This occurs when there is a deficit budget. For instance, fiscal inflation originated in the US in the 1960s. At that time, Lydon Baines Johnson was the president of the US. America also faced fiscal type of inflation under the presidency of George W. Bush due to excess spending in the defense sector. Finally, Hyperinflation, also known as runaway inflation or galloping inflation. This type of inflation occurs during or soon after a war. This can usually lead to the complete breakdown of a country's monetary system. However, this type of inflation is short-lived.

## **2.8 Indicators of Inflation**

### **2.8.1 Consumer Price Index**

The Consumer Price Index measures prices of a selection of goods and services purchased by a "typical consumer". The inflation rate is the percentage rate of change of a price index over time. Two basic types of data are needed to construct the CPI, price data and weighting data. The price data are collected for a sample of goods and services from a sample of sales outlets in a sample of locations for a sample of times. The weighting data are estimates of the shares of the different types of expenditure in the total expenditure covered by the index. These weights are usually based upon expenditure data obtained from expenditure surveys for a sample of households or upon estimates of the composition of consumption expenditure in the National Income and Product Accounts. Although some of the sampling of items for price collection is done using a sampling frame and probabilistic sampling methods, many items and outlets are chosen in a commonsense way (purposive sampling) that does not permit estimation of confidence intervals. Therefore, the sampling variance cannot be calculated. In any case, a single estimate is required in most of the purposes for which the index is used (Odera, 1995).

The index is usually computed monthly, or quarterly in some countries, as a weighted average of sub-indices for different components of consumer expenditure, such as food, housing, clothing, each of which is in turn a weighted average of sub-sub-indices. At the most detailed level, the elementary aggregate level, detailed weighting information is unavailable, so indices are computed using unweighted arithmetic or geometric mean of the prices of the sampled product



offers. (However, the growing use of scanner data is gradually making weighting information available even at the most detailed level.) These indices compare prices each month with prices in the price-reference month. The weights used to combine them into the higher-level aggregates, and then into the overall index, relate to the estimated expenditures during a preceding whole year of the consumers covered by the index on the products within its scope in the area covered. Thus the index is a fixed-weight index, but rarely a true Laspeyres index, since the weight-reference period of a year and the price-reference period, usually a more recent single month, do not coincide. It takes time to assemble and process the information used for weighting which, in addition to household expenditure surveys, may include trade and tax data (Odera, 1995).

### **2.8.2 Exchange Rates**

A foreign exchange rate is the relative value between two currencies. In particular, the exchange rate is the quantity of one currency required to buy or sell one unit of the other currency.

### **2.8.3 Treasury Bills Interest Rate**

These rates are the daily secondary market quotation on the most recently auctioned treasury bills for each maturity tranche (4-week, 26-week, and 52-week) that treasury currently issues new bills ([www.investopedia.com](http://www.investopedia.com) 29 Sept 2013).

### **Inflation**

Inflation is a state in the economy of a country, when there is persistence increase in general price level of goods and services. To meet the required price rise, individuals have to dig deep from their pockets than is presumed. With increase in inflation, every sector of the economy is affected. Ranging from unemployment, interest rates, exchange rates, investment, stock markets, there is an aftermath of inflation in every sector. Inflation is bound to impact all sectors, either directly or indirectly. Inflation and stock market have a very close association. If there is inflation, stock markets are the worst affected ([www.investopedia.com](http://www.investopedia.com)).

### **Market Liquidity**

(Levine, 1996) have argued that stock market liquidity i.e. the ability to trade equity easily plays a key role in economic growth. Although profitable investments require long run commitment to capital, savers prefer not to relinquish control of their savings for long periods. Liquid equity

markets ease this tension by providing assets to savers that are easily liquidated at any time, while principles (owners) and agents (managers), thereby spurring efficient resource allocation and economic growth.

### **Market Activity**

According to Omran (2001), market activity variables that can be measured are, the value of trade, the volume of trade, the number of transactions, the number of and the value of new issues including capital increases.

### **2.9 Research Gap**

According to Omran (2001), most studies have concentrated more on the effect of inflation rate on investors return as an indicator of market performance little have being done on the effect of inflation rate on market liquidity and market activity to indicate market performance. It is with this view that has prompted this study on the effect of the rate of inflation on market liquidity and market activity.



## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

The study sought to determine the effects of inflation on the performance of Nairobi Stock Exchange. This chapter deals with the research methodology that will be used by the researcher towards the attainment of the objectives set out in chapter one. It specifically highlights the research methods that were used in carrying out the study in order to answer the research questions. In addition, various methodological issues such as population, sampling technique, sampling frame and size, data collection and analysis methods that will be adopted in the conduct of the study will be discussed.

### **3.2 Research Design**

A research design is a plan according to which one obtains research participants and collects information from them Mugenda (2001). This research adopted Correlational research design. Correlational research design describes data and characteristics about a population or phenomenon being studied Cooper and Schindler (2000). Correlational research is analytic and it focuses on the particular variables.

### **3.3 Target Population**

A population is made up of elements, individuals or objects about which a researcher wishes to describe or draw conclusion Byington (1997). The researcher's target population was the ordinary shares traded in the NSE, between 2008 and 2013

### **3.4 Scope of the Study**

The study is based on all the shares traded of the quoted companies in the Nairobi Securities Exchange between the year 2008 and 2013. The study analyses the effect of monthly change in inflation rate on the volume and value of shares traded in Nairobi Securities Exchange. The Nairobi securities exchange is the only securities exchange in Kenya and 4<sup>th</sup> in Africa in terms of market capitalization.

### **3.5 Data Collection Techniques**

The study conducted a census of the total population of all the shares traded of the quoted companies in Nairobi securities Exchange between the year 2008 to 2013 hence there was no sampling.

### 3.6 Data Collection Procedure

This refers to the means by which measure and facts are obtained from selected elements in a study. In this study secondary data collection methods were applied. This study made use of secondary data that was obtained from the NSE and the KNBS.

### 3.6 Data Analysis and Presentation

This process includes preparation of data. Correlation analysis was used to determine the degree of relationship between the different variables such as the relationship between inflation rate and the value of shares traded in the NSE in the last five years on monthly basis, rate of inflation and the volume of shares traded and the inflation rate and value of shares to market capitalization. Regression analysis was used to develop a model between the rate of inflation and variables such as value of shares traded in the NSE for the last five years on monthly basis, volume of shares traded, and the value of shares traded to market capitalization. Three simple regression models, specifically bivariate model were specified as follows,

$$Y_1 = a_1 + b_1 x_{1t} + u \text{-----Eq. 1}$$

Where:

$Y_1$  = Value of shares traded in shillings

$x_1$  = is the inflation rate in %

$u$  = is the error term

$$Y_2 = a_2 + b_2 x_{2t} + u \text{-----Eq. 2.}$$

Where:

$Y_2$  = Volume of shares traded

$x_2$  = Rate of inflation in %

$u$  = Error term



## CHAPTER FOUR: RESEARCH AND DISCUSSION

### 4.1 Introduction

In this chapter, an analysis of the data is done and results presented. The analysis involves the use of the secondary data obtained from the Nairobi Securities Exchange and Kenya National Bureau of Statistics. The analysis relied on the Microsoft (MS) Excel statistical package. The study aimed at establishing the effects of inflation on the performance of stock market.

### 4.2 Trends in the Market Performance

Various market performance variables were analyzed at different inflation rates and a trend determined thereof. The variables analyzed included: value of shares traded, Volume of shares traded and value of shares traded to market capitalization. The following graphs show the trends in market performance for the period studied.

#### 4.2.1 Effects of Inflation Rate on the Value of Shares Traded

Table 4.1 shows the value of shares traded in Shillings at different inflation rates for the last five years on monthly basis.

**Table 4.1 Summary of Value of Shares Traded at Different Inflation Rates**

Year		Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2008	X1	3.7	4.8	3	5.1	6.9	8.3	4	10.8	2.5	2.2	3.8	2.6
	Y1	1229	1134	13897	9779	9976	6524	11852	5826	15677	16578	12145.9	14782.7
2009	X1	3.8	5.8	3.9	5.8	7.9	2.9	2.8	7	6.7	12.9	2.8	10.3
	Y1	12897	953	1105	9546	6889	13481	13893	7567	6787	5799	13245.9	4724.3
2010	X1	4.3	5.7	6.9	8	4.8	2.8	9	2.7	9	10.7	4.8	4.7
	Y1	11763	952	9753	6278	1062	16971	5886.9	16972	5977	5776	10165.9	9211.8
2011	X1	4.6	4.9	3.5	7.8	6.4	3.8	5.8	7.4	8.6	7.9	12.1	11.8
	Y1	10988	987	12790	8765	9761	12289	9872.9	9567	9479	9346	6981.2	7526.9
2012	X1	6	5.2	4	3.7	3.9	4.2	3.6	3.8	3.2	3.4	3.8	4.5
	Y1	9965	997	11458	12117	12087	11569	12334	12781	12389	12896	12456.8	11245.9
2013	X1	5.4	6.6	9.2	12.1	13	14.5	15.5	16.7	18.5	19.5	20.1	21.5
	Y1	9876	9579	8762	5432.8	4890.9	4214.9	3987	3121.8	2891	2546	2233.8	1569

Y1 is the Value of shares traded in Shillings Billions.

X1 is the rate of inflation in percentage.

**Table 4.2 Mean inflation and Value of Shares Traded**

	2008	2009	2010	2011	2012	2013
Inflation	4.8	6.1	6.2	7.1	14.1	14.4
Value of Shares Traded	10986.6	18795.2	9111.9	8770.9	11773.1	4925.8

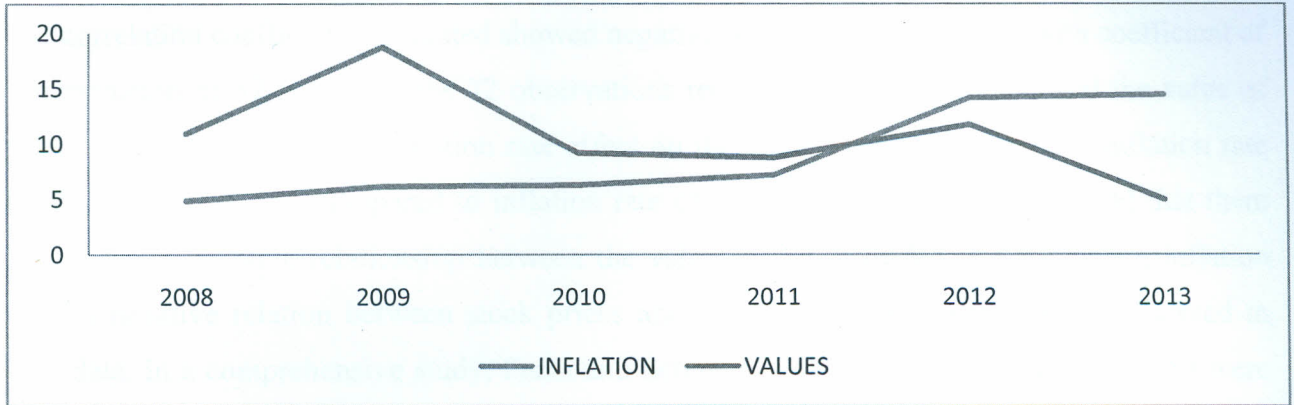


Figure 4.1: Trend of value of Shares Traded

The graph shows that the value of shares traded decreased as the rate of inflation increased. It is evident from the analysis that value of shares decreased most as the inflation rate went above ten percent. Generally, the value of shares decreased with an increase in the rate of inflation.

**Table 4.3 Regression of the Mean inflation and Value of Shares Traded**

Regression Statistics	
Multiple R	0.6134737
R Square	0.37635
Adjusted R Square	0.2204375
Standard Error	4071.9439
Observations	6

ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	40023455.72	40023455.72	2.413854049	0.195229833	
Residual	4	66322909.18	16580727.29			
	5	106346364.9				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>		<i>Lower 95%</i>	<i>Upper 95%</i>
Total	16132.188	3855.622255	4.184068507		5427.264116	26837.1111
	-759.47602	488.830798	1.553658279		-2116.687893	597.735859



**Table 4.4 Correlation Matrix**

	<i>Column 1</i>	<i>Column 2</i>
Column 1	1	
Column 2	-0.613473726	1

The correlation coefficient calculated showed negative relationship of -759.47 with coefficient of determination of 37.6% under the 72 observations recorded between inflation and the value of shares traded. Further weak inflation rate effect on the value of shares traded i.e. inflation rate below ten percent was compared to inflation rate of above ten percent, it was found that there was a strong negative relationship between the value of shares traded and the strong inflation rate. A negative relation between stock prices and inflation has been consistently observed in U.S. data. In a comprehensive study, Fama and Schwert (2003), showed that stock returns were negatively related to expected inflation, unanticipated inflation, and changes in expected inflation. Nigeria equally faced a major decline in portfolio equity flows perceived to be correlated with the sharp fall in stock market. For instance, foreign portfolio investors withdrew \$15 billion from the Nigerian capital market in January 2009. From the analysis it can be concluded that as inflation rate increases the value of shares traded decreases.

#### 4.2.2 Effects of Inflation rate on the Volume of shares traded

Table 4.5 shows the volume of shares traded at different inflation rates for the last five years on monthly basis.

**Table 4.5 Summary of Inflation Rate and Volume of Shares traded**

Year		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2008	X2	3.7	4.8	3	5.1	6.9	8.3	4	10.8	2.5	2.2	3.8	2.6
			107.			95.87		109.7					
	Y2	150	8	124	97.6	9	94.89	8	67.98	134.9	187.9	110.9	133.4
2009	X2	3.8	5.8	3.9	5.8	7.9	2.9	2.8	7	6.7	12.9	2.8	10.3
		111.9	91.7					122.2				123.7	
	Y2	8	8	111	85.9	78.98	128.9	3	87.89	97.98	64.89	8	72.98
2010	X2	4.3	5.7	6.9	8	4.8	2.8	9	2.7	9	10.7	4.8	4.7
		109.8	94.9			102.8	124.6		134.5			107.8	
	Y2	9	8	98.8	97.9	9	7	68.45	6	66.89	65.78	9	107.78

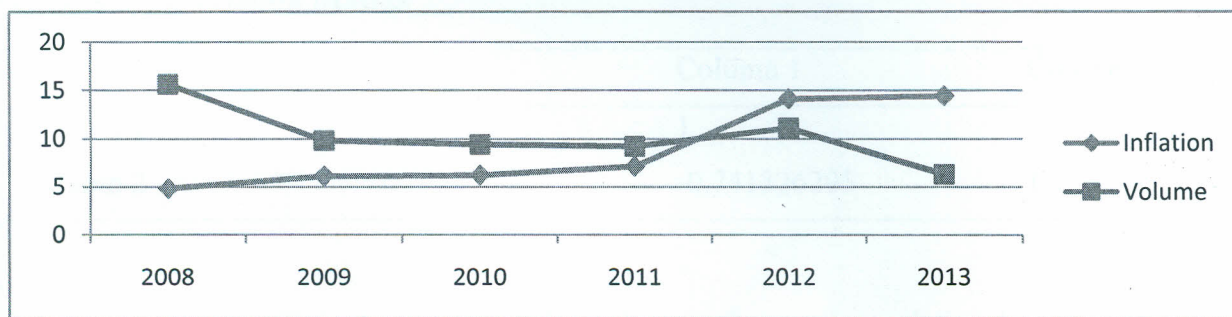
2011	X2	4.6	4.9	3.5	7.8	6.4	3.8	5.8	7.4	8.6	7.9	12.1	11.8
			104.				134.8						
	Y2	109.9	8	115	81.9	96.67	7	98.67	86.89	92.12	79.45	63.78	68.89
2012	X2	6	5.2	4	3.7	3.9	4.2	3.6	3.8	3.2	3.4	3.8	4.5
			99.8				112.6	112.3	110.5			111.6	
	Y2	98.78	7	111	113	95.78	7	4	6	142.3	117.9	7	110.56
2013	X2	5.4	6.6	9.2	12.1	13	14.5	15.5	16.7	18.5	19.5	20.1	21.5
			97.8										
	Y2	0	7	97.9	67.9	69.67	56.98	54.78	51.23	49.56	42.67	40.78	37.89

X2 is the inflation rate on monthly basis in percentage

Y2 is the volume of shares traded in numbers

**Table 4.6 Mean inflation and volume of shares traded**

	2008	2009	2010	2011	2012	2013
Inflation	4.8	6.1	6.2	7.1	14.1	14.4
Volume of Shares Traded	156.2	98.2	94.4	92.4	111.3	63.8



**Figure 4.2 Trend of Volume of Shares Traded**

The graph shows that the Volume of shares traded decreased as the rate of inflation increased. It is evident from the analysis that Volume of shares decreased most as the inflation rate went above ten percent. Generally, the Volume of shares decreased with an increase in the rate of inflation.



**Table 4.7 Regression of the Mean inflation and volume of shares traded**

<i>Regression Statistics</i>					
Multiple R	0.741326295				
R Square	0.549564675				
Adjusted R Square	0.436955844				
Standard Error	22.86981461				
Observations	6				
<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	2552.534653	2552.534653	4.880298192	0.09171393
Residual	4	2092.11368	523.0284201		
Total	5	4644.648333			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	145.8804218	21.6548577	6.736614196	85.75689813	206.0039454
X Variable 1	-6.065164653	2.745487154	-2.209139695	-13.68785902	1.557529716

**Table 4.8 Correlation Matrix**

	Column 1	Column 2
Column 1	1	
Column 2	-0.741326295	1

The correlation coefficient calculated showed a weak negative relationship of -0.5 between inflation and the Volume of shares traded. Further weak inflation rate effect on the volume of shares traded i.e. inflation rate below ten percent was compared to inflation rate of above ten percent, it was found that there was a strong negative relationship of -0.891 between the volume of shares traded and the strong inflation rate. According to ZhongqiangBaiSchool of Management Shanghai University of Engineering Science, Study on the Impact of Inflation on the Stock Market in China. China's inflation and stock market showed negative correlation significantly. In 2011, China's monetary policy has fine-tuning again, which is from "moderately loose monetary policy" to "prudent monetary policy. From the analysis it can be concluded that as inflation rate increases the volume of shares traded decreases.

**Table 4.7 Summary of Value of Shares Traded to market capitalization at Different Inflation Rates**

Year		Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov
2008	X2	3.7	4.8	3	5.1	6.9	8.3	4	10.8	2.5	2.2	3.8
	Y2	2.87	2.05	2.89	1.56	1.45	0.89	2.345	0.34	3.23	3.45	2.12
2009	X2	3.8	5.8	3.9	5.8	7.9	2.9	2.8	7	6.7	12.9	2.8
	Y2	2.1	1.34	2.97	1.39	1.02	3.12	2.98	1.56	1.12	0.12	3.12
2010	X2	4.3	5.7	6.9	8	4.8	2.8	9	2.7	9	10.7	4.8
	Y2	2.67	1.02	1.31	0.98	2.12	2.88	0.72	3.89	0.66	0.52	2.12
2011	X2	4.6	4.9	3.5	7.8	6.4	3.8	5.8	7.4	8.6	7.9	12.1
	Y2	2.76	2.01	2.78	1.12	1.67	2.13	1.67	1.87	1.23	1.56	0.33
2012	X2	6	5.2	4	3.7	3.9	4.2	3.6	3.8	3.2	3.4	3.8
	Y2	1.23	1.99	2.01	2.87	2.34	2.45	2.67	2.76	2.34	3.04	2.12
2013	X2	5.4	6.6	9.2	12.1	13	14.5	15.5	16.7	18.5	19.5	20.1
	Y2	1.11	0.98	0.56	0.12	0.11	0.09	0.08	0.078	0.065	0.056	0.034

Table 4.7 shows that the Value of shares traded to market capitalization decreased as the rate of inflation increased. It is evident from the analysis that Value of shares traded to market capitalization decreased most as the inflation rate went above ten percent.



## CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### 5.1 Summary

On the basis of the aims and objectives of this chapter is to discuss the summery, conclusions and recommendations of the effects of inflation on the performance of a stock market. The study had three objectives namely: establishing if there is any effect of inflation on value of share traded, establishing if there is any effect of inflation on the volume of shares traded, and establishing the effects of inflation on the value of shares traded to market capitalization.

The objectives mentioned above were achieved by analyzing the different variables at different inflation rates. The results revealed an expected behavior for the stock market response to the decrease in the inflation rate, and the results regarding overall performance seem to be consistent with the literature review, which stated that there is an inverse relationship between the inflation rate and both stock returns and prices. However, it needs to be pointed out that the focus of this study is on market activity and liquidity, not returns and prices. In fact, the news about the level of inflation can depress or encourage the stock markets.

The decrease in the inflation rate may give a good sign to investors to invest in the stock market, as it means that there will be an expansion in the business sector, in turn, the returns of companies will increase. In the meantime, with a decrease in the inflation rate, it is expected that interest rates will decrease as well, and this will encourage investors to establish new firms and to find the required finance with less cost. As a conclusion, all stock market variables benefited significantly from the changes in the inflation rate. From this analysis shown above, it can be concluded that the inflation rate, clearly, has had an impact upon stock market performance in terms of market activity and market liquidity. In fact, this relationship was negative and in the long run and short-run for all market activity and market liquidity variables except for the number of traded companies, in which case this relationship was in the long-run only.

### 5.2 Conclusions

#### 5.2.1 Effect of inflation on Value of Shares Traded

The analysis of correlation coefficient showed an inverses relationship between inflation and the value of shares traded, meaning that an increase in inflation lead to a decrease in the value of

shares traded. In addition to this the analysis also showed that the value of shares traded decreased sharply as the rate of inflation went above ten percent. This leads to the conclusion that inflation greatly affects the performance of inflation in terms of market activity.

### **5.2.2 Effect of Inflation on the Volume of Shares Traded**

Correlation coefficient results showed that inflation affects greatly the volume of shares traded this is most evident the rate of inflation went above ten percent.

### **5.2.3 Effect of Inflation on the Value of Shares Traded to Market Capitalization**

The analysis indicated that the above variable decreased sharply with the increase in the rate of inflation.

### **5.2.4 Effect of Inflation on the Overall Performance of Stock Markets**

The analysis showed that, the overall performance of the stock market is affected negatively by increases in the rate of inflation. However, their performance decreases greatly when the rate is above ten percent. In conclusion thus there is little effect of weak inflation on the performance of stock market great effect if seen as the inflation went above ten percent.

## **5.3 Recommendations**

Based on the findings and conclusions of this study, the following recommendations were derived. The government should introduce economic reform program with tight fiscal and monetary policies so as to keep the inflation rate at one digit. The NSE and the government should also introduce measure to reduce the negative effects of inflation on investors.

## **5.4 Areas for Further Research**

There is a need to look at the main causes of inflation so as to be able to introduce good economic reforms.



## REFERENCES:

- Benderly, J. (1985). Inflation, real balances, Output, and real stock Returns. *Economic Journal*, 21(75) Pg.1115-1123.
- Blume, M. (1978). Inflation and capital markets. *European Journal of Finance*, 811-829.
- Byington, C. a. (1997). *Methodological Issues in Empirical Cross-Cultural Research*. Springer.
- C.R., K. (2004). *Research Methodology, Methods and Techniques*.
- Cecchetti, C. a. (2000). The Unreliability of inflation indicators. *Journal of Economic Finance*, Volume 6.
- Chen, N. R. (1986). Economic Force and The Stock Market. *Business Journal*, 383-403.
- Cooper, D. R., & Schindler, P. S. (2003). *Business Research Methods*. Toronto, Canada: McGraw-Hill/Irwin.
- Diamond, A. (1967). Inflation and its Effects on Investments. *Journal of Finance*, 56-60.
- Eakins, M. a. (2003). *Financial Markets and Institutions*.
- Fama (1981), B. a. (2007). *The Profitability of Trading Rules and Volatility in Emerging Financial Markets*. Imaad Moosa A.
- Fama. (1981). *Stock Returns, Real Activity, Inflation, and Money*. American Economic Associaton.
- Fisher. (1911). *The Purchasing Power of Money*. Taylor & Francis, ltd.
- Fisher, I. (1928). *The Money Illusion*. Martino Fine Books, 2009.
- Green. (1989). Habit persistence and durability in aggregate consumption: Empirical tests. *Journal of Financial Economics*.
- Greenwood, J. a. (1997). Financial Markets in Development, and Development of Financial Markets. *Journal of Economic Dynamics and Control*.
- Hall, R. (1982). *inflation causes and effects*. chicago: press.
- Hellerstein. (1997). The impact of inflation on stock market performance in Nigeria. *American Journal Of Social And Management Sciences*.
- Huybens, E. (1999). Inflation, Financial Markets and Long-Run Real Activity. *Journal of Monetary Economics*, 53-71.

- J.Lintner. (1975). Inflation and security returns. *international journal of finance* 2, 30.
- Leontief, W. (1932). *Besides the Input-Output Model*.
- Levine, B. a. (1996). Stock Markets, Banks, and Economic Growth. *American Economic Review*, 537-558.linter. (n.d.).
- Mugenda, M. a. (2001). *Research Methods: Quantitative and Qualitative Approach*. Nairobi.
- Obstfeld, M. (1994). Risk Tking, Global Diversification and Growth. *American Economic Review*, VOL. 84,No. 5 pg. 1310-1329.
- Odera, O. (2012). Theoretical issues on the African Stock Markets and Portfolio. *Research Journal of Finance & Accounting*, Volume 3,No.3.
- Omole, 1., & Christopher Minsoo, H. a. (2012). Determinant of Stock Market Returns in Nigeria- A time Series Analysisi. *African Journal of Scientific Research*.
- Omran, M. a. (2001). Emerging Markets Review. *Finance Journal*, 263-279.
- Patinkin, W. (2002). The 'money-in-the-utility-function' Tradition. *The European Journal of the History of Economic Thought* , 268-292.
- Roll, G. a. (1983). Relations among Stock Returns, Inflation and Economic Activities. *Journal of Finance Economics*.
- Schwert, F. a. (1977). Assets Returns and Inflation. *Journal of Financial Economics*, 115-146.
- Smith, C. a. (1997). The Adverse Effects of High Inflation-Induced Uncertainty on Capital Accumulation. *Economic Journal*.
- Spencer, R. a. (1983). Causal Relations Among Stock Returns, Interest Rates, Real Activity, and Inflation . *The Journal of Finance*, 1591-1603 .
- Tadas, C. a. (1995). Expected Returns and volatility in stock markets in 135 countries. *Financial Journal*.
- Talmor, E. (1989). The Effects of Volatility Changes on the level of stock prices and subsequent expected returns. *The journal of finance*.
- Zervos, R. L. (1998). *Stock Markets, Banks, and Economic Growth*. America Economic Association



<http://www.shvoong.com/social-sciences-characteristics-developing-countries>.

Accessed 29 September 2013

Nairobi Stock Exchange-Accessed 29 September 2013