

**EFFECT OF TREASURY BILL RATES ON CAPITAL MARKET
DEVELOPMENT: A CASE OF NAIROBI SECURITIES EXCHANGE.**

FRANK OMONYWA MOGAKA

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DECLARATION

The research is my original work. It hasn't been presented in any learning institution for an academic award.

Signature.....Date.....

FRANK OMONYWA MOGAKA

Reg. No: D61/84018/2016

This research project has been submitted for examination with my approval as the University Supervisor

Signature.....Date.....

Dr. Zipporah Onsomu,
Lecturer,
Department of Finance and Accounting,
School of Business,
University of Nairobi.

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DEDICATION

I commit this study to all those who supported and encouraged me throughout the research period.

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LIST OF ABBREVIATIONS & ACRONYMS

APT	Arbitrage Pricing Theory
CMA	Capital Markets Authority
CPI	Consumer Price Index
GDP	Gross Domestic Product
NSE	Nairobi Stock Exchange
TB	Treasury Bills

ABSTRACT

Across the globe, the Capital markets operates in an environment which has the capability of influencing its operations, development and its overall productivity. This study objective was based on establishing the effects of treasury bill rates on the development of capital markets in the Nairobi Stock Exchange. The Capital Market development as a dependent variable was measured by the market capitalization rates from the year 2015 to 2019. The independent variable factored in the study was the Treasury Bill rates. The control variables were: rate of inflation, rate of exchange and the interest rate. The study made use of secondary data from the Kenya Bureau of Statistics, Capital Markets Authority and the Central Bank of Kenya. Data was analyzed on the basis of Mean and Standard deviation, The F-Test statistic was 4.647 at 0.003 Significance level which shows regression model used was significant. From the regression model it was found out that the selected macroeconomic variables namely, treasury bill rates, inflation rates, interest rates and exchange rates influenced capital market development. The investigation established that the independent variables explains 30.2% of the capital market development and that the treasury bill rates affects negatively the development of the capital market whereas the inflation rates, interest rates and the exchange rates have a positive relationship with the capital market development. The study concluded that the selected macroeconomic variables do not significantly affect the capital market development in the Nairobi Stock Exchange. The study recommends the government and respective agencies involved in the planning and allocation process to devise more recent methodology in encouraging the general public and investors to increase their volumes in investment in the treasury Bills rates.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Interest rates dominate most if not the entire economic and business thinking of investors. The consequences of high interest rates on the economic development of a country, enterprise performance and the welfare of an ordinary individual are the key concern. Treasury bill rates are termed as the least risky rate and most marketable rate of all the security rates, (Elton & Gruber, 1995). They play an important part in financial market because of no risk of default in addition to their short-term maturities. Treasury bills have a direct influence on the development of capital markets, including macroeconomic factors such as exchange rates, interest rates and inflation rates. (Otieno & Mutoko, 2010)

The endogenous growth theory, the Arbitrage Pricing Theory (APT) and the Macroeconomist theory mainly explain connection between Treasury bill prices and the development of the Nairobi stock Exchange (NSE) capital markets. Endogenous growth theory states that a steady growth of the capital market is from within and not without, (Barro, 1990). The theory is geared in determinacy of long run effect of inputs in this case the rates on the treasury bills on outputs which is the capital market development. In this study, the treasury bill rates are considered as the endogenous factors of capital market growth. APT is also a key representation in the study which indicates how the Treasury Bill Rate has a responsibility of evaluating the returns of an asset. The model states that securities are mispriced in the general market, however the market ultimately rectifies the pricing fluctuation and securities return to their fair original value (Ross, 1976). At this point is where arbitrageurs take advantage of deviations from fair value.

The shift from the fair value is anticipated to happen due to the changes in the macroeconomic factor such as the treasury bills. The third theory anchored in this study is the Macroeconomist theory proposes a deviation from the common applications of factor analysis in the determination of the various variables that may affect the assets returns in the market. (Robinson, 1979)

The Kenyan capital market has recently been attached with the macroeconomic environment fluctuations such as the rates of treasury bills, inflation rate and the rates of exchange (Irungu & Muturi,2015).The Nairobi Stock exchange therefore acts as the indicator to capital markets development, hence the importance of defining the structures affecting volatility of stock returns (Olwenyi & Omondi, 2011) The listed firms in the NSE are expected to be sound and stable financially to safeguard the development of the capital Market (Maina & Sakwa, 2012).Since many investors use the stock exchange to make sound decisions on the type of investments to choose in regards to expected returns, security volatility as measured by the authority needs to be dependable and trusted in the market. (Muinga, 2018). According to Ngugi and Nyambura (2004) interest rates of the treasury bills are key measures of the dynamic changes in the money market. This makes this study key and relevant to expounding more dynamics on how the treasury bills would add value of affect the trust investors have in the NSE of the decisions made in context.

1.1.1 Treasury Bill Rates

Treasury bills are short-term government lending tools that raise short-term cash through their central banks. Treasury bills rates are least risky rates in capital market making the treasury bills to be the most marketable of all of the securities, Elton and Gruber (1995).

They are considered risk less investments in most economies. TB rates are mostly determined by the economic conditions. The rates are considered to be at their lowest during slow economic times when there is no much demand for money, and it's at its highest when the demand for money is high in that depositors will be rewarded highly when they hand over their money to the bank (Odipo, 2014)

Treasury bills interest is usually considered to be the representative monetary exchange rate. This is why the Treasury bill levels have a major impact on the shilling setting and on the overall interest rate setting. The base rate set by banks that determine borrowing costs is typically used as the variable-rate index rate as a measure of the default risk premium in private securities, the split between the private money and the interest bills. It is usually used for testing different hypotheses of how the inflation rate or distribution of finances over a short period affects interest rates.

If Central Bank of Kenya uses the open market type operations framework, the treasury bills become an essential signalling interest rate for implementation of monetary policy. The bill rate of the Treasury sends a signal of monetary policy while the operations of the open market are mainly driven by monetary policy objectives (Ngugi & Wambua 2004). The interest rates of the Treasury bill also are used to check hypotheses on the determinants of curves for the money market. The rate on Treasury Bills also acts as representative of money market rate, and their yields are used by banks to fix their own lending rates (Mutoko, 2006).

1.1.2 Capital Market Development

Capital market development is a vital module for financial sector development and complements role performed by both the banking sector and the central bank's monetary policies in development of the economy (Singh, 2014). The worth of Capital Markets as an effective channel of economic and financial intercession has always been perceived by the academicians and strategy creators as an essential determinant of monetary development of a state both created and creating (Smith, 2003). Capital market development is characterized by the presence of international integration, foreign investors participation, fair pricing of securities, market friendly regulations, trading of many securities which include the shares, bonds and derivatives, low volatility of market returns and clear regulations which do not conflict in the financial markets.

Capital markets are important in providing market liquidity which is helpful in implementing of projects with long term payoffs hence promoting the growth of an economy (liu, 2001). The capital markets help to reduce data costs by generating and distributing data on companies that lead to effective markets where prices include all current data. In addition, the capital markets enable investors to access resources and also facilitate injection of foreign financial resources in to the economy.

Robinson (2016) did an investigation within the nation of India and measured the growth in the capital market using the return on stocks and changes in the market prices. Imala (2015) on his study of effects of macro-economic variables upon capital market development in Nigeria also measured capital market development by the use of changes in stock market prices and return on stock. Whereas, Makau (2015), as a representation of

stock market performance, used gross domestic growth rate. The capital Market is an essential marker of securities exchange development since it shows how capital market assists in enhancing designation of capital and accordingly improving possibilities of long term financial development (McNeel, 2005).

1.1.3 Treasury Bill Rates and Capital Market Development

A large and abrupt upsurge in the Treasury bill rates signals overall growth in interest rates at large and this may lead to a distressing effect on the real variables, exerting a depressing pressure in on the Gross Domestic Product (GDP) of an economy at large. It is by the utilization of the Treasury bill rates that action on the monetary policy are channelled within the economy (Roley & Sellon, 1995).

When banks buy Treasury bills, it reduces the amount of money available in the economy for expansion and development, this is usually done by the Government snowballing the treasury bill rates making it good-looking to the investors. This leads to the crowding out effect whereby there is an elevation of the interest rates within the market due to the government increased borrowing in the money market. The macroeconomic theory argues that the low fluctuation of the returns on the capital market which is the cause of macroeconomic deviations in environment. With this argument it is clear that the Treasury bill rates directly influence the capital market development (Singh, 2014)

1.1.4 Nairobi Securities Exchange

It was in the 1920' when the establishment of the NSE took place and it was an informal market for trading and exchange of securities (NSE, 2015). There was lack of governance and rules in relation to broking and trading of a "gentleman's contract" during that

moment. In the 1950's It then evolved into a voluntary member organisation where trading was dominated and restricted to the elite Africans, Asians and Europeans. Since then the NSE has kept on evolving over the years overcoming the market confidence challenges of the 1970's and the transformations in the 1990's. NSE has been categorised as the most vibrant African Bourse, this is attributed to the innovations, automation of trading, electronic clearance and implementation of information management system (NSE, 2015).

The Nairobi Stock exchange has two major markets specifically: bond market and the market of stock. The stock markets deal with the trading of company shares and equities. The Nairobi stock exchange has listed 65 companies based on their different segments of trade namely: investment services, insurance services, commercial services, petroleum and energy, Investment, Allied and Construction, technology and communication, trust investment on real estate and a fund on exchange trading. The Bond market is where the trading of bill and bonds takes place. Corporate bonds, Treasury bill and Treasury bonds are traded in this market sector. Commercial paper is usually traded in this sector although the treasury bonds and treasury bills are the most traded in this segment. At the NSE there are indices which are used in monitoring the stock prices and their movements namely: the 20share index of the NSE, and an index of all the share at Nairobi Stock Exchange, Financial Times Stock Exchange Index and Market Capitalisation.

Nairobi Securities Exchange Stock prices listings have often responded to variations in the interest rates of implementing the policy on money according to CBK. Olweny and

Kimani (2011) pointed out that, in the short term, the Central Bank rate changes, which are the key monetary policy tool, have no short-term effect on stock prices.

1.2 Research Problem

The Treasury bill rate is the basis for examining returns from investment in financial assets such as stocks and bonds. Interest rate on Treasury securities is considered as the benchmark interest rate in modern economies. High bill levels promote stockholders to buy more public instruments. Therefore, treasury bills deal with stocks and bonds from inventors. It has resulted in a reduction of the bond market appetite which in turn results in possible decrease in stock prices. Thus there is a neutral but optimistic correlation between bonds and Treasury bill rates in relation to loan rates (Maghyereh, 2002). This relationship is positive.

In order to promote economic development, the bond is considered to be a major capital market, and a well-developed capital market is vital. Over the years, Kenya's economy has had various macroeconomic results. The Nairobi Securities Exchange also underwent a series of reforms in order to measure the income of foreign investors and to meet other emerging markets around the world. This is aimed at influencing the key economic industry and ensuring the attractiveness of the market to investors both local and foreign for the raising of capital. Majority of the investigations on how the macroeconomic measures have influenced Security market performance have covered developed economies, whereas much less studies covered emerging markets such as Nairobi Securities Exchange (Muchiri, 2012).

A research by McCombie and Thirlwall, (2016), on challenges of balance of payments and growth of economy established an existence of a positive significant influence of Treasury bill rates on the capital market growth of the 100 countries that were under review. A study by Malik (2014) attested to the fact that various macroeconomic variables shaped the capital markets in India after his survey for the years 2009 to 2013 on the capital market development. However, Kentur (2016) concluded that macroeconomic factors had insignificant effect on the capital market performance in Peru. In Kenyan context a study by Rono (2016) concluded that the Macroeconomics variables have a substantial influence on the capital market performance. However, Omar (2016) concluded that inflation rates and the interest rates affected the capital market performance in Kenya negatively.

From the literature reviewed there is limited evidence on specific macroeconomic variables and the influence of NSE in relation to the capital market. It is perceptible that from the studies carried out there is a conflicting finding how variables related to macro-economic development of capital markets creating a conceptual gap in literature. The studies have also not taken into consideration each macroeconomic variable and how it affects the capital market. The investigation seeks to determine the influence of Treasury bill rates on the capital market **development in the Nairobi Securities Exchange?**

1.3 Objective of the Study

To determine **the effect of** treasury bill rates on capital Market Development in the Nairobi Securities Exchange.

1.4 Value of the Study

The Government policy makers will advance their alignment of fiscal and monetary policies with an incentive for greater fiscal discipline and providing a stable macroeconomic environment for sustainable development (Mutoko, 2006). The Central Bank will be able to determine the best tools to select in inducing economic variables like interest rate and stock market indices by effectively combining operations of non-open markets with those of markets that are open.

The findings would also be relevant to Capital market Authority (CMA) who regulates the stock market. The results of the study would enable them to come up with policies that would make the capital market favourable for investment purposes through introduction of new instruments to be traded to attract investors. The findings will also help economic practitioners and advisors to understand the concept of and its implications on economic development in Kenya. The practitioners will thus be able to offer informed advice to the government and other relevant users on the importance of portfolio flows in an economy.

In addition, the investigations outcomes may be of great relevance the NSE administrators who are the key beneficiary of this investigation owing to the major role that they play in the implementation of government policies and channel portfolio flows take place. The NSE is the barometer of the economic health in a country and therefore the findings of the study would enable them to appropriately advise the government on the best practices that would encourage both treasury bills and capital market investment.

It would in addition assist the management to arrive at regulations that are better informed.

The investigation will also be used as reference material in literature review and thus will contribute to the pool of existing knowledge on treasury bills rates and the capital market in Kenya. Researchers and scholars will utilize the outcome of the investigation as reference sources and use it to establish and fill research gaps that they will come across.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section covers relevant resources upon which research will be underpinned. In particular, the section covers in detail the theories upon which the study will be anchored. In addition, the study gives a detailed discussion on the empirical works on study area. Lastly, this section provides literature pointing out the research gaps and the weaknesses of the existing works and how the investigation sought to address the existing research gaps.

2.2 Theoretical Foundation

Within the investigation area on the influence of Treasury bill rates on capital market development, three theories have been discussed. Which are: The Endogenous growth theory, Economist theory and the Arbitrage Pricing theory.

2.2.1 Endogenous Growth Theory

Endogenous growth model was developed by Barro (1990, 1991). It assumes that a steady growth is determined from within and not without. This model indicates that the capital market grows automatically in proportion to change in capital. This theory endeavours to explain the long run effect of inputs on outputs in this case treasury bills on capital market development. It further assumes that in a competitive economy firms face a competition amongst themselves based on the technology applied and the returns accrued. However cumulative capital also plays a critical role in productivity and thus capital market development.

The theory concludes that with constant return in capital, there is an incentive to invest since the slight product of capital is the same. The endogenous growth theory was geared

to explain economic growth in countries with focus on the links relating to treasury bill rates and capital market growth and they will influence growth through their effect on capital accumulation and spill overs like technology, innovation and skill transfer among others.

2.2.2 Arbitrage Pricing Theory

Ross Stephen in 1976, established this theory. Returns of economic assets can be shown in theory as a linear function, with several macroeconomic variables, with a certain beta factor which characterizes their sensitivity to changes in each factor. The resulting exchange model rate shall be utilized to evaluate the asset properly by matching the asset price with the expected period cost end to the cost of the model. If the price varies from arbitration, it should be reversed.

Using APT, arbitrageurs usually anticipate to take advantage of any deviations from fair market value. The model can at times result in a lot of statistical noise, but if observed for a particular factor it offers a clearer explanation of what changes the stock earnings. APT indicates the Treasury Bill Rate has a key role to play in the assessment of the returns of an asset. Thus, such information advances the understanding of the impact of Treasury Bill Rates on the return of assets in turn improving our knowledge and predictability of asset price movements.

2.2.3 Macroeconomist Theory

Robinson, (1979) proposed this theory to deviate from the common applications of factor analysis in the determination of the various variables that may affect the assets returns in the market. The macroeconomic variables have been measured by some

scholars and found evidence that, Treasury bill rates are correlated with capital market growth when macroeconomic variables like; exchange and lending rates are held constant. This is supported by French and Poterba, (2014) who concluded that any differences in the rate of inflation are captured in totality in the stock prices thus triggering monetary policies such as treasury bills sales.

The macroeconomist theory analyzes the volatility of market returns for macroeconomic changes. The approach suggests that, the capital market authority activities are influenced by change in macro-economic variables like the Treasury bill rates. This approach is based on equilibrium theory which assumes the interrelations which exists between the various sectors as a critical aspect in understanding the macroeconomic movements. The relevancy of this theory cannot be underestimated since it determines how capital market development is affected by varying macroeconomic which have causal sequence on the monetary policies (French & Poterba, 2014)

2.3 Determinants of Capital Market Development

Capital market development can be influenced by various factors among which include: Legal and regulatory framework, interest rates, currency strength and government spending.

2.3.1 Interest Rates

Interest rates can influence the development of an industry in quite a lot of ways. A rise in interest rates may prevent clients from borrowing to finance the purchase of such products and services in sectors like vehicle manufacturers or real estates which have a high-value industry. In addition, high interest rates prevent enterprises from investing

and expanding fresh assets. On the other side, declining interest rates could motivate sectors to develop, leading to greater levels of jobs, more expenditure and more GDP.

2.3.2 Exchange Rate

The value of the Kenya shilling equated to other foreign currencies and especially the U.S. dollar is significant even for companies that do not deal in import and exports. When Kenya builds up, businesses that buy input from other nations can be more pricing competitive. The sector can be increased or depressed in sectors which depend exclusively on foreign raw products and processing, such as garments, by enhancing or weakening the shilling. Investment in foreign nations with stable currencies and powerful governments will tend to flow. In order to attract capital from foreign investors, a state requires a fairly stable currency. Or the outlook for currency depreciation losses could discourage investors from abroad, which in turn slow down the growth of the industry.

2.3.3 Legal and Regulatory Framework

Legal and regulatory framework entails the various statutes put in place aimed at protecting the capital market investors. The assets rights are plainly spelt out in these rules and regulations which supports even private agreements which are key in the functioning of the capital markets. The regulations ensure that all stakeholders are protecting including even the minority investors in the capital market. For the capital market to grow the government has to ensure that all the legal and regulatory framework is just and not prohibitive in nature.

2.3.4 Government Spending

For the period 1963 to 2008, Maingi (2010) carried out a study on public spending on Kenya's financial development. Over the course of the long term expenditure has beneficial influence on economic development, training, defence, administration, public investment and utilities as well as physical infrastructure. Public order and domestic safety, in the brief term, also have a beneficial effect on financial development while servicing government debt has a downbeat impact on financial development.

The Government has majorly contributed in establishing a build-up in the economic pattern through reforms in government expenditure, directly determining the amount of funds an economy needs to reroute towards self-utilization. If a state is interested in sustaining long-term development, government spending reform in the field of privatization is a prudent concern. Budget streamlining, governance, downsizing and externalization are also seen as suitable short-term measures for enhancing economic growth.

2.4 Empirical Literature Review

Tsuda and Arslanalp, (2015) were seeking to examine the role played by domestic financial markets on his study on emerging market portfolio flows. In doing so the study sought to determine the nexus between capital flows and a countries money supply and its effects of economic expansion. The particular attention of the study was African countries for a period of 1990 to 2007. Using the Instrumental Variable Generalized Method for estimation, the study established that private equity portfolio flows and foreign private debt flows negatively affected on the treasury bill rates in African

economies. This finding was found to hold for the nations having weak market in financial base domestically. Notwithstanding, the reverse was concluded for the economies with strong domestic financial markets since they were capable of converting the negative effects of foreign equity portfolio into treasury bills.

Chong *et al.* (2010) investigated how Foreign Direct Investment, portfolio investments and foreign debt flows affect economic development. The study focused on both then developed and developing economies globally. They focused mainly on the portfolios that are directed into the country through the domestic stock markets of the recipient countries. The study found that the portfolio investment mainly measured by private equity flow and foreign debt negatively affects the treasury bill rates in the developed and developing economies. However, the foreign direct investments were found to positively impact the economic growth of the recipient economy. However, the study reiterates that though private equity flow and foreign debt are an indicator of capital market growth, they negatively affect economic growth since developments in the stock markets arising from such flows tend to benefit few individuals in the recipient countries to a larger extent.

McCombie and Thirlwall (2016) analysed the effect of capital market growth on the treasury bills for 100 countries within the 1990-2010 period. The investigation finds a positive considerable influence of Treasury bill rates on the capital market growth of the economies under review. However, regarding the influence of capital market development and the economic development in specific money supply, the investigation found a small less stable significant influence. In terms of significance the effect was

insignificant, as far as private equity growth, the study established no significant effect on the treasury bills maturity the study concludes that capital markets development is negatively affected Treasury bill rates. The connection of monetary policy with the growth of the capital market in Turkey for the era 1990–2012 was examined by Mucuk et al (2014). The research discovered that the linkage between monetary policy in the issuance of particular treasury bills and capital market growth is not important with the co-integration analysis structure.

Nyang'oro (2013) did a study on the stock market accomplishment and flow of foreign portfolio within Kenya. The focus was the NSE. It analysed how Treasury bill rates influence the stock market accomplishment through the model of multi-factor pricing and structural vector autoregressive model. The study findings were that Macroeconomic factors, particularly exchange rate differences and Treasury bill rate, improve returns. Short term flows affect monetary stability by reducing the interest rates over time and leads to currency appreciation. The study also found out that the exchange market pressure is mainly exaggerated by changes in exchange rate and not by short term flows. The foreign treasury bill rates rises stock prices via induced demand. From the study findings, exchange and interest rates significantly determined stock market performance mainly the market capitalization.

The impact of the Treasury bill prices on stocks return was analyzed by Odhiambo and Mutoko (2010) using the Garch model. The research recognized that popular analytical methods like OLS regression are not suited to efficient prediction models and are peculiar to economic series information. The results of multiple market segments within the NSE were systematically investigated for these features, which served as the grounds for use

of GARCH analyses. The findings of the OLS regression were lastly contrasted with the outcomes acquired by GARCH analysis methods. They found that the Treasury bill rates affect asset yields significantly on all business yields and that GARCH assessment provides an improved account of the connection between the Treasury bill prices and asset returns.

Odipo, (2014) similarly conducted an investigation on information content on the treasury bill rates where she investigated the semi strong form efficiency of the Nairobi Securities exchange by finding out the information content of Treasury bill rates. She used Event study methodology where the 90-day Treasury bill rates represented the event under study and the event window being 5 days prior and 5 days following the pronouncement day. Statistical analysis was carried out using Microsoft excel and SPSS packages and the results indicated that there existed a considerable statistical variation between comparison period returns and event window returns in thirteen of the sixteen sampled companies. However, graphs of Cumulative Abnormal Returns did not support patterns that indicated information content of Treasury bill rates both prior to and after the Treasury bill announcement date.

2.5 Conceptual Framework

This research examines the influence of treasury bill rates on the growth in capital markets in Kenya. The independent variable was bill rates for treasury, while the dependent variable was development of the equity market. The independent variable would be measured using the Treasury bill rates issued by CBK whereas the growth of

the capital market will be evaluated using capitalization of the market as outlined in figure 2.1.

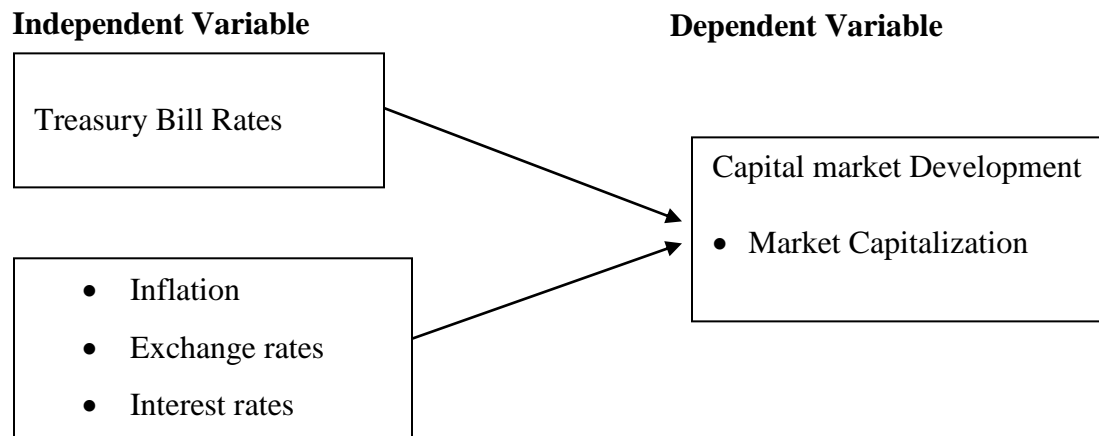


Figure 2.1: Conceptual Framework

Source: Researcher.

2.6 Summary of Literature Review and Research Gap

An examination of literature review shows that several studies focus in capital flows effects on economic development. With majority of them focusing on both equity and debt flows linking variables such as GDP and stock market performance (Nyang'oro, 2013). Studies conducted on economic growth have focused on international capital flows (Aizenman, Jinjara & Park, 2013), external debt (Were, 2001; Magana, Owino & Mutai, 2008). Finally, it is evident that most of the studies done on the effects of Treasury bill rates on capital market development have been conducted on other emerging economies such as china, Latin America and other Asian countries. The

findings of the studies relating to the development of the economy and growth of the market have been inconclusive in their findings and conclusions with mixed results being reported. Further, the local studies based on the Kenyan context the researchers fail to consider the influence of Treasury bill issuance has on the economy and subsequently on the capital market growth.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Discussed in this section are the strategies put in place to answer the questions of this investigation addressed by this report. This chapter specifically outlines the research design adopted, theoretical model upon which it will be anchored, empirical model to be estimated.

3.2 Research Design

Descriptive studies were designed for research. It is considered the most appropriate, as it examines in-depth features of the studied population. In this case the investigation focused on establishing the link between the capital market accomplishment and the Treasury bill rates.

3.3 Population of the Study

A population entails the amalgamation of items to be investigated (Mugenda, 2005). This report is a census of the Nairobi Securities Exchange's coded companies. There are 65 listed organizations in NSE as at August 2019. Their stock returns through the Market Capitalization will be analysed together with the selected macroeconomic factors, i.e. 91day T-Bill rate, level of inflation, rate of Exchange and the Lending rate.

3.4 Data Collection Techniques

Secondary data was relied upon in this study. It will be collected from the Capital Markets Authority (CMA), NSE, Kenya National Bureau of Statistics (KNBS) and the Central Bank of Kenya (CBK). A time series of monthly data spanning from September 2015 to August 2019 will be used employing 48 data points enough for effective

inference. The data to be collected includes Treasury bill rates, Interest rates and Inflation rates. The NSE Market Capitalisation will be the average measure of performance of all listed companies in the NSE spanning through Manufacturing, banking, Service companies, Real estate and Insurance.

3.5 Data Analysis

This process is defined as act of bringing order and meaning to data collected (Mugenda, 2005). Secondary data was collected, tabulated and analysed for various descriptive statistics. Bivariate correlation techniques were utilized to evaluate the association between the variables, while regression examination was conducted with an aim of determining links between the variable according to the analytical model.

3.5.1 Diagnostic Tests

Diagnostic examination was conducted on the sets of data to ascertain it meets the basic assumptions of the linear regression model included: Shapiro-Wilk which tested for normality, the P-Values are greater than 0.05 then the data is normally distributed. Multi-Collinearity test were carried out to determine intercorrelation among the independent variables.

3.5.2 Analytical Model

The study will employ a linear regression model as indicated

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \mu_i$$

Where:

Y - Capital Market development (NSE performance).

- X_1 - 91 T-Bill rates
- X_2 - Interest rate
- X_3 - Inflation rate
- X_4 - Exchange rate
- β - Various regression coefficients
- μ - The error term

3.5.3 Operationalisation of the Study Variables

This section gives details on how to quantify the selected variables on the model for analysis purposes as presented in Table 3.1.

Table 3.1: Operationalisation of the Study Variables

Variables	Scale of Measurement	Source
Market Capitalisation	Ratio	Kemboi (2018)
91-Treasury bill rates	Ratio	Mutoko (2010)
Interest Rates	Ratio	Muchiri (2012)
Inflation rate	Ratio	Tola (2018)
Exchange rate	Ratio	Muchiri (2012)

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter analyses data as specified in the research methodology, and gives findings of the study. The study was aimed at defining the effect of Treasury bill rates on Capital Market Development, a case study of Nairobi Stock Exchange. The determinant for market capitalization in this study was the 91-Treasury Bill. The market capitalization rate for NSE in Kenya is examined from the year 2015 to the year 2018. Each section has deliberated the findings, majorly on the treasury bill rates and its effects towards capital market development. The main section of this topic are the data analysis and presentation.

4.2 Descriptive Statistics

The objectives of the study were pegged upon the major rates impacting market capitalization at the Nairobi Stock Exchange. A descriptive analysis was done in each case for the period of 2015 to the year 2018 as presented in Table 4.1.

Table 4.1: Descriptive Statistic Analysis

Variables	Minimum	Maximum	Mean	Std. Deviation
91-Treasury Bill Rate	6.16	21.65	8.5675	2.401
Inflation Rate	4.53	8.4	6.3217	1.19627
Interest Rate	12.45	18.3	14.3417	2.05317
Exchange Rates	3	11.5	7.0337	2.28646

Table 4.1 shows a brief of the outcomes of the data regarding the effect of treasury bill rates on capital market development in the NSE. The key determinants of treasury bill rates was 91 day level of Treasury bill, degree of inflation, interest rate and exchange rate.

From the findings the lowest mean spread was 6.32 rate with a standard deviation of 1.19 depicting inflation rate and the highest mean was 14.34 with a standard deviation of 2.05 depicting interest rate. Standard deviation in this study shows a single data meaning that there is a big gap between the standard deviation and the mean of variables under the study.

4.3 Diagnostic Tests

4.3.1 Normality Test

Shapiro-Wilk test was conducted with an aim of determining details of Normality of the data as presented in table 4.2.

Table 4.2: Test for Normality

Tests of Normality		
	Shapiro-Wilk	
Statistic	Df	Sig.

91-TB rate	.902	48	.167
Inflation rate	.910	48	.216
Interest rate	.880	48	.087
Exchange rate	.930	48	.380

According to the Shapiro-Wilk output, the significance value (sig) of Market Capt rate , 91 TB rate ,Inflaton rate, Interest rate and exchange rate is 0.167 , 0.216 , 0.087 and 0.380 respectively. Since the figures are more than 0.05 it can be concluded that the variables are **normally distributed** therefore a study can be carried out with statistical analysis.

4.3.2 Multi-Collinearity Test

There was need to examine the state of multicollinearity between independent variables. This was done by use of multicollinearity aspect as shown in Table 4.3.

Table 4.3: Test for Multi-Colinearity

Coefficients^a

Model	Collinearity Statistics	
	Tolerance	VIF
Inflation Rate	.784	1.275
Interest Rate	.700	1.429
Exchange Rates	.695	1.440

Market Capt Rate	.861	1.162
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a. Dependent Variable: 91-Treasury Bill Rate

Form Table 4.3 above the VIF(Variance of Inflation Factor) for inflation rate is 1.275, Interest rate 1.429 , Exchange rate 1.440 and Market cap rate is 1.162. The VIF Figures are all between 1 and 10 meaning that the results show there is no multicollinearity symptoms as stipulated by Sanders et al (2013).

4.4 Correlation Analysis

The researcher sought to ascertain the correlation among the dependent and independent variables by the use of Pearson’s correlation coefficient. This is shown in Table 4.4.

Table 4.4: Correlation Analysis

		Correlations				
		Market Capt Rate	91- Treasury Bill Rate	Inflation Rate	Interest Rate	Exchange Rates
Market Capt Rate	Pearson Correlation	1				
	Sig. (2-tailed)					
91-Treasury Bill Rate	Pearson Correlation	-.341**	1			
	Sig. (2-tailed)	.002				
Inflation Rate	Pearson Correlation	.273	.166	1		
	Sig. (2-tailed)					

	Sig. (2-tailed)	.060	.260			
Interest Rate	Pearson					
	Correlation	.314*	.434**	.313*	1	
	Sig. (2-tailed)	.030	.002	.031		
Exchange Rates	Pearson					
	Correlation	.131	.532**	.400**	.480**	1
	Sig. (2-tailed)	.376	.000	.005	.001	

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

* . Correlation is significant at the 0.05 level (2-tailed).

Results from Table 4.4 above depict that a negative relation exist between the Treasury bill rates and the Capital Market development since the correlation coefficient s -0.341 though it's significant at 0.002 which is less than 0.05. This means that a decrease in the 91-treasury bill rate by the government results to the decrease in market capitalisation rate at NSE because more investors will go for the treasury bills.

The findings from the table 4.3 analysis above depict the relationship between the variables if there is any existence amongst them. The variable 91 TB rate, Inflation rate, Interest rate and exchange rates had a correlation coefficient of -0.341, 0.273, 0.314 and 0.131 respectively. The results also show that Treasury bill rates and Interest rates were significant with all figures less than 0.05. The inflation rate was insignificant at 0.060 which is greater than 0.05 and exchange rate was also insignificant at 0.376 which is greater than 0.05.

4.5 Regression Analysis

There was need to examine the relationship between the market capitalization rate and the subsequent capital market development. This is depicted in the following sections.

4.5.1 Model Summary

Table 4.5: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.549 ^a	.302	.237	2.23764

a. Predictors: (Constant), Exchange Rates, Inflation Rate, Interest Rate, 91-Treasury Bill Rate

The results from the analysis in Table 4.5 above show that there exists a moderate positive relationship between the study variables since the $R=0.549$. The adjusted R square is 0.237 implying that a difference of 23.7% is explained for by the regression model. The remaining (100-23.7) 76.3% of variation can be accounted for through attributes not factored in the model.

4.5.2 The ANOVA Table

Table 4.6: ANOVA Table

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
	1	93.078	4	23.269	4.647	.003 ^b
	Residual	215.303	43	5.007		
	Total	308.381	47			

a. Dependent Variable: Market Capitalisation Rate

b. Predictors: (Constant), Exchange Rates, Inflation Rate, Interest Rate, 91-Treasury Bill Rate

From the Table 4.6 above, The ANOVA test produced an F-statistic value of 4.647 at 0.003 level of significance. This shows that the regression model used for the study can be said to significant because the p value is 0.003, which is less than 0.05. It can be inferred with confidence that the independent variables (Exchange Rates, Inflation Rate, Interest Rate, 91-Treasury Bill Rate) used affect the market capitalisation rate at the Nairobi Stock Exchange in either way.

4.5.3 Regression Coefficient

Table 4.7: Regression Coefficient

Coefficients ^a				
Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.

	B	Std. Error	Beta		
(Constant)	20.032	2.603		7.695	.000
Exchange Rates	.026	.166	.493	3.164	.003
Inflation Rate	.030	.303	.266	1.882	.067
Interest Rate	.013	.189	.170	1.122	.268
91-Treasury Bill Rate	-.358	.188	-.320	-1.906	.063

a. Dependent Variable: Market Capitalisation Rate

The data resulted from an equation of regression in the Table 4.7 above is as follows:

$$Y = 20.03 - 0.358X_1 + 0.013X_2 + 0.030X_3 + 0.026X_4$$

The P value of Exchange rates is 0.003 which shows that the variable has a statistical significance to the market capitalisation rate since it is less than 0.05. Inflation rate had a P value of 0.067 which is greater than 0.05. This means that the inflation rate variable had a statistical insignificant impact on the market capitalisation rate. Interest rate had a p value of 0.268 which is greater than 0.05. This means Interest rate had a statistically insignificant impact on the market capitalisation since the p value is greater than 0.05. Finally the 91 Treasury bill rate had a p value of 0.063 which is greater than 0.05, which means it is statistically insignificant. There is no impact of 91 Treasury bill rate on the market capitalisation. The findings of the regression analysis shows that exchange

rates are positively related to the capital Market development. This implies that any unit increase in the Exchange rate Will lead to an increase in Capital Market development by 0.026. The study further confirmed that Inflation rate is also positively related to the capital Market development which implies that a unit increase in inflation rate leads to an increase in Capital Market development by 0.030. Interest rates were found to positively relate with the capital market development. A unit increase in Interest rates leads to an increase in the capital Market development by 0.013.

4.6 Discussion of Findings

The study found that interest rates influence the capital market development (French & Poterba, 2014). First, the findings depict that treasury bill rates affects negatively the performance of capital market development in terms of market capitalisation. An increase in the value of the 91-Treasury Bill rates resulted in a decrease in the market capitalisation. The findings are in line with study findings of Odhiambo and Mutoko (2013) who found that the treasury bills prices on stocks have a high negative impact on the returns on invested instruments in the markets.

The findings showed that there was an insignificant impact of 91 day treasury bills on the capital market development. These findings support this conclusion since this study has shown that there is an insignificant effect of 91 day treasury bills on the capital market development meaning that investors and firms ought not to be worried much on any prospect adjustments on the 91 day treasury bills in relation to investments. This supports Nyangoro (2013) study on stock market performance which shows insignificant impact.

This research established the existence of a positive relationship linking the development of the capital market to the interest rate. This signifies that an increase in the development of the capital market is attributed by the interest rate. This is in congruence with Tola (2018) findings. The study findings also depicted a positive correlation linking the exchange rate and the market capitalisation rate. The findings are in congruence with Chong et al. (2010) who investigated how Foreign Direct Investment, flow of foreign debt and investment in portfolio affect economic growth. The research in overall concluded that the 91 Treasury bill rates as the independent variable and Interest rates, Inflation rates and Exchange rates do have effect on the capital market development. This study concurs with the study done by Kentur (2016) who in conclusion stated that macroeconomic variables have an effect on capital market development in Peru.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

A summary of the outcome is presented in this section according to the study objective. It is the final chapter and therefore serves as a conclusion of the study. The chapter also has limitations encountered during the study, recommendations to policy makers and concludes with a proposal for subsequent investigations.

5.2 Summary

Summary of the data findings in this investigation show that there is effect of treasury bill rates on capital market development in the NSE. The determinants under this study were, 91 day Treasury bill rate, inflation rate, interest rate and exchange rate. From the findings the lowest mean spread was 6.32 rate with a standard deviation of 1.19 depicting inflation rate and the highest mean was 14.34 with a standard deviation of 2.05 depicting interest rate. The findings also show is a positive link existing that relates to the attributes of the investigation since the $R=0.302$.

The adjusted R square is 0.237 implying that 23.7% of variation is explained for by the regression model. The remaining (100-23.7) 76.3% of variation can be described by other attributes not factored in the model. The ANOVA test produced an F-statistic value of 4.647 at 0.003 level of significance. This findings showed that the regression model used for the study can be said to considerable due to the p value of 0.003, which is less than 0.05.

The findings show capital market development is influenced by the exchange rate significantly due to it having a p value figure that is less than 0.05, however the inflation rate, interest rate and 91 treasury bill rate had were insignificant since they posted a p value greater than 0.05. However there was a positive increase in Exchange rate with a change of one unit if all factors are kept constant, A unit change in inflation rate also had an associated impact of 0.03 on market capitalisation with all factors remaining constant. A unit change in interest rate had an associated impact of positive 0.013 on the market capitalisation. However a unit change on the treasury bill rate had an associated negative impact of -0.358 on the market capitalisation rate.

5.3 Conclusion

The study concludes that the existence of a link which is negative linking the rate of treasury bills and the capital market development. Therefore, it can be implied that an increase in treasury bill rate will lead to an decrease in capital market development due to the fact that is depicts an expansionary economy. A positive relationship exists between the inflation rate and the capital market development and again the correlation coefficient shows it was not significant and that with an increase in the inflation rate leads to increase in the capital market development.

The study showed that there is a positive relationship between interest rate and market capitalization rate. This relationship implies that an increase in interest rates will positively affect capital market development. A positive relationship also was exhibited by the Exchange rates and as well it was not significant. This implies that an increase in Exchange rates will lead to an increase in capital markets. Based on the outcome of this

research, it concludes that capital market development is affected by treasury bill rates, exchange rates, inflation rates and interest rates since all these variables depict different implications on the performance of the economy.

5.4 Recommendations

From the outcome of the research it is evident that the variables under study and their influence on the capital market development is significant. Implying that they are key in the survival of the capital markets and their development. The government need to consider the policies that directly affect the capital market development since it largely affect the economic performance. Investors need to be oriented into the impact of 91 day Treasury bill rate, exchange rate, inflation rate and interest rates on capital market development in order to make more informed decision while investing. The government also ought to control inflation rate by use of necessary monetary and fiscal policies in order to preserve market capitalisation rate.

The study recommends that more policy documents be drafted in regard to the control of the variables that have positive impact in the capital market development. The government should be guided by these findings into making reasonable policy guidance that will make the capital market vibrant.

5.5. Limitation of Study

The choice of the variables was limited, this is due to the fact that the research was interested in specific macroeconomic variables, meaning that the result of the research may not conclusively prove their influence on the capital market development. The study

also used secondary sources of data which impacted study effectiveness and was not able to capture the qualitative aspect of capital market development which are also considered significant for example openness in the capital markets and transparency.

5.6 Suggestions for Further Research

Research can be done to expound on the extent of impact of such variables in the economic vibrancy of capital market with the same scope of measure.

The study examined the effect of other related variables on capital market development in the Nairobi Stock Exchange, from the findings the study can recommend that a reasearch be conducted that can include all the macroeconomic factors and test their influence on the capital market development. It will also be of importance if a study is carried out that incorporates the qualitative aspects that nfluence the capital market development.

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Appendix 1: Data Collection Sheet

Period	Average Market Capitalisation	Average 91-day Treasury bill rate	Average Inflation rate	Average Interest rates	Average Exchange Rate(Libor rate)
1/01/2015	32.61	14.61	6.29	16.82	11.5
2/02/2015	32.54	21.65	6.31	16.58	11.5
3/03/2015	32.33	12.34	6.42	17.16	10.6
4/15/2015	32.09	9.81	6.58	18.3	9.23
5/15/2015	31.97	11.36	6.77	18	8.85
6/15/2015	31.51	10.63	6.87	17.91	9.68
7/15/2015	29.32	8.72	6.88	17.87	4.31
8/15/2015	28.98	8.92	6.72	18.04	5.23
9/15/2015	28.21	8.15	6.59	18.22	6
10/15/2015	27.51	7.25	6.46	18.18	10.04
11/15/2015	27.56	6.16	6.44	18.1	9.76
12/15/2015	27.87	8.48	6.47	17.66	7.24
1/16/2016	28.97	8.06	6.5	13.86	7.01
2/16/2016	28.67	7.76	6.48	13.73	7.12
3/16/2016	28.57	8.22	6.43	13.67	7.05
4/16/2016	28.61	8.44	6.3	13.66	8.78
5/16/2016	29.11	8.58	6.26	13.66	9.95
6/16/2016	30.01	8.64	6.43	13.69	9.88
7/16/2016	30.21	8.69	6.76	13.61	7.23
8/16/2016	30.55	8.77	7.2	13.61	5.32
9/16/2016	30.79	8.73	7.84	13.71	5.29
10/16/2016	30.96	8.42	8.13	13.66	4.13
11/16/2016	30.57	8.22	8.21	13.7	8.29
12/16/2016	29.98	8.17	8.36	13.65	8.9
1/17/2017	28.97	8.13	8.4	13.69	7.23
2/17/2017	29.65	8.09	8.33	13.71	7.9
3/17/2017	27.56	8.01	8.15	13.68	9.21
4/17/2017	26.54	8.01	7.98	13.64	7.75
5/17/2017	27.98	8.04	7.79	13.65	8.75
6/17/2017	25.87	8.03	7.4	13.68	7.63
7/17/2017	24.87	8.02	6.89	13.49	6.98
8/17/2017	24.58	8	6.24	13.24	6.75
9/17/2017	23.98	7.96	5.61	13.25	7.44
10/17/2017	23.61	7.87	5.2	13.22	6.16

11/17/2017	22.87	7.69	4.95	13.1	6.56
12/17/2017	23.98	7.64	4.63	12.78	8.01
1/18/2018	24.58	7.64	4.53	12.66	4.77
2/18/2018	24.98	7.56	4.53	12.61	4.7
3/18/2018	26.79	7.36	4.59	12.55	7.1
4/18/2018	28.87	7.34	4.69	12.51	7.72
5/18/2018	28.97	7.19	4.68	12.5	3.7
6/18/2018	29.31	7.02	4.65	12.47	3.2
7/18/2018	29.54	7.08	4.67	12.51	3.5
8/18/2018	29.87	7.41	4.91	12.5	3
9/18/2018	29.54	7.17	5.04	12.47	3.57
10/18/2018	31.52	6.9	5.16	12.47	4.229
11/18/2018	31.21	7.1	5.32	12.45	4.31
12/18/2018	30.98	7.2	5.4	12.52	4.56

Appendix 2: Firms Listed at Nairobi Securities Exchange.

1.	AGRICULTURAL	28.	Scangroup Ltd
2.	Eaagads Ltd	29.	Uchumi Supermarket Ltd
3.	Kapchorua Tea Co. Ltd	30.	Longhorn Publishers Ltd
4.	Williamson Tea Kenya	31.	Deacons (East Africa)
5.	Sasini Ltd	32.	Nairobi Business Ventures Ltd
6.	Rea Vipingo Plantations Ltd		CONSTRUCTION AND ALLIED
7.	Limuru Tea Co. Ltd	33.	Athi River Mining
8.	Kakuzi	34.	Bamburi Cement Ltd
	AUTOMOBILES AND ACCESSORIES	35.	Crown Paints Kenya PLC.
9.	Car and General (K) Ltd	36.	E.A.Cables Ltd
	BANKING	37.	E.A.Portland Cement Ltd
10.	Barclays Bank Ltd		ENERGY AND PETROLEUM
11.	Stanbic Holdings Plc.	38.	Total Kenya Ltd
12.	I&M Holdings Ltd	39.	KenGen Ltd
13.	Diamond Trust Bank Kenya Ltd	40.	Kenya Power & Lighting Co Ltd
14.	HF Group Ltd Ord	41.	Umeme Ltd
15.	KCB Group Ltd		INSURANCE
16.	National Bank of Kenya Ltd	42.	Jubilee Holdings Ltd
17.	NIC Group PLC	43.	Sanlam Kenya PLC
18.	Standard Chartered Bank Ltd	44.	Kenya Re-Insurance Corporation Ltd
19.	Equity Group Holdings	45.	Liberty Kenya Holdings Ltd
20.	The Co-operative Bank of Kenya Ltd	46.	Britam Holdings Ltd
21.	BK Group PLC	47.	CIC Insurance Group Ltd
	COMMERCIAL AND SERVICES		INVESTMENT
22.	Express Ltd	48.	Olympia Capital Holdings ltd
23.	Sameer Africa PLC	49.	Centum Investment Co Ltd
24.	Kenya Airways Ltd	50.	Trans-Century Ltd
25.	Nation Media Group	51.	Home Afrika Ltd
26.	Standard Group Ltd	52.	Kurwitu Ventures

27.	TPS Eastern Africa (Serena) Ltd		
	INVESTMENT SERVICES	60.	Eveready East Africa Ltd
53.	Nairobi Securities Exchange Ltd	61.	Kenya Orchards Ltd
	MANUFACTURING AND ALLIED	62.	Flame Tree Group Holdings Ltd
54.	B.O.C Kenya Ltd		TELECOMMUNICATION AND TECHNOLOGY
55.	British American Tobacco Kenya Ltd	63.	Safaricom PLC
56.	Carbacid Investments Ltd		REAL ESTATE INVESTMENT TRUST
57.	East African Breweries Ltd	64.	Stanlib Fahari I-REIT
58.	Mumias Sugar Co. Ltd		EXCHANGE TRADED FUND
59.	Unga Group Ltd	65.	New Gold Issuer (RP) Ltd