EFFECTS OF SELECTED MACROECONOMIC VARIABLES ON THE EQUITY MARKET PERFORMANCE OF NAIROBI SECURITIES EXCHANGE

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DECLARATION

This research project is my original work and to the best of my knowledge, has not been presented for the award of a degree in any University.
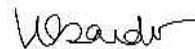
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This research project has been submitted for examination with my approval as University Supervisor.

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DEDICATION

This superb piece of work could have not been possible without material and moral support of wol

John Akech and Awien who made sure the education for the whole family is their priority.

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LIST OF ABBREVIATIONS

APT   Arbitrage Pricing Theory

CAPM   Capital Asset Pricing Model

CBK   Centre Bank of Kenya

EMH   Efficient Market Hypothesis

GNP   Gross National Product

GDP   Gross Domestic Product

NASI   Nairobi Securities Exchange All Share Index

NSE   Nairobi Securities Exchange

ABSTRACT

The research looked into the impacts of the selected macroeconomic variables on the performance of equity market of NSE. Nonetheless, the study also assessed if changes in the variables picked for this research could be applied in forecasting the overall future wellbeing of the Share Index of NSE. Qualitative data for periods ranging from Jan 2010 to Dec 2019 was gathered from public institutions and websites and was analyzed using STATA 15 given it is time series data. The study identified both interest rate and exchange rate had negative impact but significantly related to equity market performance. However Inflation rate was found to have positive and substantial effect on performance of the equity market. Further, Gross Domestic Product variable was on the contrary found to negatively and insignificantly affect equity market performance. The F statistic was also significant justifying the fitness of the model in explaining the performance of the share prices. The study suggests CBK keeps an eye on inflation rates and exchange rates, reason being, high inflation rates hike prices of commodities making life difficult for the citizens , whereas high interest rates scare away borrowers who could have taken up loans from financial institutions and invest in various economic activities, hence good for the economy. Nevertheless there is also an evidence showing lower rates improve performance of equity market.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Equity market stimulates development by pooling significant and long-term capital as a result of issuing shares, stocks and other securities for businesses in desperate necessity of funding to increase operations. Hence, general growth of economy deals with how best equity market functions and practical facts have demonstrated that expansion of the securities exchange market is necessary for economic development. Ting et al. (2012) reviewed the lasting results of selected macroeconomic indicators on Malaysian stock exchange. The study uncovered

, interest rate, exchange rate and industrial production as the culprits which caused fluctuation to equity market.

Ross (1976) used statistical instruments such as variables analysis in the Arbitrage Pricing Theory (APT) and thus applied macroeconomic forces minus necessity of initial measurement of factors which determines equity yields unfortunately critiques emerged sooner. One of the arguments was stated APT could not show the underlying factors rather than driving them statically. Chen, Roll and Ross (1986) initiated practice of selected economic indicators as a substitution for unspecified factors in the APT and the three scholars struggled to explain equity yields as an aspect of economic indicators. Meanwhile indicators such as interest rates, Treasury bill rates can affect projected dividends and the discount rate, it was resolved that equity prices as well as equity yields are systematically influenced by economic factors.

No skepticism about the correlation among macroeconomic forces and equity market performance, equity given values are normally supposed to be affected by nearly essential macroeconomic factors like interest rate, inflation, real GDP, exchange rate etc.

1.1.1 Macroeconomic Variables

Maghyereh (2002) refers to macroeconomic variables as any aspect that is relevant to wider economy at regional or countrywide rank and influence vast population instead of limited selected entities. Example of these variables comprise of interest rate, unemployment, inflation, GDP, savings and investment etc. KNBS produce data of several economic growth factors such as inflation, informal sector employment, GDP growth rate etc. (Ariemba, Riro & Kiweu, 2015).

Tucker (2007) define inflation as an upsurge in total prices of commodities and amenities in an economy. Sloman and Kevin (2007) describe inflation can either occur as demand pull inflation or cost push inflation. Exchange rate is the rate for exchanging currencies of one nation state for money of another nation. Fluctuation of exchange rate is regularly center on varies in credit market positions, reviewed as a result of variations in lending rate disparities across the nations, and variations in the regulatory strategies of central banks. Profit-maximizing stockholders in wellregulated stock market will make certain all pertinent data presently studied fluctuations in macroeconomic factors are completely revealed in existing equity prices, hence shareholders will not be capable to net abnormal profit over the forecast of prospect equity inequalities across nations, and variations in the market fluctuations (Chong and Koh, 2003). The levels of Gross

Domestic Product (GDP) will likely affect equity returns due to effect on corporate profitability. Expansion in productivity may lead to growth of projected impending cash in addition raise equity prices while the contrary impact would be effective in a recession (Chen and Sharma, 2002). Real

Gross Domestic Product is aggregate manufacture of commodities and amenities produced in a given economy adjusted for price fluctuations. Real GDP is graded as an average annual GDP growth rate.

The key proof that selected macroeconomic variables aid the forecast of time series of equity yields has been gathered for over four decades. The inferences illustrated from EMH such as early researches by Fama and Schwert (1977) and Nelson (1977) among others all upholding that selected macroeconomic variables affect equity yields. Inflation, GDP, interest rate and exchange rate are closely observed by businesses, government and consumers and by extension private equity corporations since they have an effect on their financial performance which justify my selection of few main macroeconomic variables.

1.1.2 Equity Market Performance

Equity market is a market where shares in public owned firms are traded. Shares are unit of ownership in the company. Shares entitle the stockholders to dividends when the company makes return from operations. When the company makes losses, the similar is shared between stockholders as well in reference to the securities owned, often dictated as profit/loss per share. (Osorio, 2013).

A company's equity market performance disseminates information to the market on its continued performance. Investors would ideally base their investment decisions on a firm's capability to sustain its performance in the long-run. It is thus incumbent on investors and/or their advisors to understand the dynamics at play before committing to a position on stock. Fundamental analysis is typically used to gauge the key drivers of a share prices. Whereas for shorter- term investors, technical analysis can be used and relies on models based around price and volume transformations

and Chartism to forecast the fluctuation of share prices. Eugene Fama via the Efficient Market Hypothesis (EMH) developed in the 1960s, disputed both these forms of analysis. He argued that the valuation of a selected stock is assumed to be accurate based on the information available.

The general equity market performance can be affected by a number of factors: some of these would be at a micro-level and may be company or industry specific; whilst other factors would impact the economy as a whole. Typically, indices are used to get the trajectory of performance of the market. Indices are normally made up of selected listed stocks, bonds, etc. Indices are sampled to be surrogate representative of the separate segments and overall adjustment in price in line. Dubravka and Petra (2010) found tracking the market index offered up the major statistical significant explanation of equity yields. One of the key considerations in setting up and evaluating an index is that it should convey information to a large number of investors about the general performance of stocks factored in. Events unique to one or two stocks should not exert unduly large effect on the overall index. Each stock relative importance (weighting) in representative portfolios changes as the price of individual stocks change over time (Thomas, 2006).

1.1.3 Macroeconomic Variables and Equity Market Performance

In recent years, the link between macroeconomic forces and equity market has remained a great deal for financial economists and specialist. Perhaps it is usually said equity rates are ascertained by some basic macroeconomic indicators which includes interest rate, Gross Domestic Product (GDP), inflation etc. Historical prove from view point of financial reports imply that investors believe the monetarist strategy and macroeconomic phenomenon have a huge effect on fluctuation of equity prices. That means macroeconomic factors could pressurize tremors on security yields and impact investors savings choice. This drives several academics to examine
Interaction of securities yield and macroeconomic indicators (Christopher et al., 2006).

Macroeconomic factors have outstanding influence on equity price fluctuation in addition to earnings nevertheless the center of causal correlation among macroeconomic factors and equity earning is not acknowledged by foregone conclusion as shown in Flannery and Protopapadakis (2002) study. Market efficiency theory features the fluctuation of equity earnings to new information that influence the estimated discount rates or prospect profits. A well-regulated market, for instance, integrates all present market information in equity prices. To some extent new information is taken to reveal all accessible information. Researches by Fama and Schwert (1977), and Jaffe and Mandelkar (1976) explain that different information on macroeconomic forces have pressure on equity earnings. This attest optimism that macroeconomic factors affect equity earnings and hence recommends that equity markets are inefficient. Practical proof proposes that equity yields react to financial update however there is no model on interaction of equity earnings with macroeconomic indicators in single trend, although equity prices remain well-known to respond to market powers. Ambiguity continued about interactions among macroeconomic indicators and equity market performance for the reason that different economic situations of countries, varying information set and various analysis approaches used to conclude these connections.

The theory linking macroeconomic indicators and equity performance is Arbitrage Pricing Theory (APT) created by Ross in 1976 where numerous risk variables be able to describe equity earnings. However initial practical studies on APT center on single stock yields, it can similarly be used in accumulated equity market structure, where adjustment in a particular macroeconomic indicator might be understood as a reproducing variation in primary general risk element manipulating prospect earnings. Record of observed researches on APT model, relating the position of macroeconomy to securities exchange performance, are categorized by demonstrating a short-run

correlation amongst macroeconomic factors and equity price in relations to first difference, supposing trend stationary.

Another theory is discounted cash flow model or present value model (PVM). The theory narrates the equity earnings of the anticipated cash streams and discount rates of very cash flow. On one occasion, whole macroeconomic variables that impact prospective expected cash flow or the discount ratio through which these cash streams are discounted ought to have an effect on equity yields. Benefit of PVM ideal is to emphasize on long run correlation amongst the equity market and macroeconomic factors. Campbell and Shiller (1988) investigated the link between equity values, yields and anticipated dividends. Campbell and Shiller found that the durable moving average of returns approximation estimate dividends and ratio of this yield factors to present equity value was influential in forecasting equity earnings over numerous ages.

1.1.4 Nairobi Securities Exchange

Due to the need to have an organization which could act as securities broker as listed in societies act led to the creation of Nairobi Securities Exchange in 1954. NSE deal in stocks and securities happened in Kenya in 1920s. Shares broking was done merely by colonials and merchants who happened to interchange charges over a mug of coffee. Exchange was carried out over what was referred to as gentlemen's agreement in which standardized fees were charged and conditioning customers to respect their pledged obligations namely conveyance and paying associated cost, there was no official marketplace or guidelines to manage share broking.

Three key performance indices are namely the NSE all-share index, the 25 share index and NSE 20 share index. The study used the NSE All share index to quantify NSE performance. Nairobi Securities Exchange has performed vital role in rallying capitals and introducing enabling Mechanisms to companies in generating funds

. The NSE promoted the inflow of foreign capital from 1995 which convinced the state to permit people invest in the locally owned companies regardless of where they come from.

The Nairobi Securities Exchange (NSE) as at 2019 has a total listed of 64 firms and classified the listed companies into 14 sectors to align them with various sectors of the economy.

1.2 Research Problem

Various macroeconomic forces including fluctuation in currency exchange, interest rate, inflation rate, unemployment and financial development are held to influence equity market performance. Macroeconomic method challenges to investigate sensitivity of equity prices to variations in macroeconomic factors. In this macroeconomic method, equity values are affected by fluctuation in lending rate, inflation rate etc. The aforementioned practices an overall symmetry method, highlighting the correlation among segments as significant to insight of determining sequential movement of macroeconomic variables centered on economic rationality, which recommends that everything is determined by something different (Emenuga, 1994).

Equity market operates as the most significant market for funds and efficient securities market is necessary to stimulate economic growth. Kenyan economy has undergone diverse macroeconomic occurrence over the years. Similarly, Nairobi Securities Exchange has also experienced a sequences of reorganizations to equate its level with other developing securities exchange markets on the globe in order to attract external investors The objective is to back up fundamental sectors of the economy and to open up market so as to raise funds besides making it attractive to both indigenous and external investors. Kenyan regime has been proposing several incentives to enhance the equity market especially the foreign stockholders are given considerable inducements to invest in Kenyan securities. The government through the Capital Market Authority has seized a

number of phases to expand Kenyan Equity Market. Additionally, securities exchange market produces a significant fragment in economy and firms listed in NSE are at present participating in the growth of infrastructure e.g. the Real Estate, Telecom, Water and Health sectors.

Global studies including the study conducted by Maku & Atanda, (2010) observed the performance of Equity market in Nigeria was influenced by macroeconomic indicators as time went on. Ting et al. (2012) recognized that Kuala Lumpur Multiple Index is regularly affected by interest rate, consumer price index and money supply and be it in the short-term or long-run in Malaysia. Mehwish (2013) identified the existence of a negative relationship between stock exchange and performance of interest rate in Pakistan. However, most of these findings focus on few macroeconomic variables and perhaps there is gap in literature as far as studies in Kenya is concerned.

Most studies in Kenya have been done in regard to equity market performance at NSE. (Ndunda, 2016) investigate the results of macroeconomic forces on performance of equity markets at NSE. Study concluded there is a positive interaction among the nominated macroeconomic indicators

(Inflation rate, Currency Exchange, money supply, and GDP) and stock exchange performance. The research however did not include all macroeconomic variables and hence the conclusions made from the study was incomplete. (Masila, 2010) did a research to institute the origins of the development of equity market at NSE. Her study only looked into macroeconomic stability in general without taking a real dive into studying multiple economic indicators. The findings of the earlier researches have besides improved according to macroeconomic variables used, the study approach engaged and nations investigated. Since researches prepared in Kenya have not engaged each macroeconomic factor.

1.3 Research objective

To assess the effects of selected macroeconomic variables on the performance of equity market of NSE.

1.4 Value of the Study

This material is an asset for corporations registered with Nairobi Securities Exchange. Board of directors and managers of these corporations will have an empirical basis upon which they can base their strategies to improve their equity performance.

The study will also be valuable to investors as it will show the influence of macroeconomic forces on equity performance thus make it possible to ascertain the appropriate time to buy or sell securities. The scholarly community in the field of economics and finance will find this material a valuable tool should they wish to conduct further researches in the same field.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

. The part addresses the in depth review of the relationship between the theories picked for this and equity market performance. It also takes into account empirical review of the materials available on the research in question, in other words, the research intents to revisit previous researches in the same field. And lastly, it also covers the determinants of equity market performance, conceptual frame work and summary.

2.2 Theoretical Review

Here are four schools of thought supporting this research. These are Market Efficiency Theory, Arbitrage Pricing Theory (APT), Behavioral Finance Theory and Capital Asset Pricing Model.

2.2.1 Market Efficiency Theory

Market efficient hypothesis proposes that market is rational and presents accurate valuation. In other words, present values of shares are adjacent to their fundamental rates since any of rational stockholders or the arbitragers buy and sell actions of undervalued or overvalued equity. Contrarily, observed market irregularities have disputed this argument, Fama (1970) introduce a milestone study on the efficient market hypothesis, which concentrated on general analysis of model and further than the theory to empirical work. Fama explains that all available data is echoed in equity prices. Market Efficiency Theory has three notable steps which include weak form, semistrong form, and strong form. Weak form of efficiency asserts that present stock prices echo all past data including historical prices and transaction capacities (Bodie et al, 2007).

Semi strong form of efficiency entails past market data and widely accessible data such as important information on company's product line, yields projection, dividends, stock splits publications, excellent management, statement of financial position structure, and copyrights own, accounting systems etc. ought to be completely revealed in share values. Hence, investors cannot create return by means of fundamental analysis in market.

Strong form of efficiency affirms security prices reveal altogether facts including the historical information and all widely accessible data plus entirely inside information. Hence, shares prices would continuously be unbiased and any stockholder or brokers cannot beat the market. This concept is applicable to this research because it intends to evaluate influence of macroeconomic forces on the wellbeing of equity market of NSE.

2.2.2 Arbitrage Pricing Theory

This classical hypothesis explains that security return can be projected with direct correlation of security anticipated earnings and macroeconomic indicators that influence security risk. Financial economist Stephen Ross came up with this theory in 1976. Arbitrage pricing model gives forecasters and shareholders a multi-factor pricing theory for shares centered on link among financial securities anticipated yield and its risks.

Arbitrage pricing model identifies the rational market value of share that may perhaps be provisionally mispriced. This concept undertakes financial market activities as less than continually perfectly well-organized, hence rarely marks in securities being mispriced – either overpriced or underpriced – for short time. On the other hand, stock exchange activities would ultimately correct the condition, moving prices back to its reasonable market prices. Arbitrageur take advantage of briefly mispriced shares means short-range prospect to profit virtually risk-free.

This model provides stockholders and specialists with chance to modify their study.

2.2.3 Behavioral Finance Theory

The theory refers to the effect of mindset on behavior of financial specialist and consequent impact on general Stock Exchange performance. Behavioral finance seeks to elaborate and raise the intellectual levels of stockholders such as emotional manners included and level that they affect investors' choices. It addresses questions such as why, how and what which could arise from the view point of a rationale investor with intention to invest in particular investment. Conventional hypothesis of investment had the essential model that diversification allotment is centered on the anticipated revenues and unforeseeable danger; Risk is grounded in CAPM plus many other additional structures (Fama and Fisher, 1996).

Behavioral finance clarify market may perhaps crash to reproduce economic essentials under three circumstances. When they all apply, model forecasts that appraising prejudices in stock markets can all be in creditable and steady. The first behavioral state is irrational behavior. It describes that shareholders act irrationally once they do not properly process all accessible facts although developing their opportunities of firm's prospect. The second is an organized outlines of behavior, which elaborates if individual stockholders decides to buy or sell shares minus referring to economic first principles, the influence on security values would remain regulate. Finally, restrictions to arbitrage in stock exchange conclude that while stockholders accept that the firm latest durable performance single-handedly is a signal of impending performance; they may begin to buy more stocks and increase the prices. Some shareholders may anticipate the firm which catches the market off guard in just one quarter to go beyond expected (Fama, 1965).

2.2.4 Capital Asset Pricing Model (CAPM)

Valuing equities has been a myriad trepidation in studies related to finance and economics. The

popularly known model referred to as CAPM was engineered by Sharpe (1964), Linter (1965)

and Mossin (1966) but on the basis of Markowitz' (1952) mean variance portfolio model. CAPM

uses single variable known as market index to analyze stock yield, it

Presumes that because of the uncertainties investors hedge against the risk, securities exchange is

impeccable and investors can lend and borrow unrestricted sums at risk-free rate etc. Every

assumption is subjected to strong evaluations which instigated progresses in the theory by

presenting new forms of CAPM. A significant critique was concerning the exceptional function

plays by the market in the theory due to additional factors multifactor models established.

King (1966) and Merton (1973) founded the research papers on multifactor models. While their

researches presented an input to asset pricing models, market index was still foremost pricing

factor in their theory alongside additional factors utilized. (Ross, 1976) lastly got the relationship

linking macroeconomic factors and equity yields as a result of APT model.

2.3 Determinants of Equity Market Performance

There are growing countless researches to ascertain the equity market performance in Nairobi

Securities Exchange. Several determinants are as follows:

2.3.1 Macroeconomic Variables

Higher lending charges slash the present value of future dividend income, which have to decrease

equity values. On investors' viewpoint, high return fixed income savings would incline to stay

desirable and moderately secure to stockholders than stocks. Higher inflation degree on the other hand increase prices for buyers which incline to slows trade and diminish revenues for companies.

2.3.2 Company News and Performance

Company news and performance affect the share price directly through the signaling effect. This could be in the form of profits/losses, future estimated earnings, dividends and other relevant corporate information such as change of management or new projects. According to the signaling theory, financial data serves the purpose of forwarding information from managers to stockholders. Dividend announcements are also signaling mechanism. They inform current and potential stockholders about future profit prospects of their stocks in company (Osei, 2002).

2.3.3 Political Shocks

Political shocks locally and globally affect the equity market and economy in general. For instance, terrorist activity often leads to a loss of confidence and wait-and-see approach towards new or continued projects which causes a downturn in economic activity and equity prices in many sectors. New leadership of a government or a key institution like a central bank could have influence in terms of new policies which may help or hinder business, and as a result equity prices are affect.

2.4 Empirical Review

Over the years, there have been numerous empirical investigations to ascertain the interaction between macroeconomic factors and possible control on equity market performance. Some of relevant studies to this paper are discussed below.

Benaković and Posedel (2010) analyze firms' yields of Croatian financial market. The study estimated fourteen stocks and used six years' data (2004-2009) applying industrial production,

interest rate, inflation rates, market indexes and oil prices as indicators. Trend and depth of interaction among the variation in variables and yields were examined. Research findings point out that market indexes were statistically leading for all shares and had a positive link to yields. On the other hand industrial production, interest rates and oil prices similarly showed a positive relationship to yields, whereas inflation rate had a depressing impact.

Abugri (2006) conducted a research in four Latin American nations examining whether indicators namely exchange rates, industrial production, money supply and interest rate had sufficient bearing on financial market. Abugri found that worldwide variables remain constantly significant in describing yields in all stock markets. Nation's macroeconomic factors are noticed to affect markets at different significance and scales.

Najeb (2013) analyze the influence of financial market operation on economic development in Jordan, the results showed optimistic correlation between well-organized equity securities exchange and economic development, it was equally evidenced that in both short run and long run there exists resultant channeling of instruments over the influence of financial market growth on investment.

Robert (2008) carried out the investigation on bearing of macroeconomic forces on stock exchange earnings in four unindustrialized states of Brazil, Russia, India and China. Results stated insignificant interaction among current and historical market yields using macroeconomic factors, arguing that Stock Exchange of both countries indicate feeble form of market efficacy. Moreover, insignificant association was established between equity market index prices of the 4 countries, exchange rate and oil prices.

Rufus (2007) examined the interaction among selected macroeconomic indicators and Nigerian

Stock Exchange market, using Johansen's (1991) vector error correction model. Macroeconomic

Factors examined were consumer price index, industrial production index, oil prices, money supply and Treasury bill rate. The outcomes display that integrating relationship occurs between macroeconomic indicators.

Coleman & Tettey (2008) explored the leverage of economic indicators on performance financial market in Ghana sourcing three-monthly data, resolved that interest rates from banks deposit have hostile bearing on financial market performance. Research also discovered negative correlation between market performance and inflation, and that the said relationship takes time as result of the existence of period lag.

Ndunda (2016) analyzed the control of macroeconomic forces on operation of equity market of NSE. Result found the interaction linking equity market performance and macroeconomic factors was positive. Nevertheless, the research recognized that correlation relating exchange rate as determine by average annual exchange rate and equity market performance is contrary to that parallel coefficient in the model was negative.

Muchiri (2012) observes the result of macroeconomic elements on financial market operations at NSE, the study established that inflation rate and money supply had positive but inconsequential impact on security values although interest rate had a negative and unrelated influence on security values. Additionally, exchange rate showed negative and substantial leverage on share prices.

Oriwo (2012) study the interaction among macroeconomic forces and stock exchange performance in Kenya, the research applied secondary data ranging from March 2008 to March 2012. The study results found 91 –day T bill to have negative interaction with all share indexes of Nairobi stock exchange, whereas between inflation and NASI index proved to be weak.

2.5 Conceptual Framework

Mugenda (2003) explain that conceptual framework is a graphical illustration of interaction among variables in a research paper. It facilitates the investigator to identify expected correlation which exists between the variables faster and simply. Literally, the function of conceptual framework is to show correlation among the dependent and independent variables.

Independent variables   **Dependent variable**
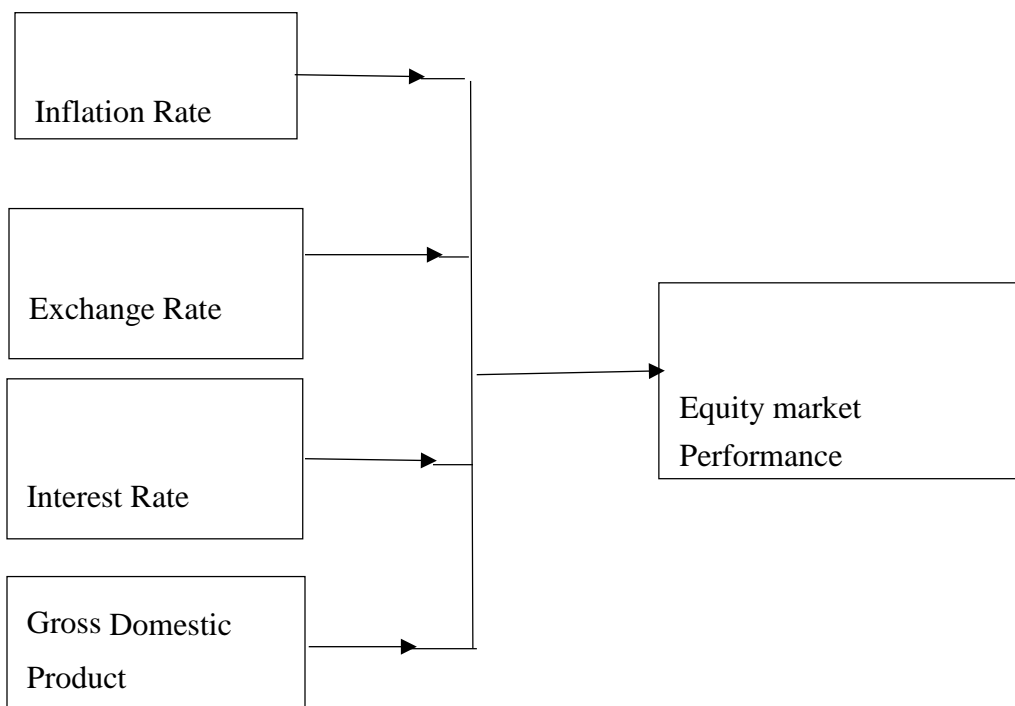
Source: Author (2020)

Figure 2.1: Conceptual framework

2.6 Summary of the Literature Review

Empirical review above written by diverse researchers show some finding have significant positive link among different macroeconomic indicators and financial market performance, despite the fact others have recognized the negative interaction. Some researches were conducted in various environment and hence the results may not be general to a developing country like Kenya.

For instance, results from study done by Benaković and Posedel, (2010) showed a positive correlation amongst macroeconomic forces and securities exchange performance while research done by Coleman and Tettey (2008) shows a negative correlation.

Meanwhile the studied research papers gave distinctive effects depending on macroeconomic factors involved in the research and the status of economic development of the nation of study and technique of investigation engaged, my take is that more researches should be done in the same area as what is already done is insufficient. Research papers done in Kenya have not taken into factor various macroeconomic variables and therefore the study will examine influence of the designated macroeconomic indicators on equity market performance in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The part deals with methodology modalities in general as prescribed in the below proceedings.

3.2 Research Design

Research design is a statistical approach which incorporates pragmatic proof of particular area of study. The investigation used descriptive research design. The study assessed the influence of designated macroeconomic aspects on equity market performance of NSE. According to Flick (2009) descriptive research design became broadly acknowledged in finance and economics specialization as it is demonstrating to remain very beneficial in strategy appraisals.

Descriptive research design approach was taken into account given it captures the objective of this study. The benefit of this design is that it allows the investigator to use numerous varieties of data as well as integrating human capability.

3.4 Data Collection

Applicable data for evaluation in this study is secondary data. The study used only four crucial macroeconomic forces namely GDP, exchange rates, interest rates and inflation rates. Quarterly time series data ranging from Jan 2010 - Dec 2019 was utilized. Secondary data was acquired from publication press and websites of the corresponding outlays. The sources are the Kenya Bureau of Statistics (KBS), Nairobi Securities Exchange, CBK and World Bank.

3.5 Diagnostic Tests

Diagnostic tests on data time series specifies evidence regarding how data might be modeled. To determine the viability of the study model, the researcher carried out several diagnostic tests, which include normality test, test for multicollinearity, test for homogeneity of variances and the autocorrelation test. The normality assumption assumes that the data will be normally distributed and the assumption will be determined using skewness, kurtosis and the Shapiro Wilk test. In the case where one of the variables is not normally distributed it will be transformed and standardized using the logarithmic transformation method. The homogeneity of variance assumption was assessed using the Levene test and the plotting of residual plots. In case, the data fails the test, the study used robust standard errors in the model.

Multicollinearity on the other hand refers to the correlation among the variables and assessed using the correlation matrix and the Variance Inflation Factors (VIF) where a VIF of more than 10 will be an indication of multicollinearity. Any multicollinear variable be dropped from the study and a new measure will be selected and substituted with the variable which exhibits co-linearity. Finally, serial correlation (autocorrelation) will be assessed using the Durbin Watson statistic where a value of 1.5 and 2.5 will indicate the absence of autocorrelation and incase the assumption is violated the study will employ robust standard errors in the model.

3.6 Data Analysis

Secondary data gather is structured in spreadsheets for the goal of investigation. The data is evaluated by means of Stata version 15. Outcomes of the study is structured in tables and graphs were necessary. Multiple regression was applied in analysis of data to get link among macroeconomic elements and equity market performance of NSE. This is the traditional method

of producing expected result of each variable, namely independent variables from four forecaster variables and dependent variable. The regression model below is the ideal for this analysis.

$Y = α + β1X1 + β2X2 + β3X3 + β4X4 + ε$ Where;

Y – NSE performance

a - Is a constant, intercept of the equation.

β1 - β4 is the regression coefficient of the independent variables

X1 – Inflation as measured by quarterly inflation rate.

X2- Exchange rate as measured by the natural logarithm of currency exchange rate between KSH and US Dollars.

X3 –Interest rate as measured by average bank lending rates on a quarterly basis.

X4 – Economic growth as measured by GDP growth rate.

β –Evaluates correlation between independent variable x and dependent or gradient/lope of the regression aimed at gauging the extent to which change in Y is related to a unit change in X.

While ε – is the error term normally distributed about the mean of zero.

Results of examination is depicted in tables/graphs and deliberations is compose of mean, standard deviation and variances. Inferences are prepared from specific data under each subject and conclusion was illustrated from results (Cooper and Schindler, 2006). The strength of the model was tested at 5% significant level and coefficient of determination (R^2) was applied to determine whether macroeconomic indicators/indexes have a bearing on Equity market performance. And with regard to the association between the variables, the researcher used Pearson correlation.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This part focuses on the analysis, interpretation as depicted in proceeding tables below. Data of 10 years was collected from Central Bank of Kenya and Kenya National Bureau of Statistics and STATA 15 was used in analyzing the data covering descriptive statistics, correlation and regression analysis. Diagnostics test was carried out to ascertain the assumptions before proceeding with making inferences.

4.2 Descriptive Statistics

Descriptive Statistics was carried out on all the variables under the study. The specific statistics that were reported include, the mean, standard deviation, minimum and maximum value.

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Interest Rates	40	5.875	18	9.689583	2.654271
Inflation Rates	40	3.5374	18.7213	7.088389	3.391418
Log inflation rates	40	1.2634	2.9297	1.866659	0.388488
Exchange Rates	40	4.3418	4.6399	4.532576	0.094825
GDP	40	3.3	6.78	5.219333	0.812638

The findings in the Table 4.1 indicated that interest rates had a mean of 9.69+/-2.76, inflation rates, 7.08+/-3.59, exchange rates, 4.53+/-0.10, GDP, 5.21+/-0.86 and equity market, 8.09+/-1.40. The maximum values for interest rates, inflation rates, exchange rates, GDP and equity markets were

18.18.72, 4.64, 6.78 and 12.2 respectively while the minimum values were, 5.88, 3.54, 4.34, 3.3

and 6.8 respectively.

4.3 Diagnostic Tests

Diagnostic tests were conducted in order to ascertain the assumptions of data before making

inferences using regression analysis. The particular diagnostics that were conducted were

normality test, homogeneity test of variance, multicollinearity test and autocorrelation.

4.3.1 Normality Test

Normality testing was conducted to clarify if the data was normally distributed. First, kurtosis and

skewness were conducted and also the shapiro-wilk. The rule of the thumb is that zero skewness

and kurtosis imply perfect normally distributed data while that of between -1 and +2 shows that

the data is normally distributed, although with incidence of slight negative or positive skewness.

Table 4.2 below contains values on Kurtosis and Skewness.

Table 4.2: Kurtosis, Skewness and Spiro Wilk

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Shapiro Wilk (Prob>z)
Interest Rates	40	1.495	3.046	0.710
Inflation Rates	40	1.954	3.829	254
Exchange Rates	40	-0.29	-1.436	584
GDP	40	-0.506	-0.277	0.665
Equity market	40	1.298	0.834	0.172

The findings revealed Kurtosis and skewness values were fall within the range of

+/-2 indicating that the data was normally distributed. Further shapiro Wilk results were presented

in Table 4.2. The null hypothesis for Shapiro Wilk is a variable is normally distributed in some

population. The premise is that if the significance level is >0.05, we consider the data is normally

distributed and if below 0.05, we presume the data has fallen short of normal distribution.

However for this study the findings revealed that the significance levels for all the variables was >0.05, signifying the data was normally distributed.

4.3.2 Homogeneity of Variance

The Lavene test was used to test homogeneity of variance. Levene's Test is used to determine whether two or more groups have alike differences as many tests use the assumption that groups have equal variances.

Table 4.3: Homogeneity of Variance

	Levene Statistic	df1	df2	Sig.
Interest Rates	44.563	9	12	0.360
Inflation Rates	9.153	9	12	0.125
Exchange Rates	392.323	9	12	0.182
GDP	10.189	9	12	0.680

Findings revealed that the variances for the variables were homogenous since the p values were

>0.05.

4.3.3 Multicollinearity Test

Multicollinearity was measured using the variance inflation factor as depicted by the table below.

Table 4.4: Multicollinearity Test

Variable	VIF	1/VIF
Interest Rates	1.501	0.666223
Inflation Rates	1.46	0.684932
Exchange Rates	1.378	0.725689
GDP	1.845	0.542005

The findings revealed that the VIF values for all the variables were less than 10 indicating, hence no multicollinearity was ruled out.

4.3.4 Autocorrelation

The Durbin Watson test is a statistic model which captures values ranging from 0 to 4, and it is in such a way that : 2 implies no autocorrelation, 0 to <2 means positive autocorrelation and>2 to 4 is negative autocorrelation. The findings indicated that Durbin Watson d-statistic 0.591 this means that there was a slight positive autocorrelation.

Table 4.5: Autocorrelation Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.875 A	0.766	0.739	0.707628	0.591

4.4 Correlation Analysis

The degree of the strength and direction of the association between the variables of the study was gauged by applying Pearson Correlation Coefficient.

Table 4.6: Correlation Coefficients

	Interest Rates	Inflation Rates	Exchange Rates	GDP	Equity Market
Interest Rates					
Inflation Rates	.418				
Exchange Rates	0.119	-0.086			
GDP	-.456	-.559	0.29		
Equity Market	-0.171	.329	-.801	-.393	

Correlation Coefficients indicated that interest rate is negatively correlated with equity markets performance (r=-171). Exchange rates on the other hand is positively correlated with equity markets performance (r=0.329). The findings agreed with those by Ndunda (2016) who found that correlation relating exchange rate and equity market performance was negative. GDP is negatively correlated with equity market performance (r=-0.801). On the other hand, inflation rate is

Positively related with equity markets performance (r=0.393). This implied that a unit rise in each variable would amount into -0.171, 0.329 and -0.801 and 0.393 change in equity market performance.

4.5 Multiple Regression Analysis

Multiple regression analysis was undertaken and the R square, ANOVA and significance levels reported.

Table 4.7: Model Fit

R	R Square	Adjusted R Square	Std. Error of the Estimate
.875a	0.766	0.739	0.707628

The findings produced R Square of 0.766 implying the independent variables explained 76.6% of the dependent variable. This indicates the overall model was fit and the rest 23.4% was attributed to other variables not in the study.

Table 4.8: ANOVA

Source	SS	Df	MS	F	Sig
Model	57.412	4	14.353	28.664	0.000
Residual	17.526	35	0.501		
Total	74.938	39			

So as to ascertain the significance of each variable individually variable in this research as a predictor of the equity markets performance, P-value was utilized to indicate how significant the connection between the main variable and the independent variables. Confidence level at 95% and value of p below 0.05 was understood as an index of statistical significance of the concepts. Therefore, a p-value more than 0.05 depicts an insignificant the variables. The ANOVA output alluded the model was generally significant given the significance level was 0.000 <0.05.

Table 4.9: Regression Coefficients

Equity Market	Coef.	Std. Err.	T	P>|T|	[95% Conf. Interval]
Interest Rates	-0.148	0.051	-0.283	-2.886	0.007
Inflation Rates	0.124	0.041	0.304	3.003	0.005
Exchange Rates	-10.197	1.307	-0.698	-7.801	0.000
GDP	-0.257	0.189	-0.151	-1.359	0.183

The regression coefficients revealed that the independent variable interest rate was negatively but significantly related with Equity markets performance (β=-0.148, p=0.007). The findings concurred with Coleman & Tettey (2008) who established that interest rates have hostile impact on financial market performance and Muchiri (2012) who indicated that interest rate had a negative but irrelevant influence on security values. These findings disagreed with those by Benaković and Posedel (2010) who found that interest rates, had a positive relationship to stock yields. Inflation rates was on the other hand found to positively and significantly affect equity markets performance (β=0. 124, p=0.005). The study findings were in agreement with these by Muchiri (2012) who found that inflation rate had positive impact and Oriwo (2012) who found a weak positive link. The variable exchange rate was also found to be negatively but significantly related with equity markets performance (β=-10.197, p=0.000). The findings contradicted with findings by Najeb (2013) whose findings showed optimistic correlation between well-organized equity securities exchange and economic development. The finding also however agreed with those by Robert (2008) who established an insignificant interaction among corresponding exchange rate and equity market index prices. Gross Domestic Product variable was on the contrary found to negatively and insignificantly affect equity market performance (β=-0.257, P=0.183).

The overall model is then represented as follows;

$Y=\alpha+ -0.148X_1+0.124X_2+-10.197X_3+-0.257X_4$

Where

Y= Equity markets performance

X_1 = Interest Rates

X_2= Inflation Rates

X_3=Exchange Rates

X_4=GDP

4.4 Interpretation and Discussion of Results

The study aimed at determining the leverage of the economic indicators considered for this study as prescribed in the model on equity market performance of Nairobi stock exchange. The association between such variables was assessed by way of regression analysis where the coefficients and the p values were checked.

The findings were that, among the selected macroeconomic variables inflation rates, interest rates gross domestic product were negatively correlated with equity markets performance while exchange rate was positively correlated with equity markets performance. The model fitness results of regression revealed that the independent variables explained a high percentage of the dependent variable indicating the model was fit. The ANOVA findings on the other hand revealed model was generally significant. The regression coefficients results on the other hand revealed differing findings on the link between the dependent variables and the individual independent variables. Out of the four independent variables, only inflation rates was discovered to be positively and significantly associated with equity markets performance. Although the relationship between interest rates, exchange rates and dependent variable

Equity markets performance was significant, the variables were negatively related. The variable economic growth as measured by GDP was found to be negatively and insignificantly related with equity markets performance.

The study findings concurred Ndunda (2016) whose results found the interaction linking equity market performance and macroeconomic factors was positive and Abugri (2006) who found that worldwide variables remain constantly significant in describing yields in all stock markets. The study findings also concurred with the findings by Coleman & Tettey (2008) who established that interest rates have hostile impact on financial market performance and Muchiri (2012) who indicated that interest rate had a negative but irrelevant influence on security values while inflations rates had a positive impact. The findings also were in line with those of Oriwo (2012) who found a weak positive link and findings by Robert (2008) who established an insignificant interaction among corresponding exchange rate and equity market index prices. On the other hand, the findings disagreed with the findings by Benaković and Posedel (2010) who found that interest rates, had a positive relationship to stock yields. The findings also contradicted with findings by Najeb (2013) whose findings showed optimistic correlation between well-organized equity securities exchange and economic development

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The section specifies synopsis of the findings discussed in the previous chapter, conclusions, recommendations, limitations and suggestion for further studies in the same area.

5.2 Summary of Findings

The study explored the effects of selected macroeconomic variables on the performance of equity market of NSE. For the sake of clarity, the four selected variables are gross domestic product, interest rate, exchange rates and inflation rate which the researcher found necessary and backed by various empirical studies to have the greatest impact on performance of NSE. The research covered the entire 64 firms quoted in the NSE as at March 2020, in other words the population is the sixty four firms listed on Nairobi stock exchange. The study utilized secondary data to assess the link between dependent variable independent variables, and the analysis was descriptive in nature.

As per the finding, both interest rate and exchange rate have negative impact but significantly related to equity market performance. On the other hand Inflation rate had positive and substantial effects on performance of Equity market. Further, Gross Domestic Product variable was on the contrary found to negatively and insignificantly affect equity market performance. The F statistic was also significant justifying the fitness of the model in describing the determinants of share prices.

5.3 Conclusion

Diagnostic tests revealed that the data was normally distributed, the logarithmic transformation was done to reduce the skewness, there is no autocorrelation and no multicollinearity.

The study found that interest rate was negatively but significantly related with Equity markets performance. The findings concurred with Coleman & Tettey (2008) who established that interest rates have hostile impact on financial market performance and Muchiri (2012) who indicated that interest rate had a negative but irrelevant influence on security values. These findings disagreed with those by Benaković and Posedel (2010) who found that interest rates, had a positive relationship to stock yields.

Inflation rates was on the other hand found to positively and significantly affect equity markets performance. The study findings were in agreement with these by Muchiri (2012) who found that inflation rate had positive impact and Oriwo (2012) who found a weak positive link.

The variable exchange rate was also found to be negatively but significantly related with equity markets performance. The findings contradicted with findings by Najeb (2013) whose findings showed optimistic correlation between well-organized equity securities exchange and economic development. The finding also however agreed with those by Robert (2008) who established an insignificant interaction among corresponding exchange rate and equity market index prices.

Gross Domestic Product variable was on the contrary found to negatively and insignificantly affect equity market performance.

5.4 Recommendations

The research found that the variables considered for the study had an impact on equity market performance. Future projections ought to look closely into the exchange rate and inflation rate in precise given they were the ones found to have the highest impact on the trajectory of equity market. The government through CBK should initiate regulatory mechanisms on currency regime in Kenya.

The research indorses that CBK cuts interest rates by reasonable margin as lower lending rates may improve performance of securities market. There is evidence which shows reducing interest encourages borrowers to take up more loans and invest in all sort of investments which is good for the economy.

5.5 Limitations of the Study

The study made use of secondary data already stored in public domains accessible to whoever wishes to utilize it for studies, there is no grantee such data was accurately, and if that is the case, that means such deficiencies might have been carried into the analysis, hence the study is not immune from errors, but that is not a mistake of the researcher.

The study is only limited to four major economic indicators i.e. interest rate, inflation, exchange rate, and GDP , and that means the study has limited scope given there are a bunch of other macroeconomic variables not considered.

The project considered shorter time period of 10 years data from 2010-2019, the results are limited to this time period.

The research variables were measured using regression analysis which assume that the cause and effect relationship between the variables remains unchanged. Regression equation may lead to

erroneous and misleading results.

5.6 Suggestions for Further Studies

The study measured four variables which involved inflation, Exchange rate, interest rate and GDP and hence commends that another study be done to ascertain the influence of more macroeconomic forces on the performance of equity market of Nairobi Securities Exchange in Kenya,

Similar researches can be carried out on other security exchange markets outside the country with the longer period than what is covered by this study.

More studies can be carried out with longer time period of data collection.

The study used regression analysis and other different approaches can be used in further studies e.g. Cointergration is recommended.

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APPENDIX 1

Listed companies at the NSE

AGRICULTURAL

Eaagads Ltd

Kakuzi Plc

Kapchorua Tea Co. Ltd

The Limuru Tea Co. Plc

Sasini Plc

Williamson Tea Kenya Ltd

AUTOMOBILES & ACCESSORIES

Car & General (K) Ltd

BANKING

ABSA Bank Kenya Plc

BK Group Plc

Diamond Trust Bank Kenya Ltd

Equity Group Holdings Plc

HF Group Plc

I&M Holdings Plc

KCB Group Plc

National Bank of Kenya Ltd

NIC Group Plc

Stanbic Holdings Plc

Standard Chartered Bank Kenya Ltd

The Co-operative Bank of Kenya Ltd

COMMERCIAL AND SERVICES

Deacons (East Africa) Plc

Eveready East Africa Ltd

Express Kenya Ltd

Kenya Airways Ltd

Longhorn Publishers Plc

Nairobi Business Ventures Ltd

Nation Media Group Ltd

Sameer Africa Plc

Standard Group Plc

TPS Eastern Africa Ltd

Uchumi Supermarket Plc

WPP Scangroup Plc

CONSTRUCTION & ALLIED

ARM Cement Plc

Bamburi Cement Ltd

Crown Paints Kenya Plc

E.A.Cables Ltd

E.A.Portland Cement Co. Ltd

ENERGY & PETROLEUM

KenGen Co. Plc

Kenya Power & Lighting Co Ltd Kenya Power & Lighting Co Ltd

Kenya Power & Lighting Co Ltd

Total Kenya Ltd

Umeme Ltd

INSURANCE

Britam Holdings Plc

CIC Insurance Group Ltd

Jubilee Holdings Ltd

Kenya Re Insurance Corporation Ltd

Liberty Kenya Holdings Ltd

Sanlam Kenya Plc

INVESTMENT

Centum Investment Co Plc

Home Afrika Ltd

Kurwitu Ventures Ltd

Olympia Capital Holdings ltd

Trans-Century Plc

INVESTMENT SERVICES

Nairobi Securities Exchange Plc

MANUFACTURING & ALLIED

B.O.C Kenya Plc

British American Tobacco Kenya Plc Carbacid Investments Ltd

East African Breweries Ltd

Flame Tree Group Holdings Ltd

Kenya Orchards Ltd

Mumias Sugar Co. Ltd

Unga Group Ltd

TELECOMMUNICATION

Safaricom Plc

REAL ESTATE INVESTMENT TRUST

STANLIB FAHARI I-REIT

EXCHANGE TRADED FUNDS

NEW GOLD ETF

Extracted from NSE website on 18/08/2020

APPENDIX 2

Secondary data excel sheet

Year	Quarterly Reports	Interest Rates	Log interest rates	Inflation Rates	Log inflation rates	Exchnage Rates	Log exchange rates
2019	1st Quarter	9.00	2.20	4.9425	1.60	4.61	1.53
	2nd Quarter	9.00	2.20	5.615	1.73	4.63	1.53
	3rd Quarter	8.75	2.17	5.04	1.62	4.63	1.53
	4th Quarter	8.92	2.19	5.20	1.65	4.63	1.53
2010	1st Quarter	6.88	1.93	5.08	1.63	4.34	1.47
	2nd Quarter	6.38	1.85	3.54	1.26	4.39	1.48
	3rd Quarter	6.00	1.79	3.68	1.30	4.39	1.48
	4th Quarter	6.42	1.86	4.10	1.40	4.38	1.48
2011	1st Quarter	5.88	1.77	8.30	2.12	4.41	1.48
	2nd Quarter	6.19	1.82	14.91	2.70	4.50	1.50
	3rd Quarter	13.13	2.57	18.72	2.93	4.54	1.51
	4th Quarter	8.40	2.06	13.98	2.58	4.48	1.50
2012	1st Quarter	18.00	2.89	15.92	2.77	4.42	1.49
	2nd Quarter	17.25	2.85	9.02	2.20	4.44	1.49
	3rd Quarter	12.00	2.48	3.98	1.38	4.45	1.49
	4th Quarter	15.75	2.74	9.64	2.12	4.44	1.49
2013	1st Quarter	9.50	2.25	4.09	1.41	4.45	1.49
	2nd Quarter	8.50	2.14	5.42	1.69	4.46	1.50
	3rd Quarter	8.50	2.14	7.64	2.03	4.46	1.49
	4th Quarter	8.83	2.18	5.72	1.71	4.46	1.49
2014	1st Quarter	8.50	2.14	6.69	1.90	4.46	1.50
	2nd Quarter	8.50	2.14	7.68	2.04	4.48	1.50
	3rd Quarter	8.50	2.14	6.29	1.84	4.50	1.50
	4th Quarter	8.50	2.14	6.88	1.93	4.48	1.50
2015	1st Quarter	8.50	2.14	6.13	1.81	4.53	1.51
	2nd Quarter	10.38	2.34	6.59	1.89	4.61	1.53
	3rd Quarter	11.50	2.44	7.01	1.95	4.63	1.53
	4th Quarter	10.13	2.31	6.58	1.88	4.59	1.52

2016	1st Quarter	11.50	2.44	6.59	1.88	4.62	1.53
	2nd Quarter	10.38	2.34	5.86	1.77	4.62	1.53
	3rd Quarter	10.00	2.30	6.46	1.87	4.62	1.53
	4th Quarter	10.63	2.36	6.30	1.84	4.62	1.53
2017	1st Quarter	10.00	2.30	8.77	2.17	4.64	1.53
	2nd Quarter	10.00	2.30	9.11	2.21	4.64	1.53
	3rd Quarter	10.00	2.30	5.50	1.71	4.64	1.53
	4th Quarter	10.00	2.30	7.79	2.03	4.64	1.53
2018	1st Quarter	9.75	2.28	4.3	1.46	4.62	1.53
	2nd Quarter	9.25	2.22	4.155	1.42	4.61	1.53
	3rd Quarter	9.00	2.20	5.63	1.73	4.62	1.53
	4th Quarter	9.33	2.23	4.70	1.54	4.62	1.53