EFFECT OF GROSS DOMESTIC PRODUCT ON FINANCIAL PERFORMANCE OF COLLECTIVE INVESTMENT SCHEMES IN KENYA

BY

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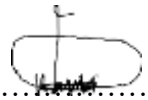
D63/19197/2019

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF MASTER OF SCIENCE IN FINANCE DEGREE, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

2020

DECLARATION

I declare that this research project is my original work and has never been submitted to any other institution for any academic purposes.

Sign……  …… **Date**…30 November, 2020……

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This research project has been submitted for examination purposes with my approval as the university supervisor

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ACKNOWLEDGEMENT

I am grateful to God Almighty for the gift of life and the strength and wisdom granted upon me. Without his divine support, nothing would have been possible. His love and guidance cannot be taken for granted.

My gratitude goes to my lecturer and supervisor Dr. Winnie Nyamute for her guidance and encouragement throughout my research project. This research was conducted during extra-ordinary times when even physical meeting was not possible given the challenges posed by Corona Virus (Covid-19). This did not stop her from offering her wise counsel. My God bless you.

I am further indebted to my friends and family for their invaluable support through the active discussions on my title and the body of this study.

DEDICATION

I dedicate this thesis to my loving mother, Mrs. Roseline Aketch Nyangor. Even though she did not have the opportunity to achieve the greater academic heights herself, she ensured all her children not only get educated but also attain best grades while at it. It is her encouragement, commitment and determination that propelled me to this level.

I also dedicate the thesis to my supervisor for utmost support and guidance throughout the process. Thanks a lot for the patience you demonstrated to enable me write this thesis.

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LISTS OF ABBREVIATIONS

ADF - Augmented Dickey Fuller Test

ANOVA - Analysis of Variance

CBK - Central Bank of Kenya

CIS - Collective Investment Schemes

CMA - Capital Markets Authority

CPI - Consumer Price Index

EVA - Economic Value Added

FP - Financial Performance

GDP - Gross Domestic Product

GNP - Gross National Product

ROA - Return on Assets

ROE - Return on Equity

USA - United States of America

VIF - Variance Inflation Factors

ABSTRACT

Collective investment schemes are pools of investments which bank their relevance on management ability to cause investments to be done through them. The main motivation for investment is to increase wealth and therefore fund managers are gauged on their ability to add value to the assets under their stewardship. Like any other investment project, they are affected by conditions within and outside themselves. GDP, which is a macroeconomic factor is one of the key conditions expected to impact of CIS performance. Macroeconomic factors are those factors which can potentially affect the CIS performance but are external to the entities. With their nature, macroeconomic factors are expected to have a varying effect on financial performance and growth of CIS depending on their favorability. This study's objective was therefore to determine the impact of gross domestic product on the financial performance of collective investment schemes in Kenya. The research was based on the financial intermediation theory, agency cost theory, modern portfolio theory and the financial inclusion and development theories. The study adopted a casual research design and the population comprised of the nineteen licensed CIS in Kenya. The study used quarterly secondary data which was obtained from the Capital Market Authority, Central Bank of Kenya and the Kenya National Bureau of Statistics for a period of 10 years between 2010 and 2019. The collected data was first summarized in an excel sheet and descriptive statistics used to summarize it. A regression technique was then applied using STATA software version 14.2 and results interpreted in line with the research objectives. The analysis was done at four levels based on specific unit trusts which entail Money Market Funds, Balanced Funds, and Equity Funds and Fixed income Funds. The results revealed GDP had a positive and significant relationship with money market funds returns while stock returns had a positive and insignificant relationship with the money market fund returns whereas interest rates had a positive and significant relationship with money market fund returns. The study also found that GDP and interest rates had a positive and relationship with the balanced funds returns respectively while stock returns had a positive and significant relationship with the balanced funds. Further, the study found that GDP and interest rates had a positive and insignificant relationship with the equity funds returns respectively while stock returns had a positive and significant relationship with the equity funds returns. Finally, the study documented GDP, stock returns and interest rates had a negative and insignificant relationships with fixed income funds yields respectively. The study concluded that GDP and interest rates significantly influences the performance of money market funds while stock market performance significantly influences the performance of balanced and equity funds respectively.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Collective investment schemes are pools of investments which bank their relevance on management ability to cause investments to be done through them. With an increase in the amount of assets under their management as per Capital Markets Authority (2019), then good financial management and growth is more than expected not only by the investors themselves but by the general economy. The main motivation for investment is to increase wealth and therefore fund managers are gauged on their ability to add value to the assets under their stewardship. Like any other investment project, they are affected by conditions within and outside themselves. GDP, which is a macroeconomic factor is one of the key conditions expected to impact of CIS performance. Macroeconomic factors are those factors which can potentially affect the CIS performance but are external to the entities Adidu & Olannye (2006). With their nature (not able to be controlled by CIS management), macroeconomic factors are expected to have a varying effect on financial performance and growth of CIS depending on their favorability.

Several theories have been developed to support the existence and performance of CIS. Among them is the financial intermediation theory of (Allen & Santomero (1997). This theory advocates for financial intermediation to prevent investors from losing in transactions with financial instruments. Another theory is the agency cost theory of Ross (1972) which supports the incurrence of management fees through CIS to prevent losing and benefit the investor as the principal. Other theories are modern portfolio theory and financial inclusion and development theory. In CIS, investors would incur agency costs to ensure that their investments gain more return than they would have brought by managing them themselves.

This is usually achieved by developing a portfolio which is advised by numerous continuous researches and diversification by the unit managers. Part of their research is on the GDP which affect the assets they manage. It is therefore expected that the managers use their researches and skills to bring about growth and return to CIS based on taking advantage of opportunities presented and avoiding risks early brought about by the GDP contributing factors.

Kenya has faced very diverse economic conditions in the recent past. Part of it is change of factors like interest rates which were capped, political temperatures and also the Coronavirus epidemic. All these factors are reflected in the GDP of a country. With above average expertise, unit managers are expected to have taken advantage and either bought or sold and as a result are not expected to have a negative return.

1.1.1 Gross Domestic Product

Broadstock, Shu and Xu (2011) observed that GDP is a reflection of the macroeconomic conditions in an economy. Macroeconomic factors were described by Adidu and Olannye (2006) as factors existing outside a firm but with an ability to affect the performance of the firm. Such factors are not within the control of the management of the firm. According to Broadstock, Shu and Xu (2011), such factors include unemployment levels, GDP, CPI, interest rates and corporate tax rates among others. The factors can affect the firm either positively or negatively Egbunike & Okerekeoti, (2018). Based on these observations, it then becomes very necessary that business management have an idea of the possible macroeconomic factors in their environment and determine how they would influence their businesses. If they can affect negatively through posing business threats, then the management can take measures to counter the effects, otherwise they plan well to utilize

opportunities if they are to be impacted positively.

Aguilar (1967) observed that these conditions can be in three states depending on their frequency of changes. These are stable, unstable and dynamic, dynamic state indicating a very frequent and continuous change. Since there are different frequencies of change in the factors, predicting them becomes difficult at some states and this makes it very likely that businesses may be caught unaware and thus fail to utilize opportunities presented or are affected by threats not planned for. A study by Kaldiyarov et al. (2018) established that policies made by authorities (macroeconomic factors) were very promising for collective investment schemes while Kimani and Kisaka (2016) determined that gender, age, income levels were some of the factors that affected investments in investment schemes. Since it has been established that they actually affect, then it becomes important that a study is done to establish how the macroeconomic factors affect financial performance and growth of CIS in Kenya. This study is backed up by the fact that these factors are different in different countries and also change from time to time. These changes makes conclusions reached earlier or in a different economy less applicable and may mislead decision making.

Firms can adopt different means to measure GDP. While specific factors can be measured separately, all macroeconomic factors reflect in a country's consumer price index, gross domestic product, and GNP and inflation levels among other factors. In this study, nominal value of the GDP will be used as it is a good reflection of most of the macroeconomic variables in an economy. The choice is also advised by the observations by Dynan and Sheiner (2018) that GDP is a good measure of economic wellbeing in a country.

1.1.2 Financial Performance

As defined by Harelimana (2017), financial performance is an indicator of a firm's policies

and decisions in the better understood monetary terms. This view was supported by Ng'ang'a (2017) who also argued that, the FP measure helps in gauging the attainment of company objectives. A firm with a higher financial performance is usually better off compared to a firm with a lower one. FP can be looked at as returns to investors as a reward for their investments in a CIS.

Mutua (2019) posed that FP is very crucial as it helps in relaying information to various interested parties. Investors are able to know how better off or worse off they become and gauge their managers' ability. Management on the other hand use financial performance and growth to determine effectiveness of their decisions and controls they implement. This facts show that financial performance is very crucial to all stakeholders in any firm and therefore they have to be good to relay good information.

Different researchers and scholars have advocated for different measures for financial performance and growth. Tauseef, Lohano and Khan (2015) advocated for financial ratios. Their argument was that they simplify information for better understanding and also help management in identifying areas needing improvement. The identification is because they indicate the performance in comparison to previous years. Other measures advocated are the EVA, profit margins, growth in sales, ROA and ROE. As advised by Zenios et al (1999) this study will measure financial performance using the average returns by collective investment schemes.

1.1.3 Gross Domestic Product and Financial Performance

GDP is very diverse and change from economy to economy, and also from year to year in an economy. As such, it shows the influences on performance of CIS is very diverse. This shows that results in one research may not apply directly without adjustments. Considering the

investments done in CIS, their performance is very crucial to the economy as a whole. Although modern portfolio theory and financial intermediation theory support use of CIS in investment, some researchers have indicated that this is not a guarantee of above average returns. Factors like inflation rates, interest rates and income levels have been shown to affect performance and growth of CIS. Although they are very informing, they have been researched individually and this calls for a better analysis of the combined effect of all these factors using a single measure. This kind of an analysis will help reduce the correlation between some of these factors and measure the overall effect as the factors are much related and may sound like evaluating a fraction of what can influence FP and growth of CIS.

Apart from these factors, scholars have identified other variables which can influence financial performance of CIS. These variables include firm liquidity as established by Kimeu (2015) and Akenga (2017), levels of exchange rates established by Lee and Kweh (2017) and also the NSE performance (Kyalo, 2017). These factors will be analyzed together with the GDP to have a better understanding of many factors which can influence financial performance and growth of CIS. This is with the aim of exploring the matter more comprehensively.

1.1.4 Collective Investment Schemes

As described by Capital Market Authority (n.d), a collective investment scheme is a pool of investments, managed by a professional manager on behalf of the investors. In Kenya, there are three main types of collective investment schemes. They are the unit trusts, employee share option schemes and the mutual funds. Harman, (1987) defines unit trust as a form of investment alternative that seek to minimize risk by formation of an investment vehicle that pools monetary resources from individuals and other entities and is managed by a fund

manager. Their aim is to provide reasonable return while minimizing risk through diversification and also minimize the cost of investment per member. The investment manager undertakes the investment of members' funds in selected portfolio of assets such as government debts, corporate debts, shares, real estate, and other authorized instruments with the objective of meeting the goals of the investors.

In the period between 2001 to 2020, the number of approved unit trust funds have grown from zero in 2001 to 19 in 2019, with the asset under management at Kshs 71.4 billion (Capital Markets Authority, 2019). This proves popularity of the collective investment schemes in Kenya. Both small and large investors are opting for unit trusts as investment vehicles of choice. The preference can is because they provide flexibility that is typically not available in alternative investment options while still offering competitive returns at low risks. Investors use unit trusts for liquidity management, savings for emergencies, and opportunities for diversification with minimal cost of investment.

Based on this growing popularity of CIS, amount of assets under their management and the agency fact of managing on behalf of investors, financial performance and growth of these CIS is an undisputed fact. It therefore becomes very necessary for fund managers to ensure good FP and growth to be executing their agency role well. This is only possible if they understand the factors that can affect the performance of the funds under their management. Among other factors, GDP is expected to affect the CIS either positively or negatively. This research will determine the impact of GDP on the performance of these important investment vehicles in the Kenyan context. The results of this study will advise fund managers appropriately on these external factors on the basis of how they expect the funds they manage to be impacted.

1.2 Research Problem

It is the hope of every business to make good advancements in financial performance and also grow. This has however not been the case as evidenced by corporate failures in the recent past. Falling of institutions is an indicator of harshness of some conditions. Most importantly, the GDP underlying factors. Examples of the factors are like interest rates in the country and the Coronavirus epidemic which are factors beyond the control of any firm. Representation in investing decisions has been emphasized by the financial intermediation theory but what worries is why an advice to sell off investments in the period preceding Coronavirus epidemic was not given if management of the intermediaries had special skills. This indicates a lacking and thereby a support to earlier propositions that intermediaries, including CIS managers, increase cost for no reason as investors would still have purchased the same stocks as the managers Kamwaro, (2013).

Another theory, which could have been used to advice on investments include the modern portfolio theory which was dismissed by Kamwaro, (2013) on the basis that risk averse individuals can also form a return yielding portfolio. This deficiency in theories is part of the basis of this research to ensure complimentary knowledge to facilitate CIS growth and good financial performance.

The factors which contribute to GDP in Kenya have been somehow unfavorable. It ranged from interest rate capping then its revision in the year 2019, highly charged political campaigns in 2013 and 2017, changes in the fiscal environment as evidenced with changes in taxation laws and currently the Coronavirus epidemic among other factors.

Studies done both internationally and locally have indicated varying factors affecting performance of CIS. Whereas Trifonoya (2014), indicated economic unawareness of

communities as having a negative impact on operations of CIS, Sergeeya (2009) determined that in US monetary and fiscal policies were impacting positively on CIS performance. Sergeeya observations were supported by those of Zetzsche (2018) in European states. This diversity in observations are creating a gap which needs to be addressed.

Local studies done have added to the diversity. Kimani and Kasika (2016) established that income levels, age, gender and education levels as the crucial factors affecting performance of CIS while Rhoda (2016) established that it was interest rates, inflation levels and exchange rates which affected performance of CIS. With this diversity, CIS managers are exposed due to lack of agreement in the empirical studies done. They are then prone to making wrong decisions. CIS are the latest investments and their operations are yet to be studies in depth. They are also structured and managed to offer above average returns attracting attention. This study will focus on the GDP and its contributing factors as they are the most crucial. This is because they are external to the funds and have little control over them and therefore pose the most risk. By understanding their effect on FP and growth, CIS managers will be able to plan accordingly. This research therefore seeks to answer the question; what is the impact of GDP on the financial performance and growth of collective investment schemes?

1.3 Research Objective

The objective of this study was to determine the impact of gross domestic product on the financial performance of collective investment schemes in Kenya.

1.4 Value of the Study

This study will be significant to several stakeholders. First, it will be useful in practice to fund managers, portfolio managers and investors. Fund and portfolio managers will better understand how to manage their funds and portfolios better in light of the effect of the GDP

on their firms. The result of the study is expected to help portfolio managers improve their asset management skills to maximize returns for their investors regardless of the economic condition in the country. This study will also offer great benefits to current and prospective unit trust investors and the general public at large. It will help inform their choices of where to invest at how to apportion their assets in different investment options in face of different prevailing economic conditions.

The third beneficiary of this study will be the government policy making through its different regulatory agencies. These agencies include the Capital Markets Authority of Kenya, CBK, and the Ministry of Finance among other government bodies tasked with the formulation of economic policies to steer the country to prosperity and also regulate and oversight the financial markets in Kenya. These bodies will make better policies, advised by the actual effect of GDP on collective investments in the country which have been determined through a research.

Lastly, this study will be of great benefit to future researchers and academicians who invest their time and other resources to study and help develop the financial market and the unit trust industry in particular. By adding to the existing body of knowledge, the research results will help in coverage of all important aspects of investments in the country.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this section, the study shall focus on the studies which have been so far made in regard to the GDP impact on the financial performance of CIS in Kenya. The chapter shall look into theoretical review focusing on the scholarly theories in favors of any of the study variables, other determinants of performance of CIS, an empirical review concentrating on past researches done, conceptual framework and summary of the literature review.

2.2 Theoretical Literature Review

Under this section the study shall consider some literature which has focused on some of the theories under area of study in existence. A number of theories have been considered to help the researcher achieve the research objectives. The research shall revisit financial intermediation theory, agency cost theory, modern portfolio theory and the financial inclusion and development theory due to their ability to support one of the variables of the study or interlinking thevariables.

2.2.1 Financial Intermediation Theory

The financial intermediation theory was advanced by Allen and Santomero (1997) in the attempt to explain the nature of the intermediaries in the security markets. According to Kamwaro (2013), the existence of intermediaries has significantly increased in the markets which offer intermediation services to the different market players. Even though the study noted that intermediaries could be responsible to an increase in the cost of transaction as they engage in offering the secondary financial instruments, the buyers could have still purchased the same instruments at primary level in their absence Kamwaro (2013). In the study of Molnar (2018), he established that in a normal market the existence of risk and imperfect

information gives a great challenge to the lenders as well as the borrowers. In the case in order to mitigate the possibility of losing in transacting in the financial instruments, it becomes quite inevitable to engage the intermediation for the market transactions.

As the economy continues to grow, so does the need to finance the operations of the businesses which call for better structures to ensure proper coordination of these activities. The lenders have excess finances which they will have to invest for wealth maximization while the borrowers will seek an avenue to obtain the finances and utilize them for making their businesses to grow Kamwaro (2013). In that case, the cost of intermediation shall only be justified in a market failure based on the fact if the concept of perfect markets in the economy was something that holds the forces of demand and supply could meet the need. However according to Bethune, Sultanum and Trachter (2019) the intermediaries have control of better information and screening expertise which justify their existence and need in the markets. Intermediaries cushion the risk that is faced of either overvaluation or undervaluation of the financial assets, and again provide the crucial linkage between the lenders and borrowers to transact at ease within the market as argued by (Bethune, Sultanum and Trachter, 2019).

However some other players in the economics field have viewed that the concept of perfect competitive market is still in existence and have been on the opinion that the intermediaries have no role in the markets criticizing the theory of financial intermediaries as it has been proposed Arrow DebrueMckenzie and Marshallian as quoted by (Novshek & Sonnenschein, 1987). However, the concept of a perfect competition has been most a theoretical concept and in the reality it is hard to achieve. Therefore, the concept of theory of financial intermediaries becomes quite relevant in the real economic situation where imperfect markets exist and mediation becomes necessary for most activities to run smoothly. The theory has

been adopted for the current study as it shows a general overview of the economic situation.

2.2.2 Agency Cost Theory

The theory of agency cost can trace its origin from prominent economist Ross (1972) as indicated by Mitnick (2006). According to the theory, the problem starts with the existence of agency relationship which exists in most of the business operation. It is noted that most of the businesses operate on the principal-agent relationship with the investors seen as the principals and managers being the agents (Mitnick, 2006). The real problem becomes that the two parties have contradicting objective with the principal aiming at maximizing their wealth in investment while the agents need to get the best pay at the expense of owner's wealth. In the attempt to resolve these contradicting objectives which are simultaneous in nature, the principal should be willing to pay some amount to the agents as a motivation which brings the concept of agency cost theory (Chechet & Olayiwola, 2014).

In order to maximize the wealth of the owners of the business, the owners should be willing to offer some motivating incentive to the managers so as to offers the best to the firm. While different techniques have been adopted to determine the level of cost to be acceptable as agency, the most common models are the ones for performance based bonus schemes as per the study of (Tritt, 2010). In such a scenario, the efforts of the managers to achieve the best are initiated by the push for better pay they have. Then the agency problem gets its solution at this point but a new problem becomes the amount of the agency cost that shall be offered to the manager to motivate them mostly in form of percentage of sales, production or time saved in the production process by the managers as per (Besley & Ghatak, 2014).

According to their research findings, Besley and Ghatak (2014) found that motivation had a direct relationship with the level of performance in the business which has been thought to translate to the growth of business.

However, according to Tritt (2010), as this motivation is done at the expense of the shareholder's wealth maximization objective, then motivation cannot be increased to infinity. Therefore, an equilibrium point need to be assessed to ensure that the marginal level of productivity exceed the marginal cost for motivation. The theory has been assumed for the study due to this fact that the agency cost is not avoidable and it is thought to have a positive influence to performance as per (Besley & Ghatak, 2014).

2.2.3 Modern Portfolio Theory

This theory can be traced to be an improvement of the Markowitz portfolio theory and which was advanced by Markowitz (1952) recognizing the existence of risk in the market and the concept of returns on investments. The theory was based on the fact that in any market, where perfect information is not available, uncertainty will be a common fear to all investors according to (Kamwaro, 2013). In his finding Kamwaro (2013) established that there is still a chance that even the risk averse individuals will still have an opportunity to develop an investment portfolio that can yield some returns to their investments.

The theory of modern portfolio has been prominent due to its ability to establish a model that can measure the risks associated with different investments at the market (Kimeu, 2015). Being presented with all the financial assets available in the market, one should be able to develop a portfolio made of a number of assets that will be in a position to diversify the level of risk associated with the assets while at the same time maximizing on the level of returns from the portfolio. The theory become quite important to the CIS were the manager is

expected to collect the investments of many investors and put them into different investments which will be expected to give a positive return to the investors (Kimeu, 2015).

The managers widely use this concept of the modern portfolio theory to determine the expected returns that the investors need to get at the end of a specified period. From such information the manager will precede a head in deciding a number of investments that they will be making their investments in based on rationale. From these investments, the fund manager decides on the number of shares or bonds in each firm which will give the best contribution towards the returns to the investors as per (Kamwaro, 2013). The theory has been chosen for the current study due to its ability to explain the nature and operation of the collective investment societies which is the context of our current study.

2.2.4 Financial Inclusion and Development Theory

The theory of financial inclusion and development can be dated from 1873 when Bagehot thought of the principles of financial models that can support economic growth. The theory becomes a center player of the current study due to its importance in the three variables of the current study. According to Kimani and Kisaka (2016), in every scenario where industrialization has taken place, the issues of financial system must arise. This is because businesses will be under developed if they could rely more so on the owners of the firms resources for their entire financing (Kimani & Kisaka, 2016).

It has been normal that financial institutions like banks and the collective investment schemes have played a critical responsibility in supporting new business by availing necessary finances for startups and mostly within the upcoming industries. The theory becomes relevant for the current study as it plays a pivotal role of all the variables of the study. The theory has captured the existence and importance of the financial institutions which the CIS play a

critical complementary role in the industry as per (Okoth, 2014). In his study Okoth (2014) established that the availability of finances from the CIS which were becoming more popular in the economy had contributed to the growth and sustainability of other industries in which CIS had invested in as part of the formation of their optimal portfolio.

On the other hand the investors obtained their returns from the portfolio which means there was an expectation improved standards of living. As per Sharma (2014) there is a considerable positive correlation that exists between the concept of financial inclusion and the growth of the economy based on the connection between investors and borrowers which was termed as a symbiotic relationship. Therefore, there is a positive correlation between the existence of CIS and the financial performance which translate to growth as per (Sharma, 2014) and which the current study shall seek to establish if it still remain to

2.3 Determinants of Financial Performance

Under this section the study shall review some other factors which might be thought to have an influence on financial performance of collective investment schemes. The study shall consider the influence of interest rates on the two variables, firm's liquidity and the NSE performance on either growth or financial performance of the collective investment schemes.

2.3.1 Stock Market Returns

The stock market has been an avenue where most of the investors put their wealth to maximize on returns from such investments. According to the study by Kyalo (2017), most of the fund managers are known to construct a portfolio that gives the best returns which comprises a combination of the Security investments and treasury bonds. Therefore, a better performance in the stock markets has been found to have a positive influence on the collective investment funds as they yield better returns which boost performance and hence contribute to

the growth of CIS (Kyalo, 2017). The study established that firms NSE needs to educate the investors on the importance of the different schemes of investments.

As per the study by Jefferis and Smith (2005) the performance of the security markets show general activeness of the economy and translates to general growth of firms inclusive of the collective investment schemes. This study was later supported by the findings of Yousuf and Nilsson (2013) which confirmed that the stock market performance was a mirror of the economy and good performance confirmed the wellness of the entire economy as evidenced in good performance of the individual firms including the collective investment firms. In the current study, the performance of the NSE shall be measured using the share index as was the case in Gul and Javed (2009).

2.3.2 Inflation Rates

According to Gupta and Agrawal (2010), inflation is a measure of the rate at which the prices of food and other commodities increase over a period of time. Their study established that there was a negative relationship between investment and inflation. This was based on the concept of the loss of the purchasing power of the currency which resulted to even negative returns on investments (Gupta and Agrawal, 2010). A study by Coffie (2019) in Ghana economy did establish that inflation rate was among the factors that had affected the growth of the mutual funds within the nation. The study results showed that inflation rate was having a negative influence on the performance and pricing of mutual funds in the short-run but a positive influence on performance in the long-run.

However, a contradicting finding by Okoth (2014) established a positive relationship between the growth of investment fund assets and inflation. This was attributed to the fact that most CIS invest in real estates and which during inflation rate appreciate in value at a very high

rate and hence the growth of the schemes. These study results were in line with the findings in a previous study by Ansong (2013) which had established a positive and significant relationship between inflation and the growth of the mutual funds. In the current study, inflation rate shall be measured using the percentage of change in purchasing power of the Kenyan currency over the 10 year period and seek to establish if the is a relationship with the growth of the collective investment schemes in Kenya.

2.2.3 Interest Rates

Interest rates have been a major and a key determinant in the level of operations on the investment industry. According to Okoth (2014) who did investigate on factors affecting the growth of collective investment schemes in Kenya established that interest rates and bonds had a positive impact on the growth of collective investment schemes within the state. This can be attributed to the levels of returns investment managers get from the assets they invest in which under high interest rate tend to give a higher return (Okoth, 2014). According to the study by Mbau (2017), the interest rates in Kenya had been capped from the year 2016 which was seen to have a negative effect on the performance of financial institutions but a positive impact on the other sectors of the economy. Mbau (2017) however, established that the banks and investment schemes had an option of diversifying their portfolio by concentrating on other investments like government bonds and the foreign investment ventures.

According to Mutua (2019), the lifting of the interest rates cap in Kenya was expected to give a positive effect on the performance of the financial institutions. This could be associated with the increased borrowing by the private sector as financial institutions were ready to offer more loans due to the improved returns. This in return will give higher returns to the investors in the market including the fund managers and offer an opportunity for more diversification

of the collective investment funds resulting to more growth (Mutua, 2019). With the interest rates being a key determinant of the portfolio for financial investors and fund managers, it becomes of critical interest in the current study where the growth of collective investment shall be studied before and during the 2016 interest capping. The interest rates shall be measured in the current study using the CBK recommended lending rate for the financial institutions as it is more reliable.

2.3.4 Gross Domestic Product

Any firm which gets into business operates within an economic system must be aware of the existing economic condition within their industry with GDP being a key indicator of the external forces affecting businesses. With the study by Adidu and Olannye (2006) describing the macroeconomic factors as factors existing outside a firm but with an ability to affect the performance of the firm. The wellness of the entire economy as may be indicated by the country's GDP aggregates the individual performance of firms within the economy. The external factors can affect the firm either positively or negatively (Egbunike & Okerekeoti, 2018) with better performance in the GDP having a positive impact on individual firms, at times balance between the industries does not exist and some industries may be favored at the expense of others by policy makers. A successful firm will minimize on the threats by planning in advance and maximize on the opportunities by being swift in their actions hence getting good performance and growth.

2.4 Empirical Review

A number of studies have been so far conducted in the attempt to establish the impact of GDP as a macroeconomic factor on the financial performance and growth of collective investment firms both locally and in the globe. A study made in the context of Bulgaria by Trifonova

(2014) which sought to establish the growth of collective investments in Bulgaria using a descriptive study, established that among the key factors that have affected the financial performance in the security market and for the CIS was the lack of information and the tendency of people to hold money in other investments without considering these kind of investments. In general the study viewed that the macroeconomic role of creating awareness to the public of how the security markets and CIS operates within the state had failed (Trifonova, 2014). However, the study did not give fair information of how the current rate of usage of such investments, to establish if the authorities had given a consideration calling for more detailed study to establish such trends.

Another study in the context of USA by Sergeeva (2009) which sought to establish how regulations had influenced the financial performance of the financial and non-financial investment firms in the US, Europe and Canada established that there existed too many options for investors in the market. The major concept focused in the study was the diversification of risk that gave the investors an option to store their wealth in form of a portfolio with different CIS firms. The fiscal and monetary policies of these nations were found to be made in favor of these establishments providing healthy environment for their good performance and growth (Sergeeva, 2009). However, the fiscal and monetary policies of those nations compared to Kenya seem to be totally different hence calling for the study in Kenya to establish the extent of support offered to CIS in the state.

A study by Kaldiyarov et al. (2018) in the context of Russia which employed a comparative analysis approach established that in the recent past, the policies made in the state were promising to the collective investment institutions. While most of these institutions were found to have made their concentration on real estate investment which were in a kind considered a more secure and successful investment, their success was quite commendable

(Kaldiyarov et al., 2018). However, the type of investment which was considered in the study tends to be limited in the context of the current study as there are many competing firms in the real estate business in Kenya calling for an in depth study in the situation of diverse investment requirement.

According to Zetzsche (2018), the existence of a difference between the taxation law and financial law governing the collective investments schemes and non-collective investment scheme has always been an area of concern within the economy. While the collective investment schemes are given an incentive on level of taxation, some of the stakeholders in the non-collective investment scheme view it unfair as the financial performance of the two sectors tend to be the same in the context of European market. While this is seen to be a fiscal policy in macroeconomic giving a favor for better performance of the CIS, the study still called for an investigation of why the member of public may be reluctant to join the CIS if the incentive exist necessitating the current study.

Focusing on the regional studies, a study in the context of South Africa by Price (2018) established that the collective investment schemes provide a developing vehicle especially for the risk averse investors to still secure a viable investment. Where pooling of investments from different investors cushions the risk of investment, returns were thought to be maximized in this firms based on the expertise of management. The study crowned it all by assuming both economic policies and individual investor's perception of risk had contributed to the good performance and growth of collective investment schemes (Price, 2018). However, the study did not boil down to the specific economic factors that might have influenced the growth of this CIS which the current study shall seek to establish.

Another study conducted in the context of Nigeria by Orok, Emori and Ikoh (2019) adopting an OLS multiple regression approach sought to establish if there was any correlation between the development of the capital markets and the existence of the CIS in the capital markets. The study established a strong correlation of the collective investment schemes and the growth of the financial markets due to the availability of trading fueled by the CIS. The study concluded that CIS plays a critical role in the development of the security market in Nigeria giving them even a better hand to be compared with the Global security markets. However, the study concentrated on the results of the CIS to the capital market rather than the growth existing in the CIS which shall be the key focus in the current study.

Coming into the local studies, a study by Kimani and Kisaka (2016) which used a descriptive study approach on the impact of CIS on financial inclusion in Kenya established that from a general point, there was a limitation of the access of the collective investment schemes within the state. The study concluded that the key factors that to some extend influence the operation of the CIS were the gender of investor, their age, level of income and their education which summed up to the entire structure, expectations, selection of managers and operations of the manager funds which could in return influence the financial performance and hence the growth of CIS. The study however did not establish what factors might have contributed to low access of the collective investment which influences the size of investment and hence the extent of growth.

Given the important role the GDP plays in the returns made by unit trusts, ignoring the various variables when analyzing the performance of unit trusts would lead to misleading conclusion. According to Dawe (2016), his study that used a descriptive statistics approach established that there were a number of factors which had been perceived to influence the performance of CIS firms in Kenya. The key factors noted to influence CIS performance according to

Dawe (2016) included the risk of the investment, the age, online trading, experience and more importantly involvement of foreign investments.

The study on performance of equity funds in Kenya by Rhoda (2016) which adopted a descriptive study design established that among the major factors that influenced the performance of CIS included interest rate which exhibited positive relationship, exchange rates which had a negative relationship and the inflation rate which showed a negative correlation. On examination of market readiness for indexed funds in Kenya,(Akama & Jagongo, 2013) come out with inconclusive findings as to whether increased efficiency in the Nairobi Securities Exchange made it difficult for fund managers to outperform stock indexes. All these gaps point out to the need of further study of the performance of unit trusts in Kenya in relation to the macroeconomic variables.

2.5 Conceptual Framework

This study's conceptual framework comprises of gross domestic product as the independent variable measured using the natural log of real GDP while financial performance measured using the average returns on CIS investments was the dependent variable. The study also incorporated stock market returns, inflation and interest rates as control variables. Figure 2.1 shows the conceptual framework.

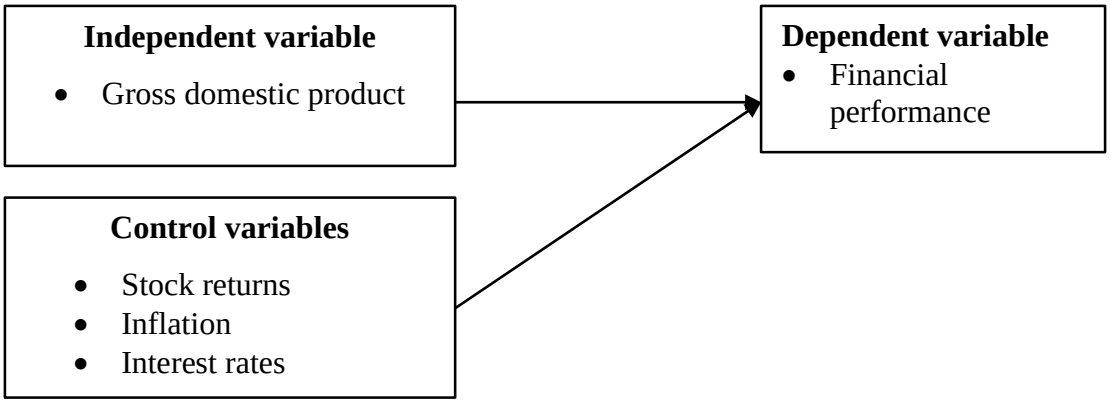


Figure 2.1: Conceptual Framework

Source: Researcher (2020)

2.6 Summary of Literature Review

A number of studies have so far been done in respect of the GDP as a macroeconomic factor influencing the performance of the CIS. Trifonoya (2014) established that there was deficiency of economic awareness among the community of Bulgaria which had a negative influence on the operation of collective investment schemes. The however did not provide fair information on the extent of the usage of CIS and the level of support by government. In the US, Sergeeva (2009) established that the fiscal and monetary policies were in favor of the CIS giving them an opportunity to grow a finding which was later supported by the findings of Zetzsche (2018) in the context of European states policies. However, the context of USA and Europe which are developed countries may be totally different from the Kenyan context in the current study. In the context of Russia, it was established that greater favors on the CIS come from the investment options with the real estate business being dominant (Kaldiyarov et al., 2018). The context of Kenyan competitive market in real estate may be differing from Russia calling for an in-depth study in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this section, the research methodology was outlined. The researcher described the procedures and the methodologies that he undertook to conduct the study in order to arrive at the conclusions relating to the effects of the gross domestic product on the performance and of the collective investment schemes in Kenya. The chapter covered the research design, the population of the study, the data collection techniques and processes, the data analysis and the model specification. In addition, the chapter also covered the tests to be applied to confirm data validity and reliability as well as the significance test to be used in the study.

3.2 Research Design

Leavy (2017) explained a research design as a structure and plan of investigations geared towards answering the research questions. He emphasized on methodological transparency as it tells future researchers on the process by which conclusions have been arrived at by a researcher. A quantitative research design and more specifically the casual research design. Casual research design is concerned with the cause-effect-effect relationship between the given variables. Given that the objective of the study was to determine the effect of the GDP on the growth and performance of the CIS in Kenya, this design was deemed appropriate. This research design involves collection, analysis, interpretation of the study results and writing them down (Creswell, 2002). This method was preferred due to its confirmatory and deductively in nature as observed by Ochieng (2009) over the other designs.

3.3 Population

Thepopulation for this study was all collective investment schemes licensed by the CMA in Kenya. There are only nineteen licensed CIS in Kenya and their data is available from the CMA website. According to Mutua (2019), it is advisable to use census survey when the population is small and data is readily available. Based on this advice, no sampling was done and so a census survey was adopted. The study was based on the whole of the licensed collective investment schemes.

3.4 Data Collection

The study used data from the published financial information from the nineteen active collective investment schemes in Kenya. The data collected included the CIS quarterly returns (yields). The data on CIS quarterly returns (yields) was then used to measure the performance of the collective investment schemes and covered a period of 10 years between 2010 and 2019. The collective investment scheme industry is further subdivided into specific unit trusts such as Money Market Funds, Balanced Funds, and Equity Funds and Fixed income Funds, the data collection followed the same categorization. For a given year, the yield by fund in the industry was obtained by calculating the average percentage yield of all the individual funds that were in existence in that particular quarter. For instance, the industry balanced fund yield in a given quarter is obtained by averaging the yield of individual balanced funds that were in existence during the quarter. The same applied for money market, fixed income and equity fund.

In order to obtain the CIS quarterly returns (yields), the percentage change measured by dividing the change with the opening net asset value. The change was obtained by subtracting the opening net asset value from the closing net asset value at the end of the quarter.

The data on inflation (CPI) and the Real GDP was obtained from the Kenya National Bureau of Statistics website which is the primary source of this information. The interest rates were measured using the weighted average banking sector lending rate and the data was also obtained from the Central Bank of Kenya website as the primary source. The last set of data is the performance of the listed equities which was measured using the Nairobi All Share Index (NASI) annual return for the period of the study and this was obtained from the Nairobi Securities Exchange website which is the primary source. The study covered the quarterly return and all the data was quarterly covering the ten- year period between 2010 and 2019.

3.5 Diagnostic Tests

These are tests done on secondary data collected to confirm the data validity and boost its reliability. It was observed by (Gomm 2008) that, validity and reliability, together with objectivity are basis on which a research is judged. These tests also help to determine the stability and quality of data obtained (Riege, 2003). Roberts and Priest (2006) cautioned against ignoring these procedures regardless of the truth in statements by (Murphy & Dingwall 2003) that validity and reliability checks do not guarantee production of trustworthy results. The following tests were done to confirm the validity of data.

3.5.1 Test for Stationarity

Stationarity test was carried out on the collected data to determine if the means and variances of the different variables remain the same over time. Using variables without testing for stationarity may make the regression spurious leading to fabricated results (Mushtaq, 2011). This test was done using the ADF test and if correction was needed, it was done using differencing.

3.5.2 Test for Multicollinearity

Multicollinearity is the existence of a relationship between predictor variables (Daoud, 2017). This is an undesirable situation as it inflates coefficients of some variables. The test was carried out using the variance inflation factor. Any variable identified to have a VIF of more than 5 was considered to be much related to other variables in the model and were omitted in the regression.

3.5.3 Test for Normality

Normality means that the distribution of the residuals of the regression follows a normal distribution. Using the relevant data, the researcher used the Shapiro-Wilk test to confirm the normality of the variables. The test should not be significant for the assumption of normality to hold.

3.5.4 Test for Heteroscedasticity

Heteroscedasticity needs to be taken into account for efficient inference in regression models (You & Chen, 2005). The test was carried out with the intention of determining the variability in variables by observing the error terms. It was determined by use of Breusch-Pagan test and interpretation will be done at 95% confidence interval. Existence of heteroscedasticity was corrected by use of Robust Standard Errors.

3.5.6 Test for Autocorrelation

This test was done to determine the behaviour of the error term in subsequent years. This test was done by use of the Breusch-Godfrey LM test for autocorrelation. Interpretation was done at 95% confidence interval and if need be, autocorrelation was corrected using Robust Standard Errors.

3.6 Data Analysis

This is the practice of ordering and organizing data with the intention of extracting information from it (Gall, Gall & Borg, 2007). The data was first summarized in an excel sheet and descriptive statistics used to summarize it. A regression technique was then applied using STATA software version 14.2 and results interpreted in line with the research objectives. The analysis was done at four levels based on specific unit trusts which entail Money Market Funds, Balanced Funds, and Equity Funds and Fixed income Funds. First, the analytical analysis were conducted to determine the impact of the GDP on the financial performance of the collective investment schemes in Kenya.

3.6.1 Analytical Research Model

The study adopted a regression model which took the following form

$$Y_{1t} = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \varepsilon$$

Where,

Y_1, Financial Performance in time *t* measured using the quarterly average yields (returns)

$\beta 0$, Regression equation constant

X_{1t}, GDP levels at time *t* measured using the natural log (ln) of quarterly real GDP

X_{2t}, Stock market returns at time *t* measured using quarterly stock returns

X_{3t}, Inflation at time *t* measured using quarterly consumer price index (CPI)

X_{4t}, Interest rates at time *t* measured using quarterly weighted average lending rates

ε, Probable residual error

$\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, the coefficients of GDP, stock market returns, inflation and interest rates.

3.6.2 Test for Significance

Significance in the study will be tested by use of a combination of ANOVA and p-values. Interpretation of the results in this study will be done at 95% confidence level. The value of R will be used to determine the correlation in the predictors and the dependent variable while R^2 will determine how close the data is, to the best line of fit. It will therefore highlight the efficiency of the study to predict the causes of variation in collective investment schemes' financial performance and growth.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

4.1 Introduction

This chapter presents the study results based on the analysed data. The chapter entails the descriptive statistics, the diagnostic test results, correlation results, regression findings and finally an interpretation of the study findings.

4.2 Descriptive Statistics

The study collected quarterly secondary data a period of 10 years between 2010 and 2019. Given that, the collective investment scheme sector is subdivided into four unit trusts that include Money Market Funds, Balanced Funds, Equity Funds and Fixed income Funds, the data collection and analysis was based on that categorization. The summary statistic results are presented under table 4.1

Table 4.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Money market yields	40	.0894267	.0212971	.0490011	.140686
Balanced funds yields	40	.0101619	.0396833	-.120613	.0936268
Equity funds yields	40	.0111816	.0595684	-.1780708	.1312846
Fixed income funds yields	40	.0025182	.0211087	-.0489577	.0447522
LnReal GDP	40	13.7951	.1764757	13.46632	14.0814
Stock returns	40	-.005041	.1090029	-.3243645	.2265006
LnCPI	40	5.029718	.2025751	4.654069	5.321887
LnInterest rate	40	2.726389	.1505112	2.504709	3.012589

Source: Author, 2020

Table 4.1 shows that the average yield for the balanced fund was 0.0894267 (SD=0.0212971) and minimum and maximum values of 0.0490011 and 0.140686 respectively. This indicates

that the average yield for the balanced fund was 8.94267% with the minimum and maximum values indicating positive returns over the period. The average yield for the balanced funds was 0.0101619 (SD=0.0396833) with minimum and maximum values of -0.120613 and 0.0936268 respectively. The finding indicates that the average return for the balanced fund was 1.01619% with a minimum value of -0.120613 indicating a negative yield in some periods. Equity funds had an average yield of 0.0111816 (SD=0.0595684) with minimum and maximum values of -0.1780708 and 0.1312846 respectively hence an indication that the average returns over the period for equity funds was 1.11816% with the negative minimum value indicating that a negative yield in some periods. The average yield for the fixed income funds was 0.0025182(SD=0.0211087) with minimum and maximum values of -0.0489577 and 0.0447522 respectively indicating that the average return over the period was 0.25182% with the negative minimum value indicating that a negative yield in some periods. Based on the findings, the money market fund had the greatest average return (8.94267%), followed by equity funds yields (1.11816%), balanced funds yields (1.01619%) and fixed income funds yields (0.25182%) respectively.

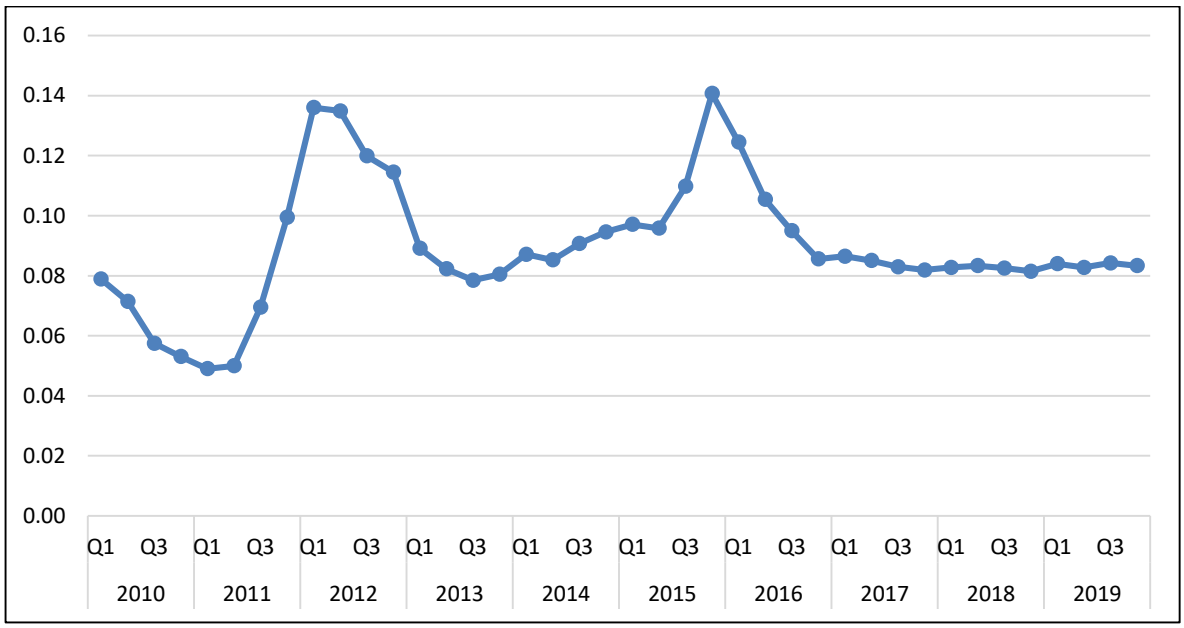
The average value for real GDP was 13.7951 (SD=0.1764757) with minimum and maximum values of 13.46632 and 14.0814 while stock returns had an average value of -0.005041 (SD=0.1090029) with minimum and maximum values of -0.3243645 and 0.2265006 respectively. CPI had an average value of 5.029718(SD=0.2025751) with minimum and maximum values of 4.654069 and 5.321887 respectively. Finally, interest rates had an average value of 2.726389 (SD=0.1505112) with minimum and maximum values of 2.504709 and 3.012589 respectively.

4.3 Trend Analysis

This entailed a graphical representation of CIS returns (yields) and Real GDP, NSE 20 share index, inflation (CPI) and interest rates. The results were as follows

4.3.1 Trend Analysis for Money Market Funds Yields

Figure 4.1: Trend for Money Market Funds Yields

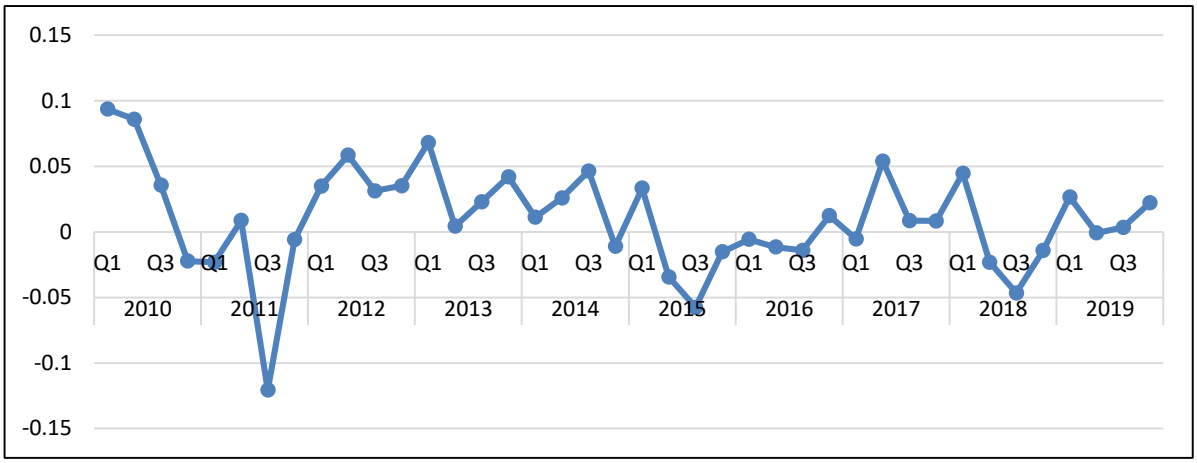


Source: Author, 2020

Figure 4.1 shows that the trend for money market funds yields gradually declined from the first quarter of 2010 to the second quarter of 2011 followed by a gradual increase from the third quarter to the second quarter of 2012. Thereafter, a decline was recorded up to 2013 followed by a steady increase up to the last quarter of 2015 then a decline all the way from the first quarter of 2016 to the last quarter of 2019. From the graph, most the declines were recorded in the years 2012, 2013, 2016 and 2018 which can be attributed to during political campaigns and subsequent general elections.

4.3.2 Trend Analysis for Balanced Funds Yields

Figure 4.2: Trend for Balanced Funds Yields

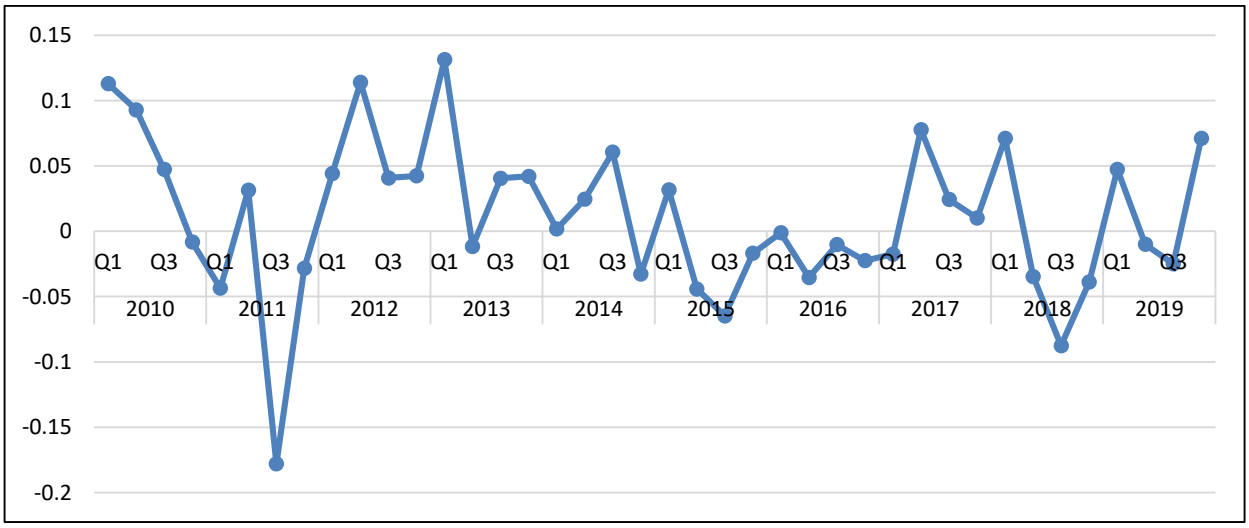


Source: Author, 2020

Figure 4.2 shows that a steady decline in the trend of balance funds yields was recorded from the fists quarter of 2010 all the way to the third quarter of 2011 after which a steady rise in returns was recorded up to the first quarter of 2013. Thereafter, up and down fluctuations were recorded from the second quarter of 2013 all the way to the last quarter of 2019. Most declines were recorded the second quarters of 2011, first quarter of 2013, second quarter of 2015, 2017 and 2018 respectively.

4.3.3 Trend Analysis for Equity Funds Yields

Figure 4.3: Trend for Equity Funds Yields

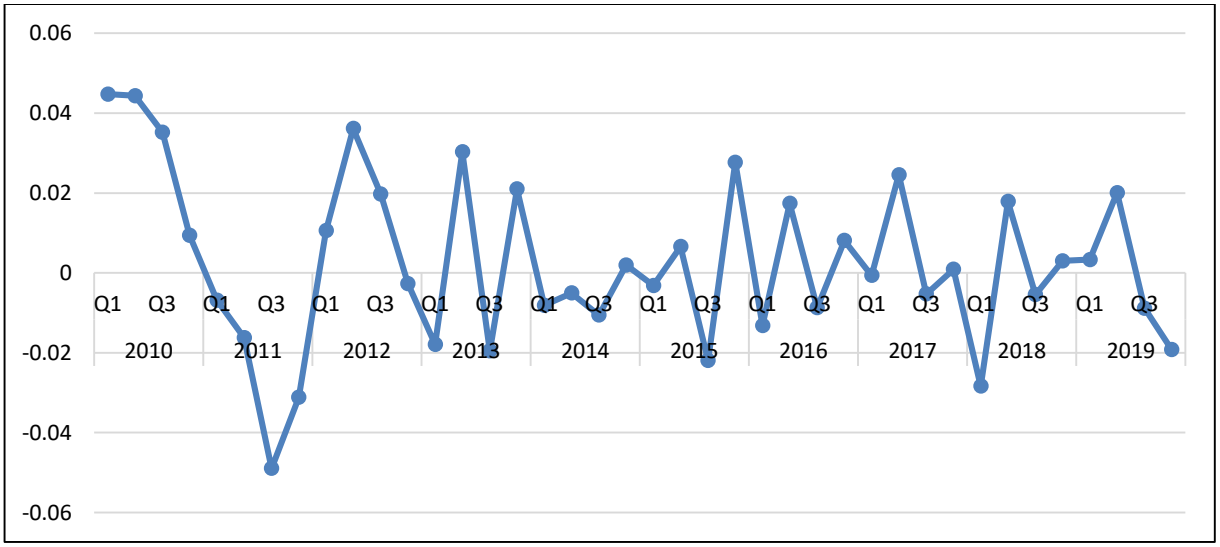


Source: Author, 2020

The trend for equity fund yields shows that a steady decline was recorded between the first quarter of 2010 all the way up to the third quarter of 2011 then followed by a steady increase up to the second quarter of 2012. Thereafter, up and down fluctuations were recorded between the third quarter of 2012 all the way to the first quarter of 2018 when a sharp decline was recorded followed by a steady raise in the yields.

4.3.4 Trend Analysis for Fixed Income Funds Yields

Figure 4.4: Trend for Fixed Income Funds Yields

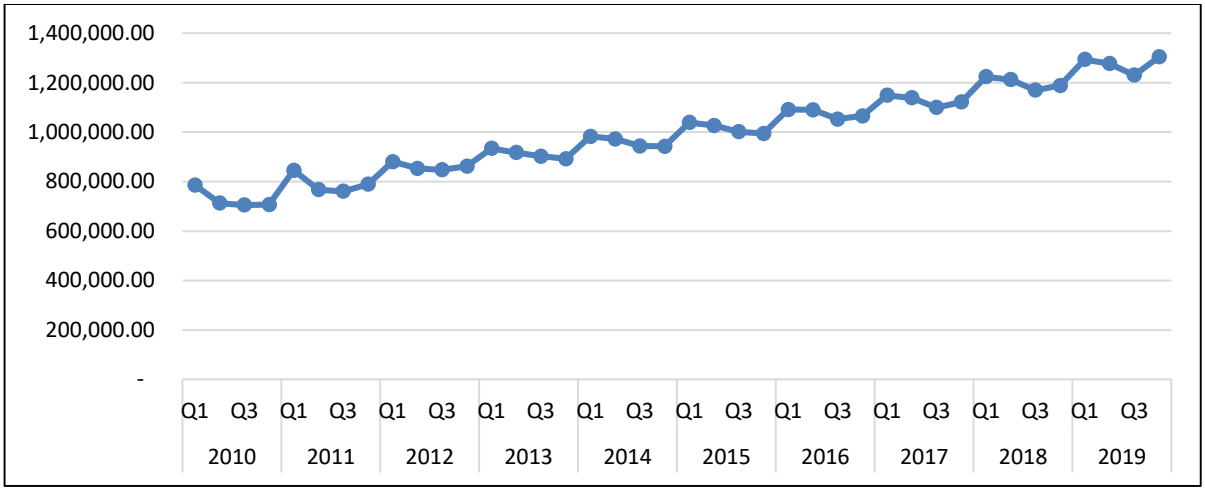


Source: Author, 2020

Figure 4.4 shows that there as sharp decline in fixed income funds yields from the first quarter of 2010 to the third quarter of 2011 followed by a sharp rise up to the third quarter of 2013 then a sharp decline up to the first quarter of 2013. Thereafter up and down fluctuations were witnessed from the second quarter of 2013 up to the second quarter of 2017 where a sharp decline was recorded then subsequent rise and falls in the yields.

4.3.5 Trend Analysis for Real GDP

Figure 4.5: Trend for Real GDP

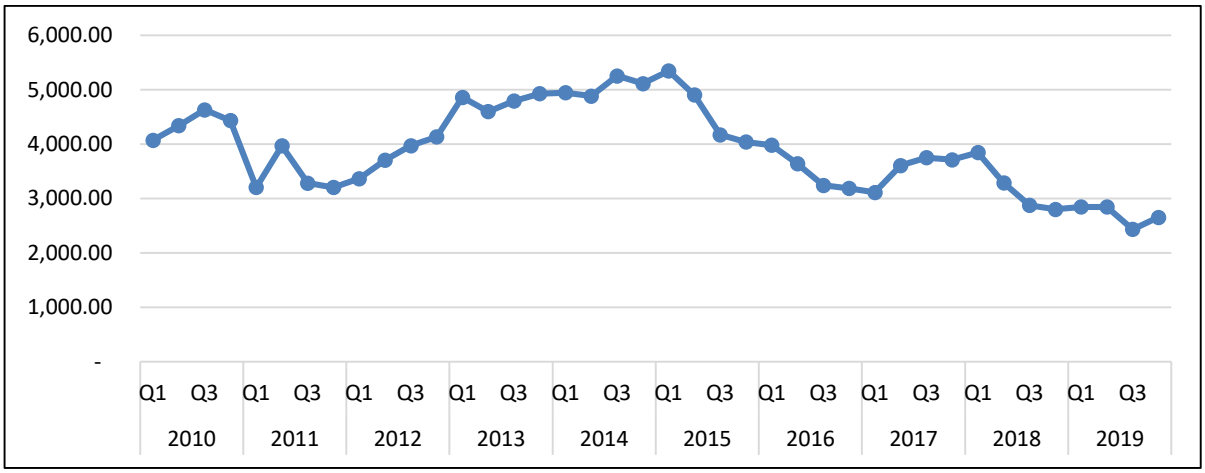


Source: Author, 2020

The real GDP trend in figure 4.5 indicates a steady rise in GDP over the considered study period. However, minimal up and down fluctuations were witnessed in some quarters.

4.3.6 Trend Analysis for NSE 20 Share Index

Figure 4.6: Trend for NSE 20 Share Index

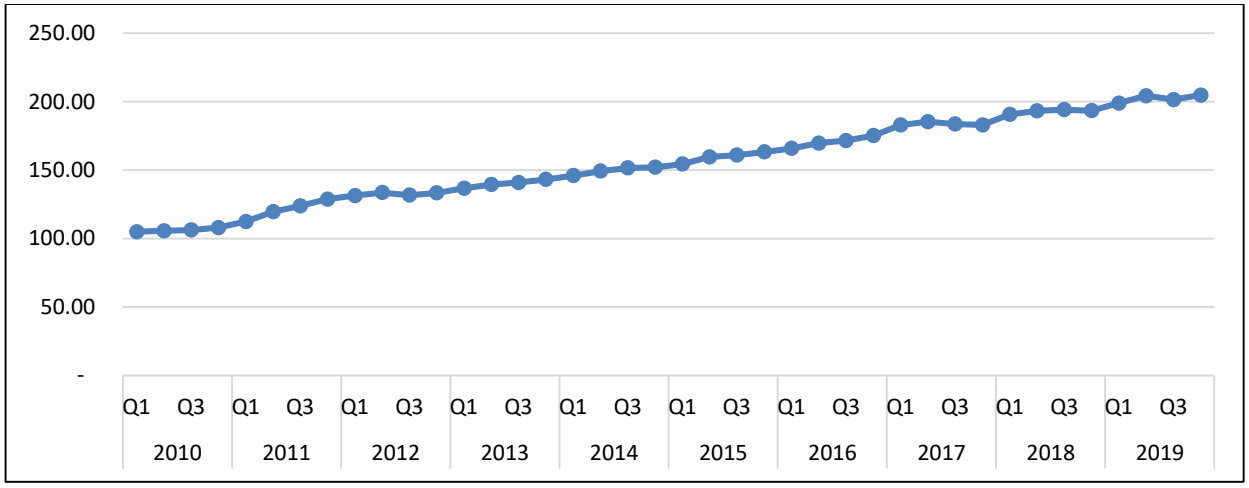


Source: Author, 2020

Figure 4.6 shows that the trend for the NSE 20 share index steadily declined from the third quarter of 2010 to the second quarter of 2011 followed by a steady rise in the index up to the fourth quarter of 2015. Thereafter, a steady decline was recorded up to the last quarter of 2019 hence an indication of a decline in stock market performance.

4.3.7 Trend Analysis for CPI

Figure 4.7: Trend for CPI

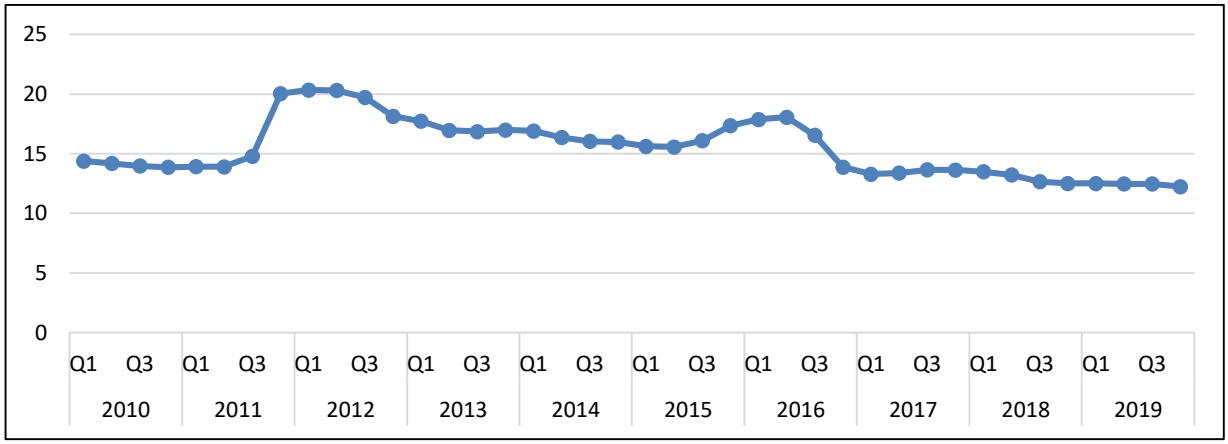


Source: Author, 2020

Figure 4.7 indicates a steady rise in the CPI over the considered study period. This indicates a gradual increase in inflation in the country between 2010 and 2019.

4.3.8 Trend Analysis for Interest Rates

Figure 4.8: Trend for Interest Rates



Source: Author, 2020

The weighted average lending interest rates trend in figure 4.8 indicates that interest rates were stable between the first quarter of 2010 and the third quarter of 2013 when a steady increase was recorded followed by stable interest rates up to the second quarter of 2016. Thereafter a steady decline was witnessed up to the fourth quarter of 2016 followed by stable

lending rates mostly attributable to interest rates capping as from 2017.

4.4 Diagnostic Tests

The study undertook the multicollinearity, stationarity, normality, heteroscedasticity and autocorrelation tests.

4.4.1 Multicollinearity Test

The multicollinearity test was undertaken using the variance inflation factors (VIF) whose cut off value is 10. In this study, any variable identified to have a VIF of more than 10 was considered highly collinear to other variables hence it was dropped from the study. Table 4.2 show the results

Table 4.2: Multicollinearity Test

Variable	**VIF**	**1/VIF**
LnReal GDP	19.91	0.050221
LnCPI	19.50	0.051289
LnInterest rates	1.26	0.793834
Stock returns	1.05	0.955353
Mean VIF	10.43	

Source: Author, 2020

The multicollinearity test on table 4.2 shows that Real GDP had a VIF value of 19.91 while CPI had a VIF value of 19.50 both of which were greater than 10 hence an indication of multicollinearity. The study thus dropped inflation (CPI) as a variable and remained with GDP since it is the independent variable. Interest rates and stock returns on the other hand had VIF values of 1.26 and 1.05, which were below the cut off VIF value of 10 respectively.

Table 4.3: Multicollinearity Test after dropping Inflation (CPI)

Variable	VIF	1/VIF
LnReal GDP	1.28	0.783403
LnInterest rates	1.25	0.797498
Stock returns	1.04	0.962748
Mean VIF	1.19	

Source: Author, 2020

Table 4.3 show that the VIF value for real GDP was 1.28 after dropping inflation while the VIF values for interest rates and stock returns were 1.25 and 1.04 respectively. The finding indicates that the variables were not highly correlated hence they did not suffer from multicollinearity.

4.4.2 Stationarity Test

The stationarity test was done using the ADF test to determine whether the means and variances of the different variables remain the same over time. Table 4.1 shows the results

Table 4.4: Stationarity Test

Variable		Test statistic	Asymptotic p-value
Money market yields	At level	-3.60205	0.005751
	At first differencing	-3.63765	0.009449
Balanced funds yields	At level	-4.67534	0.000529
	At first differencing	-6.40686	0.000000
Equity funds yields	At level	-3.04432	0.03098
	At first differencing	-6.81401	0.000000
Fixed income funds yields	At level	-4.27636	0.0004832
	At first differencing	-3.49688	0.008095
LnReal GDP	At level	-0.285947	0.9247
	At first differencing	-3.66657	0.004633
Stock returns	At level	-6.96903	0.000000
	At first differencing	-7.38429	0.000000
LnInterest rate	At level	-0.853913	0.8031
	At first differencing	-3.70222	0.004105

Source: Author, 2020

The results on table 4.4 show that money market yields, balanced funds yields, equity funds yields, fixed income funds yields and stock market return variables were stationary both at level and after fists differencing since all the P values were less than 0.05. However, GDP and interest rates were not stationarity at the level but became stationary after first differencing.

4.4.3 Normality Test

The researcher used the Shapiro-Wilk test to confirm the normality of the variables. Table 4.5 shows the results

Table 4.5: Normality Test

Variable	Obs	W	V	z	Prob>z
Money market yields	40	0.94754	2.025	1.486	0.06450
Balanced funds yields	40	0.96313	1.457	0.793	0.21401
Equity funds yields	40	0.96314	1.457	0.792	0.21409
Fixed income funds yields	40	0.98435	0.619	-1.011	0.84394
Ln Real GDP	40	0.96583	1.351	0.632	0.26356
Stock returns	40	0.96874	1.236	0.445	0.32808
LnInterest rates	40	0.94663	2.110	1.571	0.05811

Source: Author, 2020

Table 4.5 shows that normality test results using the Shapiro-Wilk test. The results shows that all the p values were greater than the significance value of 0.05. This leads to the rejection of the null hypothesis that the data is not normally distributed and adoption of alternative hypothesis that the data is distributed normally.

4.4.4 Heteroscedasticity Test

The Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was used to assess for heteroscedasticity. This test is normally carried out with the intention of determining the

variability in variables by observing the error terms. Table 4.6 shows the heteroscedasticity test results for the four equations which comprised of the money market, balanced, equity and fixed income funds.

Table 4.6: Heteroscedasticity Test

Model	**Chi^2 Value**	**Prob > chi^2**	**Conclusion**	**Remedy**
1[a]	5.75	0.0165	Heteroscedastic	Used robust standard errors
2[b]	7.06	0.0079	Heteroscedastic	Used robust standard errors
3[c]	10.96	0.0009	Heteroscedastic	Used robust standard errors
4[d]	2.26	0.1326	Homoscedastic	None

a. Money market fund, b. Balanced fund, c. Equity funds, d. Fixed income funds

Source: Author, 2020

The results on table 4.6 shows the first, second and third models were heteroscedastic as indicated by P values of 0.0165, 0.0079 & 0.0009<0.05. However, the existence of heteroscedasticity was corrected by use of Robust Standard Errors. Model four on the other hand did not exhibit any sign of heteroscedasticity hence the data was homoscedastic.

4.4.5 Autocorrelation Test

The Breusch-Godfrey LM test for autocorrelation was used to assess for serial correlation in the study models. This test was done to determine the behaviour of the error term in subsequent years. Table 4.7 shows the autocorrelation test results for the four equations which comprised of the money market, balanced, equity and fixed income funds.

Table 4.7: Autocorrelation Test

Model	Chi^2 Value	Prob > chi^2	df	Conclusion	Remedy
1[a]	10.738	0.0010	1	Autocorrelation detected	Used robust standard errors
2[b]	0.755	0.3850	1	No autocorrelation	None
3[c]	0.764	0.3820	1	No autocorrelation	None
4[d]	0.182	0.6695	1	No autocorrelation	None

a. Money market fund, b. Balanced fund, c. Equity funds d. Fixed income funds

Source: Author, 2020

Table 4.7 shows that model one exhibited autocorrelation as show by the p value (0.0010<0.05). However, the existence of autocorrelation in the model was corrected by use of Robust Standard Errors. The second, third and fourth models did not exhibit and form of serial correlation as indicated by p values of 0.3850, 0.3820 and 0.6695>0.05 respectively.

4.5 Correlation Analysis

Correlation was undertaken to assess the association among the study variables as shown by table 4.8

Table 4.8: Correlation Analysis

	Money market yields	Balanced fund yields	Equity Funds yields	Fixed income funds yields	LnReal GDP	Stock returns	LnInterest rates
Money market yields	1						
Balanced fund yields	.076	1					
Equity funds yields	.104	.655**	1				
Fixed income funds yields	.123	.484**	.389*	1			
LnReal GDP	.171	-.133	-.117	-.168	1		
Stock returns	.079	.672**	.610**	.283	-.186	1	
LnInterest rates	.664**	.143	.159	.034	-.448**	.131	1
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Source: Author, 2020

Table 4.6 indicates that the association between real GDP and the money market was weak

and positive (0.171) whereas the correlations between real GDP and the balanced fund yields, equity funds yields and the fixed income funds yields were weak and negative (-0.133, -0.117 and -0.168 respectively. The correlations between stock return and money market yields as well as fixed income funds yields were weak and positive (0.079 & 0.283) but the correlation with balanced fund yields and equity funds yields were strong and positive (0.672 & 0.610) respectively. Finally, the correlation between interest rates and the money market yields was strong and positive (0.664) while the correlations with balanced fund yields, equity funds yields and fixed income funds yields were weak and positive as indicated by correlations of 0.143, 0.159 and 0.034 respectively. From the table, none of the correlations was above 0.7 thus an indication that the variables were not highly correlated.

4.6 Regression Analysis

The regression analysis was done at four levels based on specific unit trusts which entailed the Money Market Funds (Model 1), Balanced Funds (Model 2), Equity Funds (Model 3) and Fixed income Funds (Model 4) respectively. Table 4.9 shows a summary of the results.

Table 4.9: Regression Analysis

	Model 1[a]	**Model 2[b]**	**Model 3[c]**	**Model 4[d]**
Constant	-1.2589(0.000)	-0.1503(0.828)	-0.4122(0.635)	0.2808 (0.401)
LnReal GDP	0.07190 (0.000)	0.00857(0.846)	0.02427(0.663)	-0.01826(0.399)
Stock returns	0.01364(0.433)	0.28086(0.000)	0.44386(0.000)	-0.05063(0.114)
LnInterest rates	0.13072(0.000)	0.01600(0.645)	0.03332(0.477)	-0.00959(0.702)
R-square	**0.7223**	**0.5996**	**0.6627**	**0.0972**
F	**27.85 (0.000)**	**7.31(0.0006)**	**9.27 (0.0001)**	**1.29 (0.2922)**

P–values in parenthesis

a. Money market fund, b. Balanced fund, c. Equity funds d. Fixed income funds

Source: Author, 2020

Under model 1, the results indicate that the R square value was 0.7223 thus indicating that GDP, stock returns and interests account for 72.23% of the variation on the performance of the money market funds. The significant (P value = 0.000<0.05) F statistics value of 27.85 indicates that the model is statistically significant. The coefficient results indicate that GDP had a positive (B=0.07190) and significant (P value=0.000<0.05) relationship with money market funds returns. Stock returns had a positive (B=0.01364) and insignificant (P value=0.433>0.05) relationship with the money market fund returns. Interest rate however had a positive (B=0.13072) and significant (P value=0.00<0.05) relationship with money market fund returns.

In the second model, the R square value was 0.5996 thus indicating that GDP, stock returns and interests account for 59.96% of the variation on the performance of the balanced funds. The significant (P value = 0.000<0.05) F statistics value of 7.31 indicates that the model is statistically significant. The coefficient results indicate that GDP and interest rates had a positive (B=0.00857 & 0.01600) and insignificant (P values=0.846 & 0.645 >0.05) relationships with the balanced funds returns respectively. Stock returns on the other hand had a positive (B=0.28086) and significant (P value=0.000<0.05) relationship with the balanced funds.

In the third model, the R square value was 0.6627 thus indicating that GDP, stock returns and interests account for 66.27% of the variation on the performance of the equity funds. The significant (P value = 0.2922>0.05) F statistics value of 1.29 indicates that the model is not statistically significant. The coefficient results indicate that GDP and interest rates had a positive (B=0.02427 & 0.03332) and insignificant (P values=0.663 & 0.477>0.05) relationships with the equity funds returns respectively. Stock returns on the other hand had a positive (B=0.44386) and significant (P value=0.000<0.05) relationship with the equity

funds returns.

In the fourth model, the R square value was 0.0972 thus indicating that GDP, stock returns and interests account for 66.27% of the variation on the performance of the fixed income funds. The significant (P value = 0.000<0.05) F statistics value of 9.27 indicates that the model is significant. The coefficient results indicate that GDP, stock returns and interest rates had a negative (B=-0.01826, -0.05063 & -0.00959) and insignificant (P values=0.399, 0.114 & 0.702>0.05) relationships with fixed income funds yields respectively.

4.7 Interpretation of the Findings

The study revealed that GDP had a statistically significant relationship on the financial performance of money market funds but an insignificant relationship on financial performance of balanced, equity and fixed income funds. Thus, the finding thus indicate that real GDP significantly affects only the performance money market funds collective investments schemes in Kenya. A study by study by Adidu and Olannye (2006) described the macroeconomic factors as factors existing outside a firm but with an ability to affect the performance of the firm. The wellness of the entire economy as may be indicated by the country's GDP aggregates the individual performance of firms within the economy. The external factors can affect the firm either positively or negatively (Egbunike & Okerekeoti, 2018) with better performance in the GDP having a positive impact on individual firms, at times balance between the industries does not exist and some industries may be favored at the expense of others by policy makers.

Secondly, the study revealed that stock returns had statistically significant relationships with the financial performance of the balanced and equity funds but a statistically insignificant relationship on the performance of money market and fixed income funds. The finding

therefore indicates that stock returns significantly affects the financial performance of only the balanced and equity funds respectively. A study by Kyalo (2017) indicated that most of the fund managers are known to construct a portfolio that gives the best returns which comprises a combination of the Security investments and treasury bonds. Therefore, a better performance in the stock markets has been found to have a positive influence on the collective investment funds as they yield better returns which boost performance and hence contribute to the growth of CIS. Yousuf and Nilsson (2013) confirmed that the stock market performance was a mirror of the economy and good performance confirmed the wellness of the entire economy as evidenced in good performance of the individual firms including the collective investment firms. A study by Orok, Emori and Ikoh (2019) concluded that CIS plays a critical role in the development of the security market in Nigeria giving them even a better hand to be compared with the Global security markets.

Lastly, the results documented that interests' rates had a statistically significant relationship on the financial performance of money market funds but a statistically insignificant relationship on financial performance of balanced, equity and fixed income funds. The finding hence indicates that interests' rates significantly affects only the performance money market funds collective investments schemes in Kenya. A study by Okoth (2014) established that interest rates and bonds had a positive impact on the growth of collective investment schemes within the state. This was attributed to the levels of returns investment managers get from the assets they invest in which under high interest rate tend to give a higher return.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, summary of findings, conclusion, recommendations, limitation and suggestions for further research are discussed in line with the topic of study which is to examine the effect of GDP on financial performance of CIS's in Kenya.

5.2 Summary

The study's objective was to determine the impact of gross domestic product on the financial performance of collective investment schemes in Kenya. The research was based on the financial intermediation theory, agency cost theory, modern portfolio theory and the financial inclusion and development theories. The study adopted a casual research design and the population comprised of the nineteen licensed CIS in Kenya. The study used quarterly secondary data which was obtained from the Capital Market Authority, Central Bank of Kenya and the Kenya National Bureau of Statistics for a period of 10 years between 2010 and 2019. The collected data was first summarized in an excel sheet and descriptive statistics used to summarize it. A regression technique was then applied using STATA software version 14.2 and results interpreted in line with the research objectives. The analysis was done at four levels based on specific unit trusts which entail Money Market Funds, Balanced Funds, and Equity Funds and Fixed income Funds.

The descriptive statistics findings established that the average yield for the balanced fund was 8.94267% whereas the average return for the balanced fund was 1.01619% with a minimum value of -0.120613 indicating a negative yield in some periods. The results revealed that equity funds had an average yield of 1.11816% while the average yield for the fixed income

funds 0.25182% respectively. The findings thus indicated that the money market fund had the greatest average return (8.94267%), followed by equity funds yields (1.11816%), balanced funds yields (1.01619%) and fixed income funds yields (0.25182%) respectively. The average value for real GDP was 13.7951 while stock returns had an average value of -0.005041 respectively. CPI had an average value of 5.029718 while interest rates had an average value of 2.726389 respectively.

The trend analysis results established most the money market funds yields declines were recorded in the years 2012, 2013, 2016 and 2018 which can be attributed to during political campaigns and subsequent general elections. The trend of balance funds yields indicated that most declines were recorded the second quarters of 2011, first quarter of 2013, and second quarter of 2015, 2017 and 2018 respectively. The trend for equity fund yields showed up and down fluctuations were recorded between the third quarter of 2012 all the wat to the first quarter of 2018 when a sharp decline was recorded followed by a steady raise in the yields. The trend in fixed income funds yields showed up and down fluctuations were witnessed from the second quarter of 2013 up to the second quarter of 2017 where a sharp decline was recorded then subsequent rise and falls in the yields.

The real GDP trend depicted a steady rise in GDP over the considered study period. The trend for the NSE 20 share index steadily declined from the third quarter of 2010 to the second quarter of 2011 followed by a steady rise in the index up to the fourth quarter of 2015 then a steady decline was recorded up to the last quarter of 2019. The CPI trend indicated a steady rise in the CPI over the considered study period while the weighted average lending interest rates trend indicated that interest rates were stable between the first quarter of 2010 and the third quarter of 2013 when a steady increase was recorded followed by stable interest rates up to the second quarter of 2016. Thereafter a steady decline was witnessed up to the fourth

quarter of 2016 followed by stable lending rates mostly attributable to interest rates capping as from 2017.

Correlation results indicated that the association between real GDP and the money market was weak and positive whereas the correlations between real GDP and the balanced fund yields, equity funds yields and the fixed income funds yields were weak and negative respectively. The correlations between stock return and money market yields as well as fixed income funds yields were weak and positive but the correlation with balanced fund yields and equity funds yields were strong and positive respectively. Finally, the correlation between interest rates and the money market yields was strong and positive while the correlations with balanced fund yields, equity funds yields and fixed income funds yields were weak and positive respectively.

The coefficient results revealed GDP had a positive and significant relationship with money market funds returns. Stock returns had a positive and insignificant relationship with the money market fund returns. Interest rate however had a positive and significant relationship with money market fund returns. The study also found that GDP and interest rates had a positive and relationships with the balanced funds returns respectively. Stock returns on the other hand had a positive and significant (relationship with the balanced funds. Further, the study found that GDP and interest rates had a positive and insignificant relationship with the equity funds returns respectively. Stock returns on the other hand had a positive and significant relationship with the equity funds returns. Finally, the study documented GDP, stock returns and interest rates had a negative and insignificant relationships with fixed income funds yields respectively.

5.3 Conclusion

The findings established that GDP had a statistically significant relationship on the financial performance of money market funds but an insignificant relationship on financial performance of balanced fund, equity funds and fixed income funds. The study based on this finding concludes that real GDP significantly affects only the financial performance of the money market collective investments schemes in Kenya and does not significantly affect the financial performance of balanced fund, equity funds and fixed income funds CISs respectively.

The study results also revealed that stock returns had statistically significant relationships with the financial performance of balanced and equity funds but a statistically insignificant relationship on the performance of money market and fixed income funds. The study therefore concludes that stock returns significantly affects the financial performance of only balanced and equity funds collective investments schemes in Kenya respectively.

According to the study findings, interests' rates had a statistically significant relationship on financial performance of money market funds but a statistically insignificant relationship on financial performance of balanced fund, equity funds and fixed income funds. Based on this observation, the study concludes that interests' rates significantly affects only the performance money market funds collective investments schemes in Kenya.

5.4 Recommendations

The study documented that GDP positively and significantly affected the financial performance of the money market collective investment schemes but insignificantly affect the balanced fund, equity funds and fixed income funds financial performance. The study thus recommends that the fund and portfolio managers of money market funds should base

their investments on the trends of GDP growth and invest in money market instruments when the economy is performing well as this would enhance their funds financial performance in terms of yields.

The study also indicated that stock market performance positively and significantly affected the financial performance balanced and equity funds CISs in Kenya. The study thus recommend that the fund and portfolio managers of balanced and equity funds should also development portfolio investment strategies based on the performance of the stock market as well as invest based on the performance of the NSE index as this would enhance their performance.

Finally, the study documented that interest rates positively and significantly affects only the performance money market funds collective investments schemes in Kenya. The study based on this observation recommends that fund and portfolio managers of money market funds should take into consideration the interest rate levels before investing in various money market instruments as such would positively affect their yields.

5.5 Limitations of the Study

This study only relied on secondary data which is lagged and historical in nature and may not represent the current situation and also ignores the qualitative aspects and management policies. In addition, the study used quarterly data which covered 10 years despite the facts that some CISs had been in operation for more than 10 years. The study also did not seek the views of the management of the CISs on whether GDP affects the CISs performance.

The study's context was collective investment schemes in Kenya which belong to the financial sector. The financial sector comprises of other financial institutions like commercial banks, SACCOs, insurance firms and microfinances. The findings are thus limited to CIS

firms and may not be generalized to other financial entities. In addition, the findings may not be generalized to other countries.

The study also used the linear regression model for data analysis. The regression model is however based on various restrictions which may affect the final results. For instance, the study dropped inflation due to multicollinearity and the variable which had been considered did not form part of the final results.

The study was also limited to the considered research variables and measures which included the real GDP, stock market performance (measured in terms of market returns), inflation (CPI) and interest rates (measured through the weighted average lending rates). However there as other measures of the variables which may give different findings and results.

5.6 Suggestions for Further Research

The study did not incorporate the views of fund and portfolio managers who are key personnel in making portfolio selection and revision strategies as the study used secondary information sources. The study thus recommends a similar study which will incorporate the views of the management through use of primary data collection methods like questionnaires and interviews.

This study only focus on the effect of GDP and other macroeconomic factors including stock market performance, interest rates and inflation and their effect on CISs financial performance. The study thus did not review the various strategies used by CIS managers to address the change arising from changes in macroeconomic factors. The study thus recommends s study on the strategies used by portfolio and fund managers to address macroeconomic factors influencing CIS firm performance.

A similar study can also be carried out using other measures of GDP like the GDP growth rate, GDP per capita as well as other stock market indexes like the NASI and the NSE 15 and 25 shares indexes. In addition, other measure of interest rates such as the deposit rates and treasury bills rates can also be used to proxy the study variables. Finally, less restrictive models like the generalized regression models as well as the autoregressive models can be used to assess the relationship among the variables.

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APPENDICES

Appendix I: List of Licensed Collective Investment Schemes in Kenya

1. CIC Asset Management
2. British American Asset Managers
3. ICEA Lion
4. Old Mutual
5. Commercial Bank of Africa
6. African Alliance Kenya
7. Stanlib Kenya
8. Sanlam Investments
9. Madison Asset Managers
10. Dry Associates
11. Zimele Asset Managers
12. Nabo Capital (Centum)
13. Amana Capital
14. Equity Investment Bank
15. Genghis Capital
16. Cytonn Asset Managers
17. Apollo Asset Managers
18. Alpha Africa Asset Managers
19. Co-op Trust Investment Services Limited

Appendix II: Raw Data

Year	Quarter	Money market yield	Balanced Fund yields	Equity Funds yields	Fixed income Funds yields	Real GDP	NSE 20 share index	CPI	Interest rates
2010	Q1	0.079	0.094	0.113	0.045	786,481.00	4,072.90	105.01	14.39
	Q2	0.071	0.086	0.093	0.044	713,363.99	4,339.30	105.65	14.19
	Q3	0.057	0.036	0.047	0.035	705,260.19	4,629.80	106.32	13.98
	Q4	0.053	-0.022	-0.008	0.009	707,158.87	4,433.00	108.07	13.87
2011	Q1	0.049	-0.023	-0.044	-0.007	845,860.78	3,205.00	112.41	13.92
	Q2	0.050	0.009	0.031	-0.016	767,418.00	3,968.00	119.56	13.91
	Q3	0.069	-0.121	-0.178	-0.049	761,159.00	3,284.00	123.88	14.79
	Q4	0.099	-0.006	-0.028	-0.031	789,245.00	3,205.00	128.81	20.04
2012	Q1	0.136	0.035	0.044	0.011	880,802.00	3,367.00	131.36	20.34
	Q2	0.135	0.058	0.114	0.036	853,430.00	3,704.00	133.63	20.30
	Q3	0.120	0.031	0.041	0.020	847,709.00	3,972.00	131.78	19.73
	Q4	0.115	0.035	0.042	-0.003	862,398.00	4,133.00	133.35	18.15
2013	Q1	0.089	0.068	0.131	-0.018	934,377.00	4,861.00	136.72	17.73
	Q2	0.082	0.004	-0.012	0.030	917,617.00	4,598.00	139.46	16.97
	Q3	0.078	0.023	0.040	-0.020	902,369.00	4,793.00	140.99	16.86
	Q4	0.080	0.042	0.042	0.021	892,495.00	4,927.00	143.25	16.99
2014	Q1	0.087	0.011	0.002	-0.008	982,917.00	4,946.00	145.99	16.91
	Q2	0.085	0.026	0.025	-0.005	972,761.00	4,885.00	149.27	16.36
	Q3	0.091	0.046	0.060	-0.011	944,087.00	5,256.00	151.62	16.04
	Q4	0.095	-0.011	-0.033	0.002	942,421.00	5,113.00	152.09	15.99
2015	Q1	0.097	0.033	0.032	-0.003	1,039,433.00	5,346.00	154.48	15.62
	Q2	0.096	-0.034	-0.044	0.007	1,026,833.00	4,906.00	159.71	15.57
	Q3	0.110	-0.058	-0.065	-0.022	1,001,471.00	4,173.00	160.93	16.09
	Q4	0.141	-0.015	-0.017	0.028	994,165.00	4,040.00	163.27	17.35
2016	Q1	0.125	-0.006	-0.001	-0.013	1,091,747.00	3,982.00	165.92	17.87
	Q2	0.105	-0.012	-0.035	0.017	1,090,548.00	3,641.00	169.76	18.06
	Q3	0.095	-0.014	-0.010	-0.009	1,053,014.00	3,243.00	171.56	16.55
	Q4	0.086	0.012	-0.023	0.008	1,065,389.00	3,186.00	175.18	13.88
2017	Q1	0.086	-0.005	-0.017	-0.001	1,149,000.00	3,112.52	182.98	13.29
	Q2	0.085	0.054	0.078	0.025	1,138,981.00	3,607.18	185.39	13.38
	Q3	0.083	0.009	0.024	-0.005	1,100,234.00	3,751.50	183.66	13.65
	Q4	0.082	0.008	0.010	0.001	1,121,607.00	3,711.90	183.05	13.64
2018	Q1	0.083	0.045	0.071	-0.028	1,224,057.00	3,845.30	190.62	13.49
	Q2	0.083	-0.023	-0.035	0.018	1,212,316.00	3,285.70	193.31	13.22
	Q3	0.083	-0.047	-0.088	-0.005	1,170,098.00	2,875.50	194.14	12.66
	Q4	0.081	-0.014	-0.039	0.003	1,188,361.00	2,801.00	193.51	12.51

2019	Q1	0.084	0.027	0.047	0.003	1,293,940.00	2,846.40	198.91	12.51
	Q2	0.083	-0.001	-0.010	0.020	1,277,070.00	2,846.35	204.34	12.47
	Q3	0.084	0.003	-0.025	-0.009	1,230,750.00	2,431.97	201.57	12.47
	Q4	0.083	0.022	0.071	-0.019	1,304,595.00	2,654.39	204.77	12.24

Sources: CMA, CBK, KNBS

Appendix III: Regression Outputs

Model 1

```
. regress Moneymarketyield LnRealGDP Stockreturns LnInterestrates, vce(robust)

Linear regression                               Number of obs =      40
                                                F(  3,    36) =   27.85
                                                Prob > F      =  0.0000
                                                R-squared     =  0.7223
                                                Root MSE      =  .01168
```

Moneymarketyi~d	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
LnRealGDP	.0719088	.0092713	7.76	0.000	.0531056	.090712
Stockreturns	.0136474	.0172044	0.79	0.433	-.0212448	.0485395
LnInterestrates	.1307245	.0151278	8.64	0.000	.1000439	.1614051
_cons	-1.2589	.1573022	-8.00	0.000	-1.577923	-.9398759

Model 2

```
. regress BalancedFundyields LnRealGDP Stockreturns LnInterestrates, vce(robust)

Linear regression                               Number of obs =      40
                                                F(  3,    36) =    7.31
                                                Prob > F      =  0.0006
                                                R-squared     =  0.5996
                                                Root MSE      =  .02614
```

BalancedFundy~s	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
LnRealGDP	.0085729	.0438058	0.20	0.846	-.0802694	.0974152
Stockreturns	.2808613	.0690848	4.07	0.000	.1407509	.4209718
LnInterestrates	.0160013	.0344526	0.46	0.645	-.0538717	.0858744
_cons	-.1503125	.6881773	-0.22	0.828	-1.546001	1.245376

Model 3

```
. regress EquityFundsyields LnRealGDP Stockreturns LnInterestrates, vce(robust)

Linear regression                               Number of obs =      40
                                                F(  3,    36) =    9.27
                                                Prob > F      =  0.0001
                                                R-squared     =  0.6627
                                                Root MSE      =  .03601
```

EquityFundsyi~s	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
LnRealGDP	.0242711	.0552252	0.44	0.663	-.0877308	.1362729
Stockreturns	.4438689	.0976849	4.54	0.000	.2457547	.6419831
LnInterestrates	.0333248	.0463862	0.72	0.477	-.0607507	.1274003
_cons	-.4122588	.859967	-0.48	0.635	-2.156353	1.331835

Model 4

```
. regress FixedIncomeFundsyields LnRealGDP Stockreturns LnInterestrates
```

Source	SS	df	MS		
Model	.001688423	3	.000562808	Number of obs =	40
Residual	.015689134	36	.000435809	F(3, 36) =	1.29
				Prob > F =	0.2922
				R-squared =	0.0972
				Adj R-squared =	0.0219
Total	.017377557	39	.000445578	Root MSE =	.02088

FixedIncomeFu~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LnRealGDP	-.0182623	.0214012	-0.85	0.399	-.061666	.0251414
Stockreturns	.0506371	.0312551	1.62	0.114	-.0127513	.1140255
LnInterestrates	-.0095944	.0248704	-0.39	0.702	-.0600338	.0408451
_cons	.2808613	.3303769	0.85	0.401	-.3891741	.9508968

Appendix IV: Diagnostic Test Outputs

Model 1

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of Moneymarketyield

         chi2(1)      =     5.75
         Prob > chi2  =   0.0165

. estat vif
```

Variable	VIF	1/VIF
LnRealGDP	1.28	0.783403
LnInterest~s	1.25	0.797498
Stockreturns	1.04	0.962748
Mean VIF	1.19	

```
. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation
```

lags(p)	chi2	df	Prob > chi2
1	10.738	1	0.0010

H0: no serial correlation

Model 2

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of BalancedFundyields

         chi2(1)      =     7.06
         Prob > chi2  =   0.0079

. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation
```

lags(p)	chi2	df	Prob > chi2
1	0.755	1	0.3850

H0: no serial correlation

```
. estat vif
```

Variable	VIF	1/VIF
LnRealGDP	1.28	0.783403
LnInterest~s	1.25	0.797498
Stockreturns	1.04	0.962748
Mean VIF	1.19	

Model 3

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of EquityFundsyields

         chi2(1)      =    10.96
         Prob > chi2  =   0.0009
```

```
. estat vif
```

Variable	VIF	1/VIF
LnRealGDP	1.28	0.783403
LnInterest~s	1.25	0.797498
Stockreturns	1.04	0.962748
Mean VIF	1.19	

```
. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation
```

lags(p)	chi2	df	Prob > chi2
1	0.764	1	0.3820

H0: no serial correlation

Model 4

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of FixedIncomeFundsyields

         chi2(1)      =     2.26
         Prob > chi2  =   0.1326
```

```
. estat vif
```

Variable	VIF	1/VIF
LnRealGDP	1.28	0.783403
LnInterest~s	1.25	0.797498
Stockreturns	1.04	0.962748
Mean VIF	1.19	

```
. estat bgodfrey

Breusch-Godfrey LM test for autocorrelation
```

lags(p)	chi2	df	Prob > chi2
1	0.182	1	0.6695

H0: no serial correlation