MACROECONOMIC VARIABLES, SECTORAL INDEX VOLATILITY, AND INVESTOR SENTIMENT AMONG LISTED FIRMS AT NAIROBI SECURITY EXCHANGE, KENYA

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INTERNATIONAL PEER REVIEWED
JOURNAL AND BOOK PUBLISHING

# MACROECONOMIC VARIABLES, SECTORAL INDEX VOLATILITY, AND INVESTOR SENTIMENT AMONG LISTED FIRMS AT NAIROBI SECURITY EXCHANGE, KENYA

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## Abstract

**Purpose:** From a broader perspective, it is generally accepted that every investor aims to maximize return on their investment. To achieve this, the security market has significantly attracted so much interest from numerous stakeholders around the globe. However, it is difficult to forecast the stock index volatility exhaustively since it is triggered by different factors, which erode the investors' confidence. The impact of volatility in the stock market is not the same (Liu et al., 1998), and it is transmitted from one sector to the other. Therefore, this study seeks to establish the relationship between the selected macroeconomic variables sectoral index volatility after introducing the moderating effect of investor sentiment.

**Methodology:** This review employed Systematic review research design to trace, gather and appraise relevant studies that address the relationship between the dependent and independent variables.

**Findings:** The outcomes of the study review the existence of a conceptual framework gap as empirical literature does not offer conclusive results on the sectoral index volatility and how it is influence by macroeconomic variables and investor sentiment. Previous studies were majorly conducted at a different time period in other markets presenting a geographical gap, and without factoring sectoral perspective.

**Unique contribution to theory, practice and policy**: The study will be beneficial to investors in portfolio formation for diversification purposes. The models developed from this study will aid the capital market authority and government to regulate listed firms in Kenya to develop policies that minimizes return volatility. The study will add new knowledge on sectoral index volatility to maximize market returns for listed firms in Kenya.

**Keywords:** *Macroeconomic Variables, Sectoral Index Volatility, Investor Sentiment*

## INTRODUCTION

In the last few years, investors have shown more interest in understanding the volatility of financial markets. They are more than ever anxious about the returns and risks on their investments. Investors' decision-making is influenced by the flow of communication, which is tightly associated with the stock index volatility. The unexpected changes in financial markets mean that investors may not make informed decisions on investments (Mamtha & Srinivasan, 2016). The concern of how predictable the expected returns are has become a significant issue on the ongoing debate amongst researchers and academia owing to its strategic importance for portfolio and personal investors.

Empirical evidence has shown that developing a capital market is essential for economic growth (Ashaolu & Ogunmuyiwa, 2010). Therefore, due to the critical position of the stock market in the global economy, the healthy development of the stock market has become the focus. Globally, and especially after the financial crisis of 2008, the stock market has experienced unprecedented fluctuations (Bhowmik & Wang, 2020). This volatility increases the uncertainty and risk of the stock market and is detrimental to the regular operation of the stock market. To reduce this uncertainty, it is essential to measure the volatility of stock index returns accurately.

Kenya being one of the emerging economies in Africa, its stock market performance is highly dependent on the nature of the macroeconomic variables. These variables are considered causes of stock return volatility existing in NSE and may lead to a stock market crisis (Odhiambo, 2012). According to the International Finance Corporation (IFC), all markets in developing countries are treated as emerging. Kenya's capital market, the Nairobi Securities Exchange Limited (NSE), is thus one of the world's emerging markets. Therefore, the knowledge of theoretical and literature significance of volatility is needed to measure the volatility of stock index returns (Bhowmik & Wang, 2020); hence Modern Portfolio Theory (MTP), Fisher's Hypothesis, and Arbitrage Pricing Theory (APT) were the pillars of this study. Ross (1976) classical model of APT will be the anchor theory as it links macroeconomic variables to stock market fluctuations. The modern portfolio theory backs this study in that the prices in the financial markets reflect events in the macroeconomic variables disparity. The influence of macroeconomic variables on financial market returns is then reflected through stock market volatility (Markowitz, 1952).

Kwon & Shin (1999) observed that the most prevalent macroeconomic variables are inflation, GDP, interest rates, foreign exchange rates, and market risk. The performance of organizations is affected by the country's economy. Asaolu and Ogunmuyiwa (2010) reported that macroeconomic variables are barometers for ensuring economic performance, including real Gross Domestic Product growth rate, rate of inflation, which is measured using CPI, the foreign exchange rate, fiscal status, and the debt level.

Globally, an economic survey (2021) reported that World real GDP contracted by 4.2 percent in 2020 compared to a growth of 2.7 percent in 2019, a worse performance than the 2008/2009 global financial crisis period. Emerging Market and Developing Economies (EMDEs) contracted by 2.2 percent in 2020 compared to a growth of 3.6 percent in 2019, while Sub-Saharan Africa economies contracted by 1.9 percent in the year under review compared to an expansion of 3.2 percent in 2019. East African

Community (EAC) real GDP contracted by 0.2 percent in 2020 compared to a growth of 6.2 percent recorded in 2019.

While Global inflation eased from 3.5 percent in 2019 to 3.2 percent in 2020, for the EMDEs, inflation remained the same in 2019 and 2020 to stand at 5.1 percent. In advanced economies, inflation slowed from 1.4 percent in 2019 to 0.8 percent in 2020. On the contrary, inflation in Sub-Saharan Africa increased to 10.8 percent in 2020, up from 8.5 percent in 2019. In EAC, Inflation rose from 4.0 percent in 2019 to 4.5 percent in 2020. Tanzania's real GDP is estimated to have grown by 1.0 percent in 2020 compared to 7.0 percent growth in 2019. Rwanda's economy contracted by 0.2 percent in 2020 compared to 9.4 percent growth in 2019, with her current account deficit as a percentage of GDP narrowing from 12.4 percent in 2019 to 12.2 percent in 2020. Uganda's economy is estimated to have contracted by 2.1 percent in 2020 compared to a growth of 6.7 percent in 2019.

Economic survey 2021 reported a downward adjustment of the Central Bank Rate (CBR), from 0.09 in July 2018 to 0.085 in November 2019 to 0.0825 in January 2020 to 0.07 in April 2020 and maintained it until the end of 2020. Additionally, annual inflation rates grew from 0.052 in December 2019 to 0.054 in 2020 (Economic survey, 2020). It is reported in the same Economic survey 2021 that real-world GDP contracted by 4.2 percent in 2020 compared to a growth of 2.7 percent in 2019, a performance that was worse than the 2008/2009 global financial crisis period. In Kenya, Real Gross Domestic Product (GDP) is similarly reported to have contracted by 0.3 percent in 2020 compared to a growth of 5.0 percent in 2019 and 6.3 in 2018 (Economic survey, 2021). The contraction was spread across all sectors of the economy but was more dismal in accommodation and food serving activities, education, professional and administrative service activities. However, agriculture, forestry, and Fishing activities were more vibrant in 2020 despite a contraction in global demand in 2020. The sector grew by 4.6 percent in 2020 compared to 2.3 percent growth in 2019. Manufacturing sector growth slowed down from 2.8 percent in 2019 to 0.2 percent in 2020 (Economic survey 2021)

**Investor Sentiments**

Investor sentiments, also known as market sentiments, refer to the general investor's attitudes towards a given stock in the financial market (Tripathi, Vipul & Dixit, 2020). Investor sentiments can also be regarded as the general feeling/tone of the investor as exposed through the price and activity movement of the stocks traded in the financial market. Ryu, 2019a; Stambaugh, Yu, and Yuan, 2012; Walther and Willis, 2013). Mian and Sankaraguruswamy (2012) find that stock returns react more strongly to good (evil) earnings news when investor sentiment is high (low). Chen and Lien (2017) argue that investor sentiment significantly affects the excess returns around macroeconomic information.

Investor sentiments are not at all times based on particular fundamentals. As a result, technical stock analysts and day traders tend to depend significantly on investor sentiments since they tend to influence stocks technical indicators that they use to estimate and profit from short-term price fluctuations caused by the attitude of investors security (Concetto & Ravazzolo, 2019). In addition, investor sentiment is significant since they tend to oppose stock investors who always like to trade in the opposite direction of the prevailing market consensus. For this reason, investor sentiments are considered a

crucial aspect of the capital market since they play a vital role in the constant fluctuations of the stock prices, thus creating uncertainty regarding future returns on investments (Concetto, & Ravazzolo, 2019).

Jin, Z., & Guo, K. (2021). Carried out a study comparing mature markets represented by the US stock market and emerging markets represented by the Chinese stock market at the sectoral level. The study established that the "barometer function" of the immature stock market is still weak and more accessible to be disabled by factors such as irrational market sentiment. Additionally, Traditional financial theories presume that investors are generally rational and that reasonable arbitrageurs may mitigate the pricing influence of irrational investors. As a result, behavioral finance theory began to supplant conventional finance theory, as it provides a complete explanation for these financial irregularities. Behavioral finance theory is grounded in cognitive psychology and assumes that investors are rationally limited in cognition, emotion, and attitude. As a result, investors respond incorrectly to market noise, resulting in systematic cognitive biases. Behavioral finance theory examines the impact of these irrational noisy traders on the functioning of efficient markets. One of the irrational elements that contribute to noise trading is investor emotion.

**Sectoral Index Volatility**

Volatility is considered the fluctuation of any stock price over a given period. This means that stock prices might be high during a particular time and low at other times (Oliveira, Cortez & Areal, 2017). As a result, the fluctuation in stock prices is usually measurable in different economic sectors. Many volatilities exist within a given stock market, such as implied and actual volatility. Actual volatility occurs when the volatility is computed based on accurate stock themselves. On the other hand, implied volatility is calculated based on underlying instruments. However, actual and implied volatility can be calculated for different periods such as past, present, and future, known as historical, current, and future volatility (Oliveira, Cortez & Areal, 2017).

Sectoral index volatility has been a critical source of concern in the financial sector worldwide for a long time. This is because sectoral index volatility substantially impacts the economy's stability and financial markets. According to Rupande, Muguto & Muzindutsi (2019), if volatility levels exceed a particular group, the chance of investor losses increases, raising concerns about the market's and the larger economy's stability. The stock return can directly indicate investors' perception of newly accessible information, whereas the volume traded can reflect investors' trust in the information (Rupande, Muguto & Muzindutsi, 2019).

Sub-dividing the stock market based on the industrial sector in which a firm operates is crucial. It allows firms with similar operations, regulations, and governance issues to be grouped (Shrimal, 2016). In addition, dividing companies based on their operational sector is crucial since such firms are likely to be affected similarly, especially when sector conditions, regulations, or even economic conditions change. In Kenya, sectoral index at NSE are grouped into thirteen key indexes, which are agriculture, insurance, automobile and accessories, banking, commercial and services, investment, investment services, energy and petroleum, construction and allied, real estate investment trust, exchange-traded fund, telecommunication and technology, and manufacturing and allied (Makau, 2021).

According to Nairobi Securities Exchange (2016) report, the introduction of interest rate caps would trigger high stock volatility in the financial market, which eventually get transmitted to other sectors. According to NSE (2021), NSE 20 SHARE INDEX fluctuated from 2,337.03 in February to 1,902.57 in December 2021, denoting an 18.59% drop. In the same report NSE, ALL SHARE INDEX increased from 148.60 in February 2020 to 166.46 in December, 202,1representingg a 10.73% increase.

## Nairobi Security Exchange

The Nairobi Security Exchange (NSE) is Kenya's primary stock listing market. Since it commenced trading back in 1954, NSE has been a renowned stock market throughout Africa and attracts a large number of both local and foreign investors (NSE, 2019). NSE is a member of the African Securities Exchange Association. Across the continent, NSE is credited as being the fourth largest stock market in terms of trading volumes and market capitalization. Many companies have been listed at NSE from every economic sector whose shares are doing quite well (Buigut & Soi, 2020).

Sixty-four companies on the NSE are classified into thirteen main categories. Agriculture, automobiles and accessories, banking, commercial and services, construction and allied, energy and petroleum, insurance, investment, investment services, manufacturing, and allied, telecommunications and technology, real estate investment trusts, and exchange-traded funds are some of the categories to consider (NSE, 2021). The firms take pride in various distinct variables that have a different impact on their financial performance. The firms in each of the thirteen categories have been in operation for varying lengths of time and with varying leverage levels, which means that the amount of experience varies. At the same time, the firms have been in business in their various industries for a variety of lengths of time and thus have a variety of perspectives on the dynamics of the industry

## Statement of the Problem

Stock index volatility has been a significant concern in the financial market worldwide, attributed to the fact that volatility in the stock market has substantial effects on the economy and financial markets (Omondi and Olweny, 2011). According to Hongyu and Zhichao (2006), if volatility levels behold a certain threshold, there is an increase in the risk of investor losses leading to rising concerns about the steadiness of the market and the broader economy. In the Kenyan securities market, a lot of volatility has been experienced, especially in the performance of initial public offerings (IPOs), such as Safaricom (2008), KenGen (2006), and Access Kenya (2007), leading to significant positive or negative returns after the issue. Such occurrences create a lot of desire for an investor to understand better the volatility in the stock market since beyond inevitable threshold volatility increases the risk of investor losses. According to Nairobi Securities Exchange (2016) report, the introduction of interest rate caps would trigger high stock volatility in the financial market, which eventually get transmitted to other sectors. According to NSE (2021), NSE 20 SHARE INDEX fluctuated from 2,337.03 in February to 1,902.57 in December 2021, denoting an 18.59% drop. In the same report NSE, ALL SHARE INDEX increased from 148.60 in February 2020 to 166.46 in December 2021, representing a 10.73% increase.

Stock volatility has been observed in various studies undertaken in the past. Multiple studies have previously been done to assess the impact of macroeconomic factors on the stock return volatility on the NSE. Ouma and Muriu (2014) established that exchange rate, inflation, and money supply have a significant effect on the stock market in Kenya. Mwai (2013) concluded that interest rates, GDP, inflation, and exchange rate significantly impact share prices. Mbaabu (2018) established that interest rates, inflation rate, the balance of payment, and government expenditure positively correlate with stock market volatility, while economic growth negatively correlates. Finally, Ngunjiri (2018) concluded that money supply and interest rate have no substantial effect on the stock market returns.

Several international and local studies have been undertaken on investors' sentiments and sectoral index volatility. Khan and Ahmad (2019) conducted a study in Pakistan that examined the bi-directional coexistent and lead-lag relations between investor sentiment and market returns in the emerging market of Pakistan and found evidence of irrational investors' behavior and market return. Rupande, Muguto, and Muzindutsi (2019) studied South Africa that examined investor sentiment and stock return volatility at Johannesburg Stock Exchange.

However, these studies have not addressed sectoral perspective when analyzing the relationship between macroeconomic variables, investors sentiment, and stock volatility. For this reason, it is crucial to provide stock investors with critical insight regarding macroeconomic variables, investor sentiments, and volatility (Makau, 2021). This is because risk management, portfolio management, policymaking, and price discovery critically depend on market players' capacity to quantify risk. Failure to do so results in ineffective risk management, inefficient portfolio strategies, continuous mispricing, and inadequate price discovery (Lwanga, 2018). Therefore, the current research aims to bridge this gap by reviewing the relationship between the macroeconomic variables, sectoral index volatility and investors' sentiment on of firms listed at NSE.

## LITERATURE REVIEW

### Theoretical Review

According to Abend (2008), the theoretical review section summaries theories that are pertinent to the subject matter of the study and which resonate with broader aspects of the areas of knowledge under consideration. This study reviewed Modern Portfolio Theory and the arbitrage pricing model.

### Fisher's Hypothesis

Fisher developed the fishers' hypothesis in 1930. According to Fisher (1930), stocks can be used as a shield against the Inflation rate since they present claims against tangible business assets. When the projected Inflation rate is noticeable, investors dispose of their financial assets and substitute them for real assets. The association between the Inflation rate and stock prices has been positive ever since nominal stock prices mirror expected inflation (Grande, Locarno, & Massa, 2017).

The inadequacy of fisher's hypothesis is that empirically, research shows that the connection between the Inflation rate and stock markets is not always positive and, at times, negative. The inflation rate has the consequence of growing operating costs for

businesses. This, in return lessens corporate profitability and dividends, instigating a drop in stock prices. Consequently, this shrinks the performance of equity markets (Oprea, 2014).

According to (Uwubanmwen and Eghosa, 2015), throughout high inflation periods, individuals shift their expenditure from investments to consumption. This would trigger a reduction in demand for securities in the market, demonstrated by reduced trading volumes and values, beginning a weakening in equity prices (Ozurumba, 2012). Other studies have also shown that the Inflation rate does not affect stock market performance (Hau, 2017). Given this prediction of fisher's hypothesis that the Inflation rate has a positive effect on stock prices, the theory is significant in constructing the study hypothesis that the Inflation rate measured by consumer price index does not granger causes sectoral index volatility of firms listed in the Nairobi Security Exchange.

### Modern Portfolio Theory (MPT)

Modern Portfolio Theory was proposed by Markowitz (1952). The theory suggests that risk and return are directly linked. This indicates that stock investors must assume higher-level risk to attain higher potential returns. Stock diversification is the critical component of Modern Portfolio Theory.  According to statistical measures like variance and correlation, the success of a single investment is less critical than how it influences the total portfolio. The MPT presupposes that investors are risk-averse, choosing a less risky portfolio over a riskier one for a given rate of return (Rutterford & Sotiropoulos, 2016). In practice, risk aversion mandates that most investors diversify their holdings across asset classes. Therefore, MTP will be significant in this study since it will explain how investing in more than one stock will minimize investors' risk due to sectoral index volatility irrespective of the current market sentiments.

### Arbitrage Pricing Theory (APT)

Arbitrage Pricing Theory (ATP) was proposed by Ross (1976). According to the theory, the expected return on a financial asset can be described as a linear model of several variables or a theoretical market index. The theory explains that volatility in stock prices is attributed to several variables capable of influencing return volatility. Arbitrage in the APT context refers to trading two assets that are mispriced at least. The arbitrageur sells the significantly overpriced asset and uses the money to acquire a very underpriced one (French, 2017). According to the APT, an underlying asset is mispriced if its current price deviates from the model's expected price. Today's asset price should equal the total of all future cash flows discounted at the APT rate. The asset's expected return is a linear function of several factors, and a factor-specific beta coefficient represents the susceptibility of each element to change. Therefore, the theory is of great significance to the current study. It elaborates how trading in two assets can minimize investor exposure to the risk caused by stock price volatility.

### Inflation and sectoral index volatility

Shrestha and Subedi (2014) sought to establish the relationship between macroeconomic variables and the stock market performance in Nepal. The study was based on secondary data and used the time series data for 24 years from the fiscal year 1994 to 2018. The

study used the Ordinary Least squares estimation method to examine the relationship between the two variables. The study found that the stock market's performance in Nepal positively responded to changes in Inflation. The study documents that investors in stock seem to take equity as a hedge against inflation, considering stock as an alternative financial instrument. The use of OLS in establishing the relationship between macroeconomic variables and stock performance has a weakness in that it does not allow the researcher to capture the effect of past stock performance on present stock performance. Additionally, the study assumed that OLS assumptions hold, which might not be the case. The current study will test if the assumptions of OLS hold and, after that, use a superior model to analyze the interactions.

Barakat et al. (2016) investigate the relationship between macroeconomic factors and the stock exchange in Egypt and Tunisia from January 1998 to January 2014. The study established a causal association among the market index and interest rate, consumer price index (CPI), Gross domestic products, exchange rate, and money supply. The same results go for Tunisia except for CPI. The results reveal that the interest rate, inflation rate, and exchange rate simultaneously significantly influence sectoral indices in Indonesia. The interest rate partially negatively affects all sectors except primary industry chemical, finance, infrastructure, utilities, transportation, and various industry sectors. The inflation rate partly has no significant effect on all industries. On the other hand, the exchange rate partially shows a significant negative impact on all sectors. The current study will examine the interaction between the selected macroeconomic variable and sectoral index volatility in Kenya. Additionally, the regression model is a wicker model; therefore, the current study will employ a superior model VAR model or VEC model to analyze the relationships. To sum it up, the present study will introduce a moderating variable to strengthen the relationship between the independent and dependent variables.

### Interest rates and sectoral index volatility

Ganavi K K (2018) investigated the disparity of share price on three prominent macroeconomic variables GDP, Inflation rate, and Interest rate in NSE, India. The study used monthly data covering April 2013 to March 2018 (Financial Year) of nifty 50 companies. The study adopted a regression model, a descriptive survey method, and research data gathered was analyzed using statistical software package for social sciences (SPSS version 22) and Microsoft excel. The study posits that the share price volatility of NSE depends on GDP, inflation rate, and interest rate. The three prominent independents (economic) variables studied elucidate share price volatility characterized by R2 govern nearly 97.9%. The current study will examine the interaction between the selected macroeconomic variable and sectoral index volatility in Kenya. Additionally, the regression model is a wicker model; therefore, the current study will employ a superior model VAR model or VEC model to analyze the relationships. To sum it up, the present study will introduce a moderating variable to strengthen the relationship between the independent and dependent variables.

Mungiria and Njuguna (2021) studied the relationship between the selected macroeconomic variables and the financial performance of investment banks in Kenya. *A causal research design* was adopted and targeted 16 investment banks Licensed by CMA and have been active from July 2006 to December 2019. A population census was employed to collect secondary data on the investment banks, and employed VEC Model

and VAR Model. The study found that inflation has *significant negative* influence, GDP has *positive and significant* impact, the Interest rate was also found to have a *negative and significant* influence on the financial performance of investment banks in Kenya. The current study will focus on the interaction between macroeconomic variables and sectoral index volatility.

## Real GDP and sectoral index volatility

Amata, E.O. (2017) studied the Effect of Macroeconomic Variables on Stock Market Volatility in Kenya. The study further explored the moderating effect of investor herding behavior on the direct relationship between selected macroeconomic variables and stock market volatility. This study adopted the standard deviation of the NASI index as the proxy for Stock market volatility (Dependent variable). The study established that herding behavior moderates the relationship between exchange rate and stock market volatility, and that herding behavior has no moderating effect in the relationship between interest rate, inflation, and GDP and stock market volatility. The study observes that there is a significant short-run and long-run relationship between inflation and stock market volatility and a significant but weak short-run and long-run relationship between interest rate and stock market volatility. On the other hand, the study concludes that there is no significant short-run and long-run relationship between exchange rate, GDP, and stock market volatility which contradicts other researchers finding such as Ambunya (2012). The current study will adopt sectoral volatility as well as introduce a moderating variable to provide interaction between macroeconomic variables and sectoral volatility. Additionally, the current study will introduce the impulse response function and forecast error variance decomposition to access the both long-run and short-run relationship and the speed of adjustment.

Olorunleke (2014) studied the Analysis of Output Growth, Inflation, and Interest Rates on Stock Market Return in Nigeria using time series data for the period from 1986 to 2012. The study used Ordinary least squares(OLS), cointegration test, and Granger causality methods to establish the relationships. the study findings suggest that NSE-All share index, inflation rate, interest rate, and real GDP move together in the long run. The study also shows that there is a granger causality between stock market returns in Nigeria and GDP. However, the study assumed that OLS assumptions hold therefore never tested for violations. Additionally, they did not conduct an Impulse response function (IRF) or the Forecast Error Vector Decomposition (FEVD) which are necessary for prediction and determining the speed of readjustments to the equilibrium.

## Macroeconomic variables, Investor sentiment, and sectoral index volatility

Khan and Ahmad (2019) conducted a study in Pakistan that examined the bi-directional coexistent and lead-lag relations between investor sentiment and market returns in the emerging market of Pakistan. The study uses a direct proxy, the Google search volume index (GSVI), and nine indirect proxies to gauge investor sentiment. In addition to traditional regression and VAR models, the study uses Geweke's (1982) tests to analyze the nature of sentiment-return correlations. As a result, the study adds to the current literature by giving the most up-to-date and comprehensive statistical evidence on the influence of investor emotion in market outcomes. The study reveals significant irrational investor behavior in Pakistan's thin market. The findings show that sentiment plays a vital

role in pulling the stock market away from its long-term course, as predicted by economic fundamentals. The study examined bi-directional coexistent and lead-lag relations between investor sentiment and market returns in the emerging market of Pakistan. In contrast, the current study will examine the effect of investor sentiments on sectoral index volatility among firms listed at NSE in Kenya.

Rupande, Muguto, and Muzindutsi (2019) studied South Africa that examined investor sentiment and stock return volatility at Johannesburg Stock Exchange. This assumption is tested on the South African market using a daily sentiment composite index constructed from a collection of proxies and Generalized Autoregressive Conditional Heteroscedasticity models from July 2002 to June 2018. The findings reveal a strong link between investor emotion and stock return volatility, indicating that behavioral finance can effectively explain the behavior of stock returns on the Johannesburg Stock Exchange. As a result of the shortcomings of popular asset pricing models such as the Capital Asset Pricing Model, it is advised that consideration be given to supplementing these asset pricing models with a sentiment risk element. The study was done among firms listed at Johannesburg Stock Exchange in South Africa, while the current research will be done among firms listed at NSE in Kenya.

Salhin, Sherif, and Jones (2016) conducted a study in the UK that evaluated managerial sentiment, consumer confidence, and sector returns. The study used monthly data from the UK between January 1985 to December 2014. In addition, a sample of consumer and business confidence indicators was provided by the European Commission. The study shed new light on the relationship between managerial and consumer sentiment index and stock performance. The study discovered little evidence that consumer confidence is a reliable predictor of stock returns. Notably, executive sentiment significantly impacts the aggregate market and sector return index. Additionally, the study discovered that parameter estimates for sector groupings do not agree, showing that the sentiment-return link varies by sector. The study looked at the managerial sentiment, consumer confidence, and how they influence sector returns in the UK. In contrast, the current study will use investor sentiments to examine how they affect sectoral index volatility among firms listed at NSE in Kenya.

Simiyu, E., Korir, J., & Laiboni, G. (2020) carried out an empirical investigation into the dynamic linkages of the Nairobi Securities Exchange's sectors. The study Used a weekly index from June 2008 to February 2019 and adopted VECM, impulse response function, and forecast error variance decomposition to estimate the temporal relationship. Also, the Granger causality cointegration test was incorporated into the study. The results from Cointegration testing reveal the presence of one cointegrating relation, ostensibly between the investment and banking sectors. Granger causality analysis, which was based on the output of a VECM, shows the presence of bidirectional Granger causality between the Manufacturing and Allied & Banking sectors as well as the Banking & Investment sectors. However, there is no Granger causality between the Investment and Manufacturing and Allied sectors. Results of impulse response analysis and forecast variance error decomposition show that sectoral volatility, and hence returns, of each sector, are influenced by both own and cross shocks. This study focused on own and cross shocks to investigate sectoral return and hence volatility. However, the current study will assess sectoral volatility from a macroeconomic fluctuations point of view. On the other

hand, the current study intends to introduce investor sentiment as moderating variable to broaden the linkages.
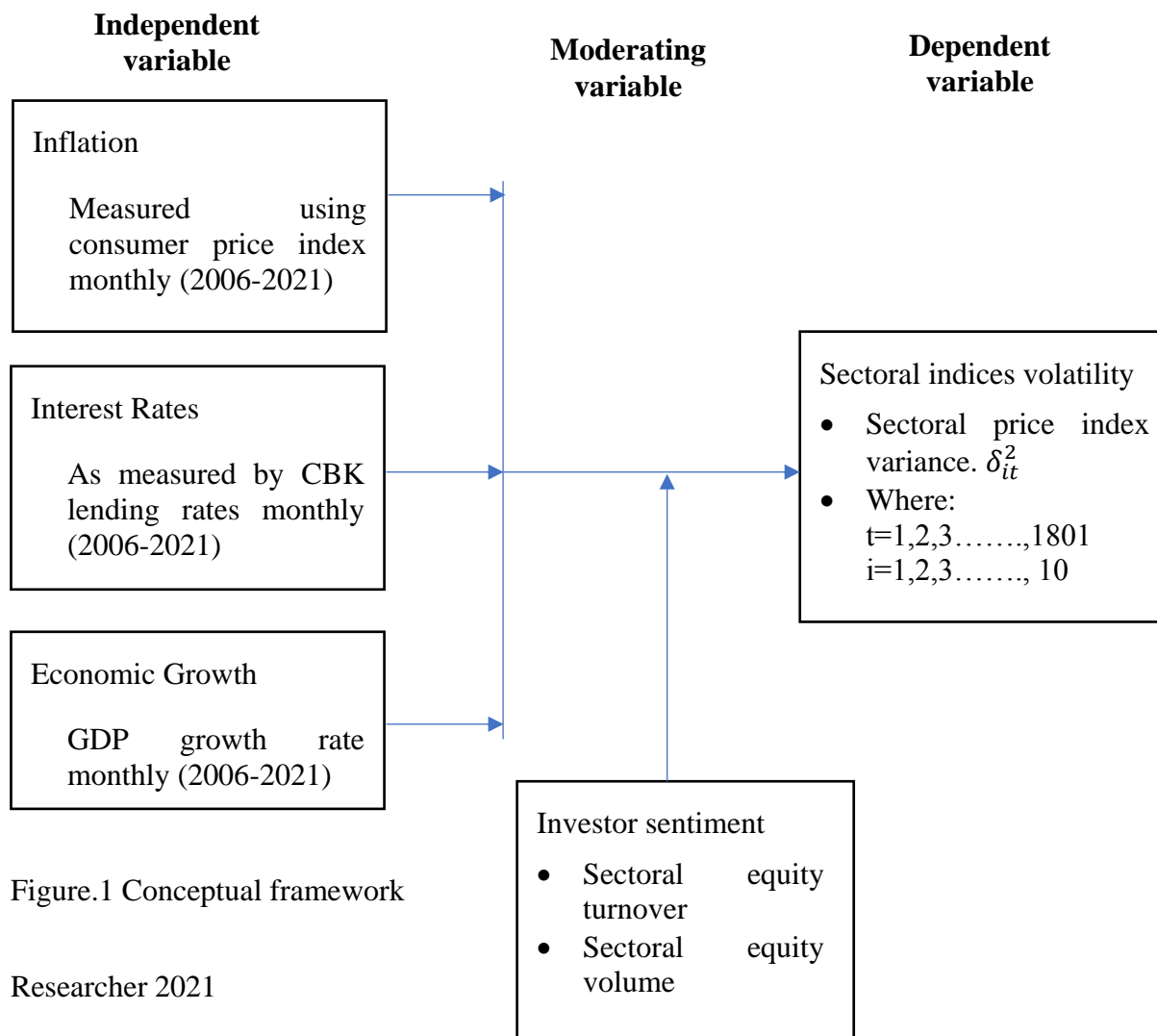
**Conceptual framework**



Figure.1 Conceptual framework

Researcher 2021

## METHODOLOGY

This review employed a Systematic review research design to trace, gather and appraise relevant studies that address the relationship between the sectoral index volatility (dependent) and macroeconomic variables and investor sentiment (independent variables).

## RESULTS

### Conceptual gap

There are enormous contradictions in observations exhibited from the reviewed literature about the effect of inflation, interest rate, exchange rate, and gross domestic product on stock market volatility. Barakat et al. (2016) observed that The inflation rate partly has no

significant effect on all industries while Shrestha and Subedi (2014) observed that the stock market's performance in Nepal positively and significantly responded to changes in Inflation

Empirical literature reviewed above supports the fact that many studies done to investigate the relationship between macroeconomic variables and stock market volatility in Kenya have exhibited varied conclusions. The variations in findings entice a necessity for additional investigation to narrow the findings. Additionally, from the reviewed literature, all share index was majorly employed as a proxy for shock market volatility denying the investors a sectoral overview of market volatility. Notably, only one of the reviewed literature introduced moderating variable (herding) as a linkage between macroeconomic variables and stock market volatility. However, the interaction was only exhibited by one variable implying moderating variable adopted provided weak interactions.

Salhin, Sherif, and Jones (2016), Rupande, Muguto, and Muzindutsi (2019) Padungsaksawasdi (2019), Khan, Hernandez, & Shahzad (2020), Khan and Ahmad (2019), Olorunleke (2014), Amata, E.O. (2017) were done in other markets and in Kenya

To crown it all, the literature reviewed methodological shortcomings, due to assumptions that OLS assumptions hold without testing which is a violation in research implying the findings may not be reliable nor justifiable. The current study would embark on addressing these gaps by introducing investor sentiment as a moderating variable, establishing the interactions between macroeconomic variables and sectoral index volatility.

## CONCLUSION AND RECOMMENDATION

The study will be beneficial to investors in portfolio formation for diversification purposes. The models developed from this study will aid the capital market authority and government to regulate listed firms in Kenya to develop policies that minimize return volatility. The study will add new knowledge on sectoral index volatility to maximize market returns for listed firms in Kenya. The study recommends more research on sectoral index volatility to provide investors with a wide range of diversification options

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