MACROECONOMIC VARIABLES, DIASPORA REMITTANCES AND THE GROWTH OF BOND MARKETS IN KENYA

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Macroeconomic Variables Diaspora Remittances and the Growth of Bond Markets in Kenya

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DECLARATION

This is my original work and it has not been submitted for a degree at any other university.

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DEDICATION

This thesis was dedicated to members of my family particularly Josephat my husband, and my three children, Rooney, Velma and Jeremy for their prayers, words of encouragement and support in course of doing this study. Without their understanding and patience, the study would not have been successful.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB   African Development Bank

ADF   Augmented Dickey Fuller

ANOVA   Analysis of Variance

ARDL   Autoregressive Distributed Lag Model

BMG   Bond Market Growth

CBK   Central Bank of Kenya

CDSC   Central Depository and Settlement Corporation

CMA   Capital Market Authority

CV   Coefficient of Variation

CPI   Consumer Price Index

DR   Diaspora Remittance

DW   Durbin Watson

EAC   East African Community

EMH   Efficient Market Hypothesis

EX   Exchange Rate

FOREX   Foreign exchange rate

GDP   Gross Domestic Product

ICMA   International Capital Markets Association

IFC   International Finance Corporation

IMF   International Monetary Fund

INF   Inflation Rate

INT   Interest Rate

KNBS   Kenya National Bureau of Statistics

KShs   Kenyan Shillings

NASI   All Share Index

NSE   Nairobi Securities Exchange

OECD   Organization for Economic Cooperation and Development

OLS   Ordinary Least Squares

USA	United States of America
VAR	Vector Auto Regression
VECM	Vector error correlation model
VIF	Variance Inflation Factor
GMM	Gaussian Mixture Model

OPERATIONAL DEFINITION OF TERMS

Diaspora Remittance   This is the money, goods, and services that migrant workers working abroad or outside their country of origin transmit to households in their countries of origin (Musakwa & Odhiambo, 2020).

Exchange Rate   This is a term used to describe the value of a currency in a country expressed in the currency of another country (Fanelli & Straub, 2020). It specifies the value or the rate of exchange at which country A currency can be converted into country B currency.

Gross Domestic Product   This measures the monetary worth of final goods and services produced in a country over a specific period of time for example quarterly or yearly and it also accounts for all the outputs produced within a country's borders (Kira, 2013).

Growth of Bond Market   This focuses on the percentage change in value and volume of the bond market size. The bond market of a country is expected to grow at an above-average speed compared to the overall economy (Mishkin & Eakins, 2019).

Inflation Rate   The general increase in prices of commodities, which may remain constant in a country over a given period of time. It is also a steady rise in an economy's overall price levels over a given time period (Mogire, 2016).

Interest Rate
This refers to the fees levied by a lender on a borrower for using money or capital owned by the lender, as determined by demand and supply forces (Jui, Sakib & Rafsan, 2020).

Macroeconomic Variables
Macroeconomic variables are influential, fiscal, natural, or geopolitical features relevant to wide economy at a national or regional level and have notable effects on the larger population (World Bank, 2013).

ABSTRACT

The growth of the bond market is critical to the economy and the development of financial systems in various countries, and it has continued to rise across borders. Bond market growth contributes to the economy by attracting foreign investors, providing an efficient economic system, offering greater investment opportunities and deepening of the financial markets. A country with a macro-economic environment that is stable results in vigorous bond markets. The general objective of the study was to examine the effects of macroeconomic variables on the growth of bond markets in Kenya. This study specifically focused on the influence of inflation rate, interest rate, exchange rate and gross domestic product on the growth of bond markets in Kenya. In addition, the study evaluated the diaspora's remittance as a moderating variable on the relationship between macro-economic variables and the growth of bond market. The population of the study consists of 240 monthly market observations. For this study, a census survey was carried out. To achieve the study's objectives, four theories were used; inflation and money illusion theory, liquidity preference theory, purchasing power parity theory, pure self-interest theory and endogenous growth theory. Secondary data was gathered from the Kenya National Bureau of Statistics, the Nairobi Securities Exchange, and the Central Bank of Kenya. The research design used in this study was descriptive casual survey. Using a secondary data collection sheet, a twenty-year period from 2001 to 2020 was covered. Diagnostic tests were conducted to prevent adverse effects caused by wrong measurements in the regression model. Time series regression analysis was used to determine the relationship between the independent variables, moderating variable, and dependent variable. Tables, figures, and graphs were used to present the data. The findings revealed that there was a positive significant influence of the inflation rate, interest rate, exchange rate, and GDP on the growth of bond market. As a result, it was concluded that the inflation rate, interest rate, exchange rate, and GDP have an influence on bond market growth. The moderating variable of diaspora remittance also had a significant moderating effect on the relationship between macroeconomic variables and the growth of bond market. The study recommended that the government and its fiscal agents to review policy on monetary issues to regulate inflation levels in the economy, control interest rate charged thus stabilizing them to encourage investment, apply monetary policies and regulations to monitor exchange rate fluctuations in the market and come up with policies and measures that improves the productivity in the country. The national assembly needs to provide a conducive environment for diaspora investors through the formulation of favorable investment policies, ensuring political stability, minimizing bureaucracy, managing corruption and educate them on the importance of investing back home. Further research should also be done, taking into account additional macroeconomic variables not covered in the study.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The markets where financial assets such bonds, debentures, shares, and a variety of other instruments are traded are referred to as financial markets. It is a place where funds are moved from individuals with additional surplus financial resources to those who require the same amount of cash. Bond markets are financial markets in which money is transferred from savers to investors, thereby improving the economy's efficiency. Rapid economic growth requires a healthy financial market, and vice versa (Cournède & Denk, 2015).

Bonds are debt instruments that are issued by financial institutions, and because interest payments are tax deductible, they are frequently less expensive sources of capital. It entails the issuer repaying the lender over a certain time period for the principal as well as interest amount. Since bond holders are creditors in the bond market, they have a stronger claim to the company's assets (Mishkin & Eakins, 2019).

Bond markets provide governments and private sector companies with an additional method of funding long-term projects and reducing budget deficits. Due to the country's expanding investment choices and expanding financial markets, foreign investors are drawn to it. Bond markets' main objective is to promote both the public and private sectors during the growth process. (Nwajiaku, Ananwude & Obi-Nwosu, 2020).

Additionally, the bond market guarantees monetary policy direction, stable interest rates across maturity ranges, and the capacity to hedge bond lending (Boukhatem, 2021). The bond market's sustainability in terms of mobilizing both foreign and domestic funding sources for the purpose of investment is one of the most important contributions to a well-functioning financial market in economic growth (Boukhatem & Sahut, 2021).

The growth of the bond market has been linked to reduced risks associated with global capital mobility and higher savings rates hence governments have made steps to promote the same. Bond market growth boosts economic variables by encouraging saving, increasing investment size, and accommodating risk events. It benefits the economy by allowing for a more efficient economic structure. A bond market with poor growth rate reduces economic efficiency and raises the possibility of financial instability (Balima & Combes, 2019).

Early stages of bond market growth necessitate significant effort to reinforce and improve the market's short end such as securities transparency and instrument strategy (Greenwood, Hanson & Stein, 2010). In order for financial markets to grow effectively, a country must have a robust bond market (Garang, 2019). Ngugi and Agoti (2009) asserts that a stable, strong, and enlightened bond market needs to exhibit stable macroeconomic variables, efficiency, transparency, a sound legal and regulatory framework, appropriate trading systems.

The world financial crisis of 2007-2008 significantly increased the importance of East Asian countries' bond markets. It acted as a source of finance, signaling a corporate shift away from overreliance on bank debt and increased government borrowing. Bond statistics indicate that countries with developed economies, such as the United States, dominate the bond market, which has the world's largest and most developed debt market (African Development Bank, 2009).

The global bond market was estimated to be worth 105.9 trillion US dollars in 2019, with 41.2 trillion US dollars coming from the US market, 21.8 trillion US dollars coming from the European market, and 6.3 trillion US dollars coming from the UK market. The Sub-Saharan African bond market is estimated to be worth 300 billion USD, with Kenya accounting for only 6.92 billion US dollars (Fabozzi & Fabozzi 2021).

In East Asian nations, the following elements are crucial for having a robust bond market: sustaining macroeconomic stability characterized by low inflation, constant interest rates, and improving the regulatory system in the market (Hue & Tram, 2019). It is widely acknowledged that in countries where rules and regulations are

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strictly enforced, such as Australia, China, Korea, and Taipei the banks are more market-oriented and bond markets grow at a faster rate when the macroeconomic environment is stable (Maina & Kimutai, 2018).

Another concern in the African context is the size and complexity of Nigeria's bond market. As a result, the Nigerian local currency and the bond markets appear relatively unappealing to foreign direct investment involvement. The unfavorable exchange rate regime that investors both domestic and foreign, in the bond market in Nigeria are subjected to; exacerbates the problem. (Ogbonna & Onyia, 2021).

Most emerging bond markets, including the Kenyan market, are characterized by weak corporate mechanisms, an unstable macroeconomic environment, ineffective corporate governance, a weakened regulatory framework, and instability in the economy and politics. This makes local and foreign investors' lack confidence in trading on debt securities. Exchange rates, interest rates, and bank credit all have a negative effect on bond market growth, necessitating the establishment of effective policies (Kemboi & Tarus, 2012).

According to Yahya, Rahim and Rashid (2016), it is worth observing that the government of Kenya made efforts to boost the growth of the bond markets. Also, it has implemented several reforms throughout the years in an effort to increase the rate of growth in the country's bond markets. In the year 2001, the Kenyan government commenced reforms to restructure the domestic bond market to ensure a sustainable funding source for long-term finances from both the public and private sectors (Hussain & Malik, 2011).

These changes include the establishment of a trading segment for fixed income securities on the Nairobi Securities Exchange, as well as tax incentives and other benefits that enable traders to decrease transaction costs. In addition, diversifying maturities, especially for treasury bonds, and modernizing the Treasury bond trading system to improve performance through advanced technologies (Hue & Tram, 2019).

The bond market enables investors to make wise investment decisions that match their individual risk and return preferences based on the information at hand (Githinji, 2011). Thus, bond markets support Kenya's economy by encouraging more savings and profitable investments. In actuality, a country should closely monitor the growth of the bond markets (Toduda, Masila, &Onsongo, 2012). Garang, (2019), highlights the following factors as contributing to a stable, strong, and enlightened bond market, which includes, but is not limited to, stable macroeconomic variables, efficiency, transparency, and volatility with low transaction costs.

Kenya has historically struggled to find long-term financial resources to fund infrastructure development projects. This justifies the necessity to rely on other funding sources such as bonds and concessions resulting from private sector participation to actualize the national government agenda. The bond market requires stabilization in order to promote economic growth of the country (Greenwood, Hanson & Stein, 2010).

Sarwar, Mustafa, Abid and Ahmad, (2018) asserts that it is vital to determine the effects of macroeconomic variables on the growth of bond markets because understanding the difficulties and challenges experienced by investors would provide some solutions to the problems. Macroeconomic factors have had a considerable influence on bond market growth, and the market investors want appropriate data to make informed decisions. Indeed, it is only after we have conducted some kind of analysis that we can provide practical solutions to these problems. As a result, in order to fill this gap, the study looked into macroeconomic variables and the growth of bond markets in Kenya.

1.1.1 Macro Economic Variables

Macroeconomics is a study of the economy as a whole. It is relevant to the entire economy, at a regional or national level, and it has a significant impact on a country's economic performance (Franklin Global Asset Management, 2010). The Kenya's National Bureau of Statistics (KNBS) publishes data on a variety of macroeconomic variables, including inflation, interest rates, employment of the informal sector, rate

of national savings, rate of GDP growth, and per capita GDP, among others (Ariemba, Mboya & Kamau, 2015).

In this study, it was determined that the following variables were significantly influencing factors; the rate of inflation, the rate of interest, the currency rate, the gross domestic product, and remittances from diaspora. These variables affect the whole population or entire economy, not a few selected people. All stakeholders, including business entities, governments, and people who participate in the bond market should pay attention to these aspects. These elements are crucial to the growth of the bond market since they affect the sector's growth rate (World Bank, 2012).

In today's world, we interpret macroeconomic variables quite differently within the parameters of the global economic crisis and other external economic shocks that occur, and we cannot apply directly observed macroeconomic variables in crisis situations in the same way that we do in a normal situation. The overall economy, as well as average demand and supply, are the subject of macroeconomics. The total amount spent in an economy, whether by domestic consumers, export consumers, the government, or businesses when they invest in capital equipment is known as average demand (Mishkin, 2010).

Macroeconomic variables provide leading indicators or signals about the state of the economy. To effectively manage the economy, economists, like any other specialists, must conduct research and understand the key factors that influence the macroeconomic environment (Bernharden, 2009). According to Lioe et al. (2006), the most important macroeconomic factors to consider when analyzing the global bond market are GDP, inflation, interest rates, and currency rates. These are critical indicators of the bond market's growth. Similarly, Aman, Isa and Naim (2020), observed that an unstable macro environment leads to a low bond market growth rate.

The Kenyan economy witnessed extremely unstable macroeconomic fluctuations around the end of 2011, including very high loan interest rates and high inflation rates, which prompted some domestic employees to engage in strike action. Since

international exchange rates were unfavorable, importers suffered huge losses on purchases, while farmers and exporters benefited from the same (Oriwo, 2012).

According to (Oriwo, 2012), the Central Bank of Kenya increased the base lending rates in an effort to stabilize the Kenyan currency, which had underperformed in relation to the major foreign currencies. However, as more money was going toward consumption than investments, all of these did have an impact on the returns of different investments made in the nation. Economic uncertainty spurred on by high inflation rates that makes investors apprehensive of bond market investments (Adhikari & Guru-Gharana, 2014).

Both developed and developing country central bankers, macroeconomists, policymakers, and investors are interested in comprehending the factors that affect inflation (Hussain & Malik, 2011). Whether they are low or moderate, a country's inflationary pressures affect its business sector, either favorably or unfavorably (Myers, 2014). Mukiza (2011) stated that the rate of inflation has a substantial impact on both the prices of goods and services exchanged in the market and the purchasing power of the currency.

The growth of the bond market is driven by a number of macroeconomic, industry, and market factors as well as firm-specific factors (Sprcic & Wilson, 2007). The key macroeconomic variables that influence bond market growth were found to be an economy's size, the volatility of exchange rates, the size of an economy, exchange rate volatility, inflation volatility, and the variability of interest rates (Aman, Isa & Naim, 2020). Regulatory enforcement, concentration of banking, transparency and corporate governance, the investment environment's level of risk, interest rate volatility, and an unstable macroeconomic environment all had a significant impact on bond market growth (Nkwede, 2020).

The changes in the inflation rate have a significant influence on the purchasing power of the currency as well as the prices of goods and services traded in the market (Mukiza, 2011). Inflationary pressures in a country, whether moderate or low, have an impact on the business sector either positively or negatively. Central bankers, macroeconomists, policymakers, and investors from both developed and emerging

countries are keen towards understanding the factors that influence inflation (Hussain & Malik, 2011). High inflation rates cause economic uncertainty, which makes investors wary of investing (Adhikari & Guru-Gharana, 2014).

High levels of inflation could have a negative effect on bond market and alter consumer prices, which would diminish the final output demand. Ultimately, how inflation affects a business depends on the nature of its operations, particularly the level of competition. Contrary to the nominal value of those entitlements that can confront receivables that have lower real value, inflation may impact the deterioration of the actual value of existing financial claims; as a result, lenders are negatively impacted while borrowers' benefit (Myers, 2014**).**

Low inflation is thought to be crucial for fostering the correct incentives for investors and allowing the growth of markets for fixed income instruments. It was noted that low inflation is a crucial prerequisite for the growth of debt markets since it results in less issuance of foreign bonds in addition to increasing reliance on domestic bond issuance. It has been argued that high inflation and significant budget deficits prejudice economic behavior in favor of short-term speculative projects and inhibit long-term investment initiatives that promote sustainable economic development (Ardakani, Kishor & Song, 2018).

The value of financial assets such as stocks, bonds, foreign currencies, as well as earnings from savings accounts and certificates of deposit, is largely determined by the rate of interest, a crucial macroeconomic determinant (Alam, Uddin & Yazdifar, 2019). Kenya's interest rates and exchange rates are comparable to a coin with the same side due to the persistence of interest rate volatility over time (Ogilo, 2014).. The bonds and stock market securities' market values are impacted by Kenya's fluctuating rising and declining interest rates (Mainga, 2014).

The exchange rate is a significant factor influencing the bond market (Gadanecz, Miyajima & Shu, 2018). The exchange rate refers to the total amount of domestic currency needed to buy one unit of a foreign currency. The exchange rate influences domestic and international commodity prices, as well as foreign demand for domestic commodities (Muchiri, 2012). Bond market growth is hampered by exchange rates,

interest rates, and bank credit, which require the execution of appropriate investment policies (Kahn, 2015).

When it comes to trading and investing in the market, the exchange rate is essential to a nation's economy (Adelegan & Radzewicz-Bak, 2009). It also significantly affects the returns of both local investors who favor investing in domestic markets and foreign investors who favor investing in domestic debt markets (Ndung'u, 2013). All elements of the free market, particularly its financial markets, are regulated by the situation of the foreign exchange market (Muchiri, 2012).

According to Mu et al. (2013), a pegged or largely fixed exchange rate promotes bond market growth by encouraging foreign investors to purchase more bonds. They also stated that it would definitely increase interest in the bond market. Instead, Hofmann, Shim and Shin (2020) contest the idea that pegged (very constant) exchange rates significantly skew the growth of the bond market because they induce certain investors to overestimate the risk associated with lending to corporations and banks. They go on to say that the impact of foreign competition may hinder the growth of domestic intermediation.

The gross domestic product (GDP) is the macroeconomic indicator of economic growth that is most frequently used to evaluate an economy's overall economic activities (Mwangi, 2013). Capital accumulation and factor productivity are the transmission mechanisms for economic growth. The researcher argues that economies of equal size in different countries exhibit some major variances in economic growth. The ability of the financial sector to influence increases in factor productivity can partially account for these variations (Burger and Warnock, 2007).

Interestingly, it is difficult to overlook the significance of the bond market as the mechanism by which the surplus savings unit of the economy is converted into medium and long-term investments in both developed and emerging economies. Additionally, the bond market's importance in promoting sustainable economic growth has been widely recognized. For instance, citing the role of the bond market in the 1997 Asian financial crisis (Adelegan & Radzewicz-Bak, 2009). Mu, Phelps, and Stotsky (2013) claim that the bond market not only promotes long-term

economic stability by mediating between capital savers and capital users, but it also gives growth-oriented businesses a way to raise capital away from banks and the stock market.

International competition that results from pegged exchange rates may hinder the growth of domestic intermediation because it encourages foreign investors to underestimate the risk of lending to banks and enterprises. Bond market growth is anticipated to have a positive association with gross domestic product (GDP) per capita, which represents the economy's stage of development. The investment climate is unstable, the government dominates business affairs, creditors' rights are weak, there is little transparency, and corporate governance is subpar in underdeveloped nations (Adelegan & Radzewicz, 2009).

According to Dilip and Sonia (2011), a diaspora is made up of people who have migrated for a variety of reasons and their offspring who have kept ties to their ancestral country. On the other hand, remittances are economic resources, typically in the form of money, that are transferred back to the nation of origin by diaspora residents (Usman, 2019). Diaspora remittances, also referred to as diaspora money, are sums of money, goods, or services that migrants or groups of migrants send back to their home countries (Amugune, 2018).

Kenyans who reside abroad frequently send money home to their native country. This money might be used for a number of things, such as investing and providing for their families Remittances have a positive growth impact when invested, but when they are spent, there is either no growth effect or a decline in economic performance (Adhikari & Guru-Gharana, 2014). Despite rising trends in remittances to Kenya, there are several variables that could ultimately result in a decline in remittance volume. These issues include a hardening of political attitudes toward new immigration as well as protracted unemployment in Europe and the US, which impacts the work prospects of current migrants (Osoro, 2020).

Table 1.1 presents the recorded data of macroeconomic variables (inflation rate, interest rate, exchange rate, and gross domestic product) from 2016 to 2020. According to a report published by the World Bank (2020), all the variables are generally unstable, resulting in unpredictable growth in the bond market. As a result, more research on these macroeconomic variables is needed to fill the existing gap.

Table 1.1: Summary of Macroeconomic Variables

Year	2016	2017	2018	2019	2020
Inflation Rates	6.3%,	8%,	4.7%	5.2%	5.4%
Interest Rates	16.6%	13.7%%	13.1%	12.4%%	12%
Exchange Rates	KES 101.5/USD Billion	KES 103.4/USD Billion	KES 101.3/USD Billion	KES 102.1/USD Billion	KES 106.5/USD Billion
Diaspora Remittance	USD 1.7241 Billion	USD 1.9458 Billion	USD 2.6969 Billion	USD 2.7906 Billion	USD 3.0939 Billion
GDP	$74.82 Billion	$82.04 Billion	$92.20 Billion	$100.38 Billion	$100.67 Billion

(World Bank Report, 2020)

The macroeconomic variables which play a big role in the connection between the market and investors and have an impact on their decision-making, are the most important in terms of the external environment (Santos, 2013). In this regard, it is feasible to observe how macroeconomic changes can affect the volume of investments made in the market by individuals and corporations who are the participants in the Nairobi securities exchange (Pyrczak & Bruce, 2011).

1.1.2 Growth of Bond Market

Greater economies are primarily concerned with bond market growth because it seeks to raise capital for both investment and government expenditure. The bond market consists of both government and corporate bonds that show a rapid growth

rate, particularly in countries whose macroeconomic environments are stable and predictable. However, in countries characterized by a volatile macroeconomic environment, they witness a poor growth rate (Ndunda, 2018).

Factors that typically influence the rate of growth of a bond market differ and comprise variety of firm, market, industry also macro-level elements (Sprcic and Wilson, 2007). Bond market growth is typically determined by a combination of macroeconomic variables such as interest rates, foreign direct investment, GDP, rate of exchange, remittances, rate of inflation, and money supply, among many others. These elements are the basis of every economy in a country. Bond price fluctuations are influenced by changes in the economy's fundamentals and the outlook for these fundamentals (Aduda, Masila & Onsongo, 2012).

The financial industry is primarily dominated by banks in most financial economies. Banks, on the other hand, are not well suited to finance long-term investments on a large scale because of the combination of short-term liabilities and long-term assets in their balance sheets, which causes maturity mismatches. It is vital to note, however, that a banking sector that is free of political intervention and functions on market principles can be a key source of bond market demand (Boukhatem, Ftiti, & Sahut, 2021).

The banking sector unquestionably functions as the bond market's dealer and marketer. As a result of Kenya's increased dependence on banks for financing, banks there appear to be in competition with the bond market in terms of money provision while simultaneously denying the bond market a share in the market. According to experience from industrialized countries, a healthy government and corporate bond market generates a conducive atmosphere for greater and more robust bond market growth (Ngugi & Agoti, 2009).

Bond markets in general, and corporate bond markets in particular, have been reported to develop rapidly in countries with more stable and predictable macroeconomic situations. Meanwhile, in countries with very uncertain macroeconomic environments, the corporate bond market has had to rely largely on government support in one way or another (Burger, Warnock & Warnock, 2015). A

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vibrant government bond market, according to industrial countries, creates a favorable climate for the establishment of a robust corporate bond market (Abbas & Christensen, 2010).

A vigorous bond market reduces the potential maturity mismatch in a bank-dominated financial sector, decreasing financial sector stability and lowering the cost of long-term investment for firms. Because bond markets fuel and sustain economic growth, it is important to pay closer attention to a country's bond market growth rate. The growth of the bond market is also supported by an effective, efficient, and market-driven banking sector (Aman, Isa & Naim, 2020).

Fiscal balance resulted in a huge supply of government bonds, which may be to blame for the decline in corporate bonds. However, if corporate and government bond growth is unbalanced, the entire bond market may suffer. Similarly, savings constitute an important component of corporate investments, and in emerging economies, savings account for a considerable portion of investable money. National endowment funds and pension funds, for example, are invested in the bond market in Kenya (Mugo, 2018).

East Asia's domestic bond markets are relatively large, with absolute values ranging from roughly $2 billion in Indonesia to about $300 billion in South Korea. The combined bond markets of the nine East Asian economies have a market value of around $800 billion, which is similar to about 7% of the US bond market or about 12% of the Japanese bond market. The size of East Asian bond markets, in relation to these economies, ranges from less than 2% of GDP in Indonesia to over 90% in Malaysia. In contrast, the bond market accounts for nearly 126 percent of US GDP, 143 percent in Japan, and 60 percent in Australia (Emery, 2018).

In recent years, a large economy like China has made the bond market a priority to entice in foreign investors (Livingston et al., 2018). The increase in government bond prices brings about market equilibrium and has a favorable effect on market expansion (Andritzky et al., 2012). According to Mu, Stotsky, and Phelps (2013), the bond market contributes to government deficit financing, economic stability, infrastructure development, and long-term growth financing. Banks, pension funds,

mutual funds, and hedge funds are the domestic entities that can affect the bond market.

The bond market, on a global scale, definitely serves as the channel by which the economy's savings surplus unit is convertible into medium- and long-term investments. Based on this, the growth of the bond market is viewed as an important player that changes the economy into the desired state. In order to assure the efficient and effective operation of long-term debt instruments, bond market developments have been put in place (Deschryver, & De Mariz, 2020).

Governments that have been helpful in establishing the bond market have not only strategically managed their long-term debt, but have also worked for changes to improve the institutional and structural frameworks of the market. These changes strengthen a healthy system of financial intermediation and minimize the overreliance on bank funding (Nkwede, Uguru & Nkwegu, 2016).

The Chinese bond market has been growing quickly in recent years, but it has also encountered several issues that could not be ignored. For instance, the regulatory framework for the market is not uniform, nor is the structure of the various bond types faultless. The bond prices change a lot as interest rate marketization continues to grow. However, as the Chinese financial market reform continues to deepen, these issues will be gradually resolved and would not be able to stop the strong growth of the bond market (Amstad & He, 2019).

Sub-Saharan Africa has relied largely on foreign grants and subsidized loans to pay for capital expenditures and budget deficits. Access to the world's capital markets is extremely restricted to a small number of nations. Donor flows to sub-Saharan Africa may be severely reduced as a result of the significant financial challenges that western donors are currently confronting. Without access to alternate sources of funding, such as bond markets, many African nations may struggle to finance urgent needs (Dafe, Essers, & Volz, 2018).

Bond markets may have a higher impact on African economic growth than stock markets since fixed securities are issued by firms and governments, whereas equities

are issued solely by corporations. Bond markets may therefore attract more participants than stock markets. Furthermore, bond markets have historically provided longer-term and less volatile money than stock markets, which is critical for Africa to meet its long-term financing needs. Furthermore, bond markets promote transparency, which is more beneficial to the growth of African economies than the rent-seeking actions normally carried out by banks (Andani, & Al-hassan, 2012).

A well-functioning financial market is a critical factor in a country's economic growth and development. It encourages a strong market-oriented economy with a strong financial system that is resilient to external shocks and has improved integration into international markets. Countries that want to reach this milestone must strengthen domestic debt markets, particularly the bond market, with an emphasis on diversifying investor bases, activating the secondary market, achieving trustworthy custody and settlement systems, and improving effective regulation (Oke, Dada & Aremo, 2021).

The growth of a bond market is one of the primary goals of any developing country in the world, including Kenya. This suggests that any government seeking fiscal independence must put in place intentional measures to develop a money market and encourage bond market growth (African Development Bank, 2009). Initiatives to enhance Kenyan bond markets should focus on important aspects such as maintaining a stable macroeconomic climate to enhance corporate governance; strengthening the regulatory framework; simplifying tax treatment; expanding the investor base; and supporting the creation of local bond market centers (Timmer, 2018).

1.1.3 Macro Economic Variables and Growth of Bond Market

Macroeconomic indicators and the growth of the bond market change over time as they become more apparent during periods of disruption and across occurrences. The bond market's relationship with macroeconomic indicators is more clearly established in East Asian and developing countries than in the most developed economies like the US. The degree of volatility in macroeconomic indicators is what

determines the fluctuation in the relationship between macroeconomic factors and bond market growth (Boukhatem, Ftiti, & Sahut, 2021)

Beneish, Miller, and Yohn (2015) evaluated the extent to which countries can attract international investors to their domestic debt markets in both developing and developed countries. The researchers mentioned that, the absence of such foreign investors makes countries run the currency mismatches risks, and thereby painful crises. On the other hand, Ayala, Nedeljkovic, and Saborowski (2016) argues that foreign participation in US bond markets has kept interest rates at low levels despite low savings rates. They suggest that countries may increase foreign investment by complying with the law and minimizing macroeconomic volatility.

Most African nations' bond markets are underdeveloped because of improper laws, a lack of long-term money, unpredictable demand, and unstable macroeconomic factors (Kowalewski, & Pisany, 2019). Hassan et al. (2020) highlighted a focus on the need for government regulation to safeguard both domestic and international investors and on the need for regular publication of reports on the bond market that include details on debt securities and the money market. According to Aydoan and Vardar (2020), the bond market is uncertain as a result of the fluctuating exchange rate, substantial shock, and financial constraints.

Inadequate market infrastructure and regulations, a small pool of investors, capital gains and other sources of debt financing, illiquid assets on the secondary market, and an unstable macroeconomic environment are all major obstacles to the growth of Bangladesh's bond market (Smaoui, Grandes & Akindele, 2017). Again, Mortaza & Shadat (2016) addressed the issues of high issuing fees, high trading costs, high interest rates on government borrowing and saving, and the lack of other financial instruments as barriers to the development of Bangladesh's bond market.

In Latin America, the proportion of fixed rate securities is the smallest. This is a notice of macroeconomic instability that the past has led to significant, frequent, and unpredictable changes in interest rates or exchange rates Only Colombia has been able to maintain macroeconomic stability and issue more fixed rate bonds which has issued approximately 90% of its debt inflation-indexed (Coutinho, & Tsani, 2021).

The largest borrowers globally, have specifically attempted to increase the amount of fixed rate debt in their debt management strategy. For instance, Mexico expanded the proportion of fixed rate instruments, issuing 10-year bonds among other things (Christensen, Fischer & Shultz, 2021).

Lee (2012) addressed the fact that investors in the capital market frequently take default risk and loss variables into consideration. Bond spreads are also influenced by company level risk, recovery value, and default risk. Bhattacharyay (2013) discussed how the bond market and diverse financing at the business level support an economic growth during times of financial crisis. Additionally, the bond market improves the nation's financial efficiency (Aman, Naim, & Isa, 2019). Bond markets can also entice foreign investment to lower investment uncertainty, build financial infrastructure for the nation, and turn savings into investments to recover from the economic crisis (Burger & Warnock, 2007).

It appears that Sub-Saharan African countries have minimal influence over their market borrowing costs, based on the reputation of factors in a country that reflect the quality of macroeconomic management and economic performance. Despite being a viable source of capital, African bond markets remain mostly undervalued. Inflation, exchange rates, and GDP were found to have significant impact on Eurobond performance in Sub-Saharan Africa. (Senga, Cassimon & Essers, 2018).

The majority of studies have focused on the impact of macroeconomic factors as well as the volatile environments in which African markets operate. Macroeconomic factors such as inflation rate, domestic and external debts, GDP at purchasing power parity, and fiscal balance are considered viable macroeconomic factors of autonomous bond market growth in African emerging economies. For a country to attain a robust bond market, the government should ensure external debt is set at sustainable levels and the rate of inflation must be kept low and stable (Ahwireng-Obeng, 2019).

Since international investor engagement improves bond market liquidity in South Africa, authorities should relax restrictions on foreign investor activity to increase liquidity in this important market. The bond market's growth rate in South Africa has

been inconsistent over the years. The importance of bond market growth to the country's financial system and economy cannot be overstated, since it contributes significantly to economic development (Kapingura, 2015).

Bond market growth and macroeconomic variables are closely linked as financial markets become more liberal (Kirui, Wawire, & Onono, 2014). Macroeconomic factors define the state of the economy that investors must examine and forecast in order to make investment decisions and they are thought to have the greatest impact on bond market growth (Junkin, 2012). According to this viewpoint, the study is governed by a variety of major macroeconomic indicators, including the gross domestic product, the interest rate, the exchange rate, the money supply, and the inflation rate (Crowley, 2007).

Macroeconomic variables together with banking sector development are strong factors that spur bond market growth in a country. It also acts as promoters of growth in the bond market and that strict monetary policies should be observed to control their effects on the bond market's growth.   (Nkwede, 2020). Macroeconomic variables and financial deepening have a negative and considerable impact on bond market capitalization, indicating that they are powerful macroeconomic influencers of the market growth (Hongmei, 2021).

A stable government, effective fiscal and monetary policy, efficient and effective regulatory processes for significant tax collection, and a liberalized financial system are some of the foundational elements of a nation's strong and effective bond market growth (Hossain, 2012). Misiri et al. (2018) discussed certain prerequisite components for the development of a nation's bond market. The prerequisites include a market that is operating efficiently, opportunities for investors that are appropriate, a diverse group of intermediaries, market infrastructure, monetary policies, a mechanism for managing risks, market participants, and a macroeconomic climate that is stable.

1.1.4 Bond Market in Kenya

The bond market refers to a market where trading of debt securities takes place. Debt securities in the bond market are issued by either government or corporate entities. The bond market is another method of obtaining funding resources for both the public and private sectors in order to finance long-term projects and the government deficit. The bond market plays a vital role in developing financial markets. Since the bond market has a significant impact on the economy and monetary system, as well as the various benefits it provides, the growth of a local bond market is more important to a country (Ngugi & Agoti, 2009).

In the Kenyan bond market, we have two kinds of bonds that are issued: government and corporate bonds. Kenya issues Treasury bills and Treasury bonds. Treasury bills are short-term government securities that have a maturity of one year or less. Treasury bonds are medium to long term government securities that have a fixed interest rate over their lifetime. The government issues these bonds to raise money in local currency. Treasury bonds and treasury bills are important components of the financial system in a country and the Central Bank Kenya sells these securities (Mu, Stotsky & Phelps 2013).

The Kenyan government had issued 67 government bonds by December 2020. In the same period, the Nairobi Securities Exchange issued 24 corporate bonds and notes. Government bonds have a maturity period of 1–30 years, and for corporate bonds, the maturity period ranges between 1 and 10 years. The listed government bonds usually bear a fixed coupon rate of interest of 6–14%. The classes of corporate bonds that can be issued include fixed or floating, or secured and unsecured (Bhattacharyay, 2011).

The Kenyan bond market continues to experience erratic growth when compared to other financial markets in the country, such as real estate and the stock market. Kenya's real estate sector has experienced exponential growth, as shown by the rise in its percentage of GDP from 10.5 percent in 2001 to 12.6 percent in 2012, 13.8 percent in 2016, and 20 percent in 2020. The relative continuous variation of the Kenyan equities market grew from 4% in 2001 to 15% in 2006, then to 9% in 2010,

then to 14% in 2019 and 18.4% in 2020. According to research, the growth of the Kenyan bond market has varied throughout time, rising from 2% in 2001 to 22% in 2012, 8% in 2016, and 5% in 2020 (Kenya National Bureau of Statistics, 2020).

In the early 1980s, government bonds were initially presented to the market, but this market still faces a number of challenges that limit its growth. Because the maturities of government bonds were shorter in 2001, the government made a concerted determination to shift domestic debt to long-term instruments. Since November 1996, when corporate bonds were first issued, the growth rate since then has not been maintained. There are a few corporate bonds listed in the market (Oello, 2018).

Table 1.2 presents the growth of the Kenyan bond market compared to the growth of other bond markets in Ethiopia, West Africa (Cameroon), and North Africa (Tunisia). According to the recorded data from 2001 to 2020, the Kenyan bond market is still unpredictable compared to other African markets. The growth in the Kenyan bond market demonstrates that the country is still far from developing this market. This shows that investors in this industry need more information to make informed investment decisions.

Table 1.2: Summary of Growth Rates of the Bond Markets

Year	Between 2001-2010	Between 2001-2010
Ethiopian bond market	29%	25%,
Cameroon bond market	27%	30%
Tunisia's bond market	18%	25%
Kenyan bond market	5%	7%

(CBK report, 2020; CMA Quarterly report 2020)

1.2 Statement of the Problem

Bond market growth, is an important component of an economy's and financial system's performance which is the ultimate goal of the world's economies. Growth of financial markets in general and the bond market in particular is critical in ensuring liquidity and valuation of securities. The feasibility of the bond market in mobilizing

foreign and domestic funds for investment is one of the essential functions of a well-operating financial marketplace in economic growth (Mishkin & Eakins, 2019). Bond markets plays an important role in financing both the government and the private sector trading in the market since it provides a greater opportunity to increase revenue and profitability. It also provides a new source of capital available for long-term investments and has lower cost of capital. It reduces the sensitivity of the economy to any crises and provides portfolio investment opportunities (Kemboi & Tarus, 2012).

Kenya's bond market is unable to sustain long-term projects, necessitating the government to continue looking for other sources of funding, from the external market, indicating that our bond market is far from adequate to attract corporate and individual investors from abroad and the region. Therefore, growth of bond market is essential in sustaining the objectives of liquidity and valuation of the securities.

The growth of Kenyan bond market is unpredictable compared to other African bond markets for example Ethiopia, Cameroon, North Africa and Tunisia. According to recorded data from 2001 to 2020 as evidenced in table 1.2. The rate of growth in the Kenyan bond market demonstrates that the Country is still far from developing this market. Investors in this industry need more information to make informed investment decisions.

In the absence of macroeconomic stability, both domestic and foreign investors would abstain from investing, and resources will be directed in other directions as evidenced from recorded data in table 1.1 all the macroeconomic variables under study are unstable, resulting to unforeseeable growth rate in the Kenyan bond market (World Bank, 2018).

The Kenyan bond market, when compared to other financial markets in the country such as real estate and the stock market, indicates that it is far from developing. Kenya's real estate sector has experienced exponential growth, as shown by the rise in its percentage of GDP from 10.5 percent in 2001 to 12.6 percent in 2012, 13.8 percent in 2016, and 20 percent in 2020 (World Bank, 2020).

The relative continuous variation of the Kenyan equity market grew from 4% in 2001 to 15% in 2006, then to 9% in 2010, then to 14% in 2019 and 18.4% in 2020. According to world bank report, the growth rate of the Kenyan bond market has varied throughout time, rising from 2% in 2001 to 22% in 2012, 8% in 2016, and 5% in 2020 (World Bank, 2020).

Most studies reviewed from Kenya and other countries worldwide, such as Githinji (2013), Nkwede (2017) and Bhattacharyay (2013), tend to focus largely on the relationship between macroeconomic variables and bond market development. These studies, among other studies in Africa and all over the world, have returned contradictory findings. It is crucial that studies examine various combinations of many more macroeconomic variables, as results may vary depending on the sets of variables examined.

Despite this critical importance, it is still not clear how macroeconomic variables influence the growth of bond market. This is because theoretical, empirical and conceptual literature arrive at confounding conclusions as to this interrelationship. There is no clear information on the recommended macroeconomic variables that have the greatest impact on bond market growth. The purpose of this study, therefore, was to bridge this knowledge gap by examining the moderating influence of diaspora remittance on the relationship between macroeconomic variables and the growth of bond markets in Kenya.

1.3 Objectives of the Study

The study was guided by general and specific objectives.

1.3.1 General Objective

The general objective of the study was to investigate macroeconomic variables and the growth of bond market in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were**:**

1. To assess the effect of inflation rates on the growth of bond market in Kenya.
2. To examine the effect of interest rates on the growth of bond market in Kenya.
3. To establish the effect of exchange rates on the growth of bond market in Kenya.
4. To determine the effect of gross domestic product on the growth of bond market in Kenya.
5. To evaluate the moderating effect of diaspora remittance on the relationship between macroeconomic variables and the growth of bond market in Kenya.

1.4 Hypotheses of the Study

In line with specific objectives, the following propositions were intended to guide the statistical analyses of the research data.

H_{01}: Inflation rate has no significant effect on growth of bond market in Kenya.

H_{02}: Interest rate has no significant effect on growth of bond market in Kenya.

H_{03}: Exchange rate has no significant effect on growth of bond market in Kenya.

H_{04}: Gross domestic product has no significant effect on growth of bond market in Kenya.

H_{05}: Diaspora remittance has no significant moderating effect on the relationship between macroeconomic variables and growth of bond market in Kenya.

1.5 Significance of the Study

The following stakeholders are likely to benefit from this study:

1.5.1 Regulator and Policy Makers

The policy and regulatory frameworks that are utilized to support economic stability and growth in the economy rely heavily on macroeconomic variables (Arestis, 2022).

The study findings would guide policy formulation in the bond market for better growth rates. The capital market authority acts as a policymaker, ensuring that the strategies they develop are widely adopted and strengthening bond market regulation. Thus, this study helps the regulator identify key factors to target and encourage growth in this industry through collective investment schemes. An understanding of the growth in the bond market assists the government and institutions in formulating new issuances and influences the decisions of issuers on the optimal capital structure.

1.5.2 Investors

The study's findings would useful to both current and prospective investors in considering the factors that impact their investments and the growth of the Kenyan bond market. As a result, bond market investors would be able to forecast future bond market trends, which allows them to determine where and when to invest in Kenya's bond market. This also enables them to make pertinent investment decisions.

Among the factors that influence decisions made by investors are changes in macroeconomic variables. Thus, the study endeavors to elucidate the ways in which prospective investment opportunities and the ways in which variables of the macro environment influence decisions on investment. The study findings would be a useful guide to investors for making sound legal investment decisions with regard to the growth in bond markets. Furthermore, the study would useful to bond issuers who are keen on reducing the cost of borrowing.

1.5.3 Investment Firms

Businesses' management is in charge of allocating capital to maximize shareholder wealth. This study will benefit them because it will show them how changes in macroeconomic factors will affect the financing decisions they make. Owners of investment firms who want to maximize their wealth would benefit greatly from understanding how macroeconomic variables can affect their noble goal.

1.5.4 Researchers and Scholars

The study adds a valuable contribution to the body of knowledge already in existence and practice by identifying the knowledge gap that exists in theory and forming a basis for further research. Additionally, the study creates a forum for further analysis and discussion of various macroeconomic variables and their relationships to bond market growth. This shows that the study will be valuable to the scholars in their assignments and researchers for further research.

This study would be used as a reference material for future research on similar segments of the bond market, particularly on the growth of the markets. It provides crucial information for future researchers who may seek to duplicate the study in frontier areas due to common market characteristics. The study is also likely to increase the literature and research on this type of investment. Scholars and academicians may use the study's findings as a foundation for future research in this and related fields.

1.6 Scope of the Study

The study focused on the effects of macroeconomic variables on Kenyan bond market growth. Based on the empirical literature, the study chose four macroeconomic variables: inflation rate, interest rate, exchange rate, and GDP. Secondary data from the Central Bank of Kenya, the Kenya National Bureau of Statistics, and the Nairobi Securities Exchange were used in the study. The research was conducted over a 20-year span, from 2001 to 2020. Additionally, a 20-year period assures relatively more reliable findings for a time series study, and this is in agreement with Shrestha & Bhatta (2018), who affirmed that as the time series period lengthens, the better the data for obtaining reliable results.

1.7 Limitations of the Study

The thesis examined the impact of macroeconomic variables on bond market growth in Kenya as well as the moderating effect of diaspora remittances on the relationship between macroeconomic variables and bond market growth. The study made a

number of findings which form part of the recommendation to policymakers. However, during the course of the study, a number of limitations were encountered.

The findings in this study were limited to only four macroeconomic variables investigated. The scope of this study was limited to the analysis of the bond market in Kenya. Different emerging countries' bond markets may be unique in this area, making generalizations worthless. As a result, the findings of this study were limited to the context of developing countries.

Due to various political and social events that occurred during the study period, the social-political environment changed from time to time. These events were not economic in nature, but they had a significant impact on the variables used in this study. One of these events was the 2008 post-election violence, which had a significant impact on bond market trading. As a result, the study's findings are limited by the potential effects of such social and political events on study variables.

The study had access to a number of methods for measuring the growth of the bond market and diaspora remittances. The study used bond market value as a measure of bond market growth and remittance value as a measure of diaspora remittance. This omitted other methods that could generate different results. This study used time series regression model and the Granger causality tests. Methods such as VAR and OLS, which were used in similar studies, may have resulted in different outcomes. As a result, the findings of this study are limited to the only methodologies employed in data analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the theoretical and empirical literature on the impact of macroeconomic variables on the growth of Kenya's bond market. The role of diaspora remittances as a moderator in the relationship was also investigated. The conceptual framework of the study, highlighting the relationship between the variables under consideration and how they relate to one another, was examined in the second part of this chapter. Part three assessed empirical research on the relationship between macroeconomics, diaspora remittances, and bond market growth. Finally, the study provides a review of the current literature as well as a discussion of the study's research gap.

2.2 Theoretical Framework

The major goal of the theoretical framework was to give an overview and description of hypotheses that explain the initial relationship between study variables. The theoretical framework supports various theories adopted in a research study (Kothari, 2020). Theorists formulate these theories with the main objective of predicting, explaining, and understanding the phenomena. Theories used in a study help in challenging and extending the current knowledge within the preview of the critical predictable assumptions (Johnson, & Whittington et al., 2020). Theoretical literature focuses on theories proposed to offer insight on the relationship between diaspora remittance, macroeconomic indicators and the growth of the bond market in Kenya.

2.2.1 Money Illusion Theory.

Money illusion and inflationary theory is generally believed to be first coined by Irving Fisher who devoted an entire book to the subject and later became strongly associated with Keynes' general theory by John Maynard Keynes, a British economist Fisher (1928). The theory states that people tend to view their wealth

and income in nominal dollar terms rather than recognize their true value, adjusted for inflation (Modigliani & Cohn, 1979).

Money illusion, however, is a significant feature of financial markets, indicating the inherent discrepancies in the process of evaluating financial assets (Bekaert & Engstrom, 2010). The real effect of inflation, according to Modigliani and Cohn (1970), is generated by the money illusion. People have a tendency to see their wealth and income in nominal money unit terms rather than in real terms, according to an economic theory. Money illusion, according to Fisher (1928), was a significant influence in business-cycle swings. To put it another way, it is considered that people do not consider the amount of inflation in an economy, erroneously assuming that the money value is the same as the previous year (Heo, 2019).

Later, Modigliani and Cohn (1979) developed the idea by assuming that the inflation illusion is caused by enormous correlations between inflation and bond market returns. Rising prices during an upsurge, according to Fisher (1922), would promote investment demand and encourage businesses to borrow more, resulting to rise in nominal rate of interest. Lenders would accommodate them by boosting their savings in reaction to the rise of the nominal interest rates, ignoring the fact that the real interest rate had not risen but had actually declined due to the rise in inflation.

The inflation illusion states that when predicted inflation rises, the bond's yield rises as well. Bond investors discount actual cash flows erroneously using nominal rates, which results in bond mispricing as nominal yields rise (Bekaert & Engstrom, 2010). The term "money illusion" refers to the inability to tell whether a unit of money is increasing or decreasing in value (Irving Fisher, 1928). It can also be used to describe any inability to tell the difference between monetary and real magnitudes (Hsu, 2022). Theorists are misled by abstracts from money illusions into believing in a perfect world of effective financial markets, ignoring asset markets' inherent financial insecurity

According to Ion and Wang (2009), while the inflation illusion explains the degree of bond mispricing however, it does not explain the volatility of mispricing. Investors in bond market are unaware to the impact of inflation on the bond market's growth rate,

and they extrapolate historical bond growth rates even during periods of fluctuating inflation (Campbell & Voulteencho, 2004). This allows the economic sectors of real commodities and services to be separated from those of their monetary valuation, such as asset markets.

However, money illusion is a necessary component of financial markets, particularly the bond market, because it simply reflects inherent inconsistencies in the valuation process of financial market assets. Theoretical economists are misled by the money illusion into believing in an ideal world of efficient financial markets, ignoring the inherent financial instability of financial market (Hsu, 2022).

As a result, during the periods of high or low inflation, the equity premium rationality anticipation exceeds the subjective expectation of the market and the bond market is undervalued or overvalued. Because the stakes in the bond market are obviously quite high, the idea that investors in bond market suffer from money illusion is both fascinating and contentious. During an upswing, rising prices would drive investment demand and encourage businesses to borrow more, resulting to increase in nominal rate of interest (Celiktas & Yilmaz, 2021).

2.2.2 Liquidity Preference Theory

The theory of Liquidity preference was first proposed by John Maynard Keynes (1936) to explain how the money supply and demand determine the rate of interest. The theory propositions that investor should expect a higher rate of interest or premium on assets having longer maturity time and higher risk. All other conditions being equal, investors have cash preference or other highly liquid holdings (Bibow, 2013).

Liquidity preference theory states that short-term interest rate charges are lower than medium- and long-term interest charges, since investors are not willing to risk liquidity over longer time periods. Investors prefer to pay higher premiums for medium and long-term securities than for short-term securities. More costs of living mean higher need for cash or liquidity to meet those day-to-day demands. Keynes

defined the concept in terms of three factors that influence the demand for liquidity (Keynes & Waeger, 1936).

Furthermore, market investors, according to Keynes, always prefer liquid assets over illiquid assets. Liquidity is a measure to the ease with which an asset, or security, can be transformed into immediate monies without affecting its market price. Investors are prepared to pay a premium for liquid assets and will want to pay a lower price for illiquid assets. Long-term bonds receive higher interest rates because they are illiquid, as opposed to short-term bonds, which are liquid (Asensio, 2017).

Short term securities linked with greater liquidity are preferred by the majority of investors to invest in-rather than long term bonds due to greater risk. Such investors will often require an enticement, normally in form of a liquidity premium to hold securities that are long term and are often associated with a lower degree of liquidity (Reilly & Brown, 2011).

Investors like liquid assets and are willing to pay high price for liquidity. They would otherwise pay less for illiquid securities than market value. This may be seen in bond yield pricing, where bonds with a longer maturity term pay higher interest rates than those with a shorter maturity period, with the goal of enticing investors to acquire the less liquid and riskier assets (Cardim de Carvalho, 2010).

The theory has an assumption that long-dated premium bonds are more difficult for trade or sale in the market than short dated bonds. This theory further infers that the yield curve will have an upward bias because investors prefer the greater certainty of short-term gilts, which are less volatile than long dated gilts, as the greater the volatility, the lower the coupon and the longer the redemption date (Curry, 1995).

The concept of liquidity preference is thought to be most applicable in industrialized economies, where the money market is large and well-organized, and consumers choose between different types of securities in speculative markets. As a result, it is inapplicable in backward developing economies with restricted asset options. Furthermore, other significant elements such as the rate of saving, the desire to consume, and also the marginal efficiency of capital influence and are influenced by

the rate of interest, which the liquidity preference theory totally accepts (Ogiriki & Andabai, 2014).

This theory fails to explain why different interest rates exist in the market at the same time. Several people keep cash on hand as a reserve for liquidity and to invest in the bond market. This theory completely ignores the situation in which some funds benefit from interest while others benefit from liquidity. Furthermore, the liquidity preference theory only explains short-run interest rates and offers no insight into long-term interest rates (Kregel, 2019).

The Keynes theorem constrained the liquidity preference idea unnecessarily by simplifying the contrast between liquidity and illiquidity and neglecting the complex system of interest rates that depend on the degree of liquidity difference. In practice, different degrees of liquidity exist over time. To put it another way, it completely neglected the time factor. The contrast between liquidity and illiquidity is not as straightforward as Keynes believed. As a result, his hypothesis of a unified (uniform) liquidity system is unacceptably weak (Vestergaard & Gabor, 2021).

Despite its many limitations, the liquidity preference theory can be used to quantify the effect of money demand and supply on interest rates. The liquidity preference theory is useful in determining the impacts of money supply and demand on interest rates. It demonstrates the link among people's motivations, income, and rate of interest according to Keynes (2010). It also claims that monetary policy is ineffective in the economy due to a liquidity trap that existed throughout the recession. At the same time, we must recognize and evaluate the fact that liquidity is not the only factor influencing the money supply or interest rates. Before making a selection, there are other aspects to consider (Eyerci, 2021).

An assessment of Keynesian theory in light of the current study reveals that rising government deficits and corporate need for greater capital may result in an upsurge in the rate of interest. Perhaps this is due to the fact that rising interest rates raise the cost of borrowing money. As a result, the government and enterprises must pay a higher interest rate on borrowed cash raised through bond issuance. As a result, as interest rates rise, the demand for loanable funds rises as well, lowering the price of

bonds. In other words, interest rate fluctuations have an impact on bond yields (Orsota, 2004).

Studying bond market liquidity is critical in today's academic world as well as in terms of practical utility. Because of the liquidity premium that is inherent in bond prices, market liquidity has impact on growth of bond market. Also, it introduces the additional liquidity premium rate, which is the rate that investors seek to maintain long-period securities with lower volatility. (Amihud, Menelson & Perden, 2006). As a result of this idea, a bond market investor will prefer to buy short-term bonds, which are liquid and less hazardous, over long-term bonds, which are illiquid and risky. This is why bond investors prefer bonds with a set maturity date over alternatives.

2.2.3 Purchasing Power Parity Theory

Cassel (1918) coined the phrase, buying power parity, and Professor Gustav Cassel proposed the purchasing power parity hypothesis in Sweden in 1916. Purchasing power parity (PPP) is an economic theory for determining exchange rates that assumes that the price levels of two countries should be equal. This means that once the currencies have been swapped, commodities in each country will cost the same (Papell & Prodan, 2020).

The purchasing power parity theory is another name for the inflationary theory of exchange rates. It is a theory for determining exchange rates as well as a method for comparing the average costs of services and goods between countries. This hypothesis was based on the law of one price which holds that if appropriate taxes and transport costs are removed, equivalent prices should be assigned to indefinite items in two distinct markets, making both markets efficient (Kiilu, 2018).

Purchasing Power Parity theorem explains the association between relative values of items and exchange rates. According to Purchasing Power Parity theory, changes in relative pricing between two countries might result in a difference in exchange rates between their currencies over time. The theory is about the rate of exchange between

two countries, which is determined by the purchasing power of the two currencies in comparison (Ang, Thum & Sek, 2021).

It is a neoclassical economic theory that states that exchange rate between two currencies on foreign exchange market is the one used in purchasing power parity comparisons, meaning that the same number of products may be purchased in either currency. It also enables economists to compare economic production and living standards across nations (Ruiz-Nápoles, 2018).

This theory (PPP) is a prominent macroeconomic statistic that compares the currencies of different countries using a basket of commodities approach. In a floating exchange rate system, the PPP theorem asserts that a change in purchasing power parity, defined as the price ratio of traded items, will have a tendency to be approximated by variation in the equilibrium exchange rate between these two currencies (Kiilu, 2018).

PPP has a long-standing shortcoming that gives the impression that exchange rates are fairly stable over time. On the other hand, market rates are more variable, and utilizing them can cause considerable changes in aggregate growth projections even if individual country growth rates remain steady. The idea is hampered by the inability to select an adequate price index for pricing calculations. It does not take into account the effects of international capital flows (Gyamfi, & Appiah, 2019).

This theory's limitation is that, it shows a direct relationship between purchasing power and the exchange rate while ignoring many other factors such as exports and imports. Changes in price levels cause fluctuations in exchange rates. Changes in national pricing reflect changes in relative nominal price levels across countries. (Ruiz-Nápoles, 2018).

Given that corporations listed on the bond market import some products from outside that are made outside of the country and paid in foreign currency, this idea is important in this study. This has an effect on their performance, which may also have an effect on the growth of the bond market. Finally, the exchange rate has effects on

international investors active in the bond market which may have some impacts on the bond market growth (Pamu, 2011).

2.2.4 Pure Self Interest Theory

Pure Self-Interest Theory was proposed by Lukas and Stark (1985). It argues that remittances from the diaspora are not always related to economic situations in the receiving country. According to Smith (2010), the theory argues that some migrant sends remittances home with the hope of inheriting or making future investments, with the intention of returning home to earn profit from those investments. Emigrants send money home in the hopes of being rewarded for their kindness by their relatives when they return (Tabit, & Moussir, 2016).

In some cases, or circumstances, remittance volumes are lowered as a result of the recipient country having poor economic conditions. In this situation, there exist no negative association among the volume of remittance and the performance of economic condition of mother country (Brown, 2006). In reality, there may be positive relationship amongst remittance volumes and the economic performance of the mother country, with low remittance volumes resulting from poor economic conditions. The Pure Self Interest theory was developed as a result of such behavioral tendencies (Reilly & Brown, 2011).

According to Lucas and Stark (1985), remittances might also be motivated by migrants' self-interest. Migrants send money to their home land so as to invest in or inherit assets, as well as to return home with dignity. Migrants are more likely to send less money home when their native country's economy suffers. If the domestic economy is doing well, the volume of remittances is likely to increase (Biyase, 2018).

The argument behind the Pure Self Interest hypothesis is that remittances are not always countercyclical. According to the notion, the expansion of the bond market is linked to diaspora remittances. When economic conditions are good, remittances rise, boosting the bond market's growth rate. If economic conditions are unfavorable, remittances will fall and the bond market's growth pace will decline (Belal, 2010).

Remitting monies from a foreign country to a domestic country is primarily intended to develop assets that will yield future profits when the remitter returns home. As a result, remittances serve as a long-term investment plan (Osoro, 2020).

The criticism of this theory is that individuals are aware of or determine that their current interests and future interests are distinct. A person gains knowledge of the things that will satisfy their current interests through direct experience with those things. Only through imagination can one comprehend what another person finds similarly interesting. The distinction between self-interested and other-interested action then ceases to be as obvious and clear as the embedded ideas about self-interest assume (Muguna, 2018).

The Kenyan government recognizes the enormous contribution and untapped potential of Kenyans residing abroad through its foreign investment policy (Vacaflores, 2018). The diaspora diplomacy pillar attempts to tap into Kenyans in the diaspora's talents, knowledge, expertise, and resources to help them integrate into the national development agenda (Ambrosetti, Cela, & Fokkema, 2011).

2.2.5 Endogenous Growth Theory

Endogenous growth theory was proposed by economist Paul Romer in 1986, who argued that increased productivity can be directly linked to faster innovation and additional investments in human capital by public and private institutions (Manuelli & Seshadri, 2014). Policy decisions, according to the endogenous growth theory, can influence an economy's long-run growth rate. It asserts that endogenous, or internal, factors, rather than external factors, drive economic growth and investment. In contrast to a neoclassical growth model, an endogenous growth model determines the long-run rate of growth based on variables within the model rather than the exogenous rate of scientific advancement (Thach, 2020).

The theory advances that economic growth is caused by inner economic variables rather than outside ones. The hypothesis assumes that advancements in innovation, knowledge, and human capital lead to increased productivity, which enhances

economic growth. It contends that government and private-sector investments in human capital are directly linked to higher productivity (Akram, 2011).

The long-run rate of a country's economic growth is thought to be influenced by government policy initiatives in Endogenous Growth Theory. Endogenous Growth Theory assumes that aggregate production functions have non-decreasing returns to scale, which provides a link between public policies and long-run growth (Atique, & Malik, 2012). Exogenous growth theory is frequently chastised for relying on assumptions that are difficult to assess, and there is no empirical data to back up the theory.

In an endogenous growth model, Eta and Anabori (2015) discovered that the economic development has three effects on growth: increasing the social marginal productivity of capital, improving the efficiency of financial intermediation, and influencing the private savings rate. Jianheng (2013) went on to say that the endogenous growth model emphasizes technical development as a result, financial organization will influence financial growth by effectively performing its functions, which include loan establishment (Ahwireng-Obeng, 2016).

Some may claim that the distinction between physical capital and human capital is obscured in some endogenous growth models. Others may argue that the endogenous growth theory ignores the function of organizations and puts too much emphasis on human capital, despite the fact that human capital and labor investment are important contributors to economic growth (Manuelli & Seshadri, 2014).

Endogenous growth theory has been criticized for lacking empirical support. It is not a supported model because there is no empirical provision for it. The theory has been levied with being based entirely on unproven assumptions. Additionally, it distinguishes between internal and external factors when analyzing physical and human capital. However, some critiques argue that these two forces are identical (Akram, 2011).

For many African countries, generating adequate domestic income to support economic expansion has been a significant challenge and foreign capital has been used to supplement domestically generated resources in order to finance growth for decades. In theory, domestic bond markets should allow African states to obtain long-term debt in their own currency to fund development needs (Peiris, 2010).

According to the endogenous theory, productivity gains are directly linked to speedier innovation and increased expenditures in human capital by governments and private sector institutions. As a result, this hypothesis is critical in this study context because either the state of the economy has a negative or positive impact on bond market investor decisions, which in turn affects the bond market's growth rate

2.3 Conceptual Framework

Conceptual framework illustrates what the research project anticipates to uncover. It identifies relevant variables and shows how they connect to one another. It graphically or narratively explains the study's core objectives, which are the important variables and their hypothesized key link (Kothari, 2020). A conceptual framework's major goal is to provide a better grasp of the study's concepts and to indicate probable linkages between them. This was utilized to set the stage for interpreting the findings of the investigation (Saldana, Miles & Huberman, 2014).

The effect of macroeconomic factors on the growth of Kenya's bond markets was explored in the study. Independent variables of the study were; interest rate, exchange rate, inflation rate, and gross domestic product. Whereas diaspora remittance was a moderating variable. Depending on the situation, some independent variables may have a negative influence on growth of bond market, while others may have a beneficial impact. The relationship is represented in the conceptual framework below.

```
┌─────────────────────────────┐
│       Inflation Rate        │
│                             │
│  • Consumer Price Index.    │
│                             │
└─────────────────────────────┘
                                              ┌──────────────────────────┐
┌─────────────────────────────┐               │  Growth of Bond Market   │
│       Interest Rate         │               │                          │
│                             │               │  • Value   of   the bond │
│  • Commercial Bank          │               │    market                │
│    Lending Rate.            │               │                          │
│                             │               └──────────────────────────┘
└─────────────────────────────┘

┌─────────────────────────────┐
│       Exchange Rate         │
│                             │
│  • Kshs to US dollar        │
│                             │
└─────────────────────────────┘

┌─────────────────────────────┐    ┌──────────────────────────┐
│  Gross Domestic Product     │    │  Diaspora Remittance     │
│                             │    │  • Value of Remittance   │
│  • Income of a country      │    │                          │
│                             │    │                          │
└─────────────────────────────┘    └──────────────────────────┘
```
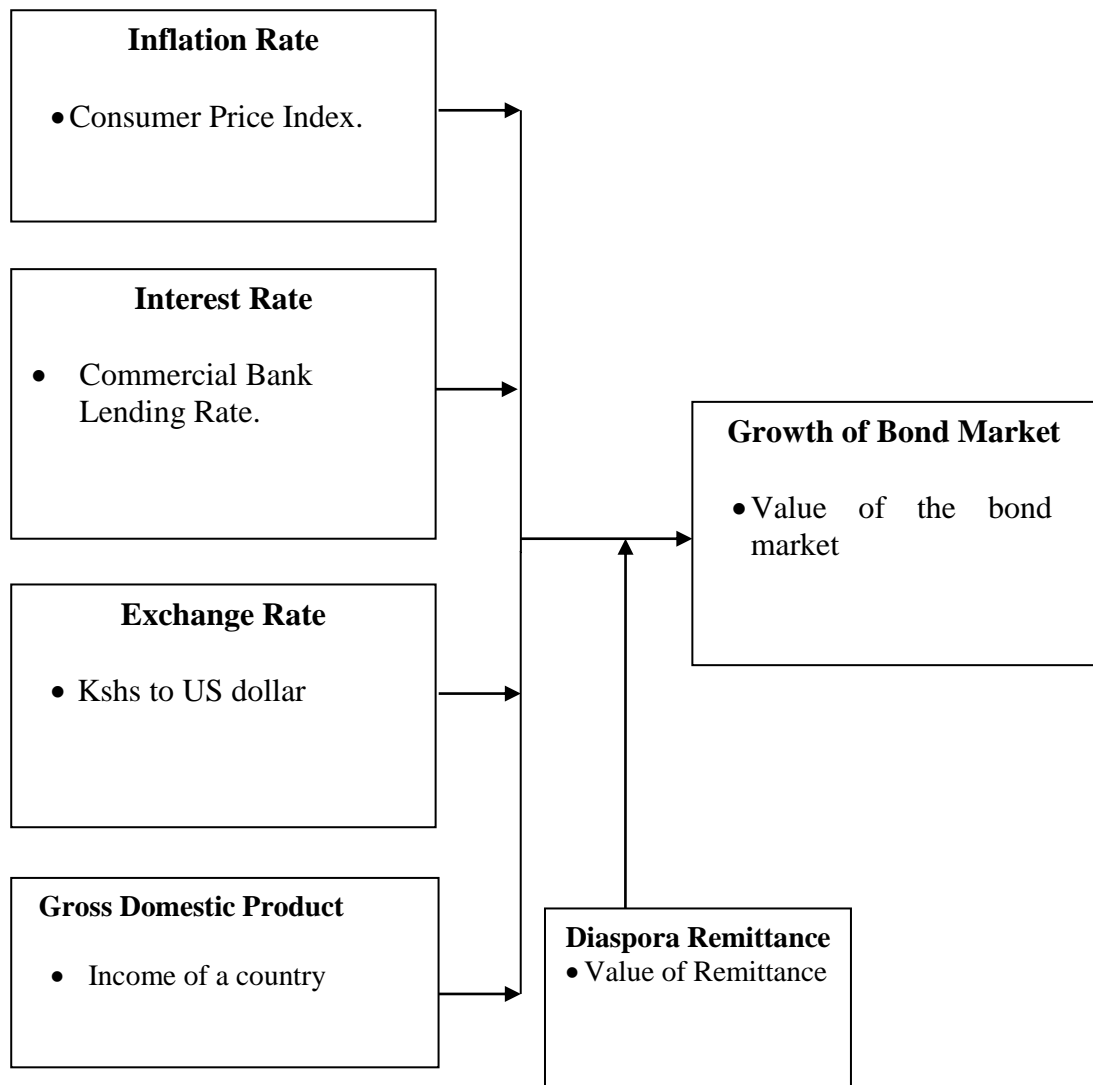
Independent Variables   **Moderating Variable**   **Dependent Variable**

Figure 2.1: Conceptual Framework

2.3.1 Inflation Rate

Inflation rate is described as a continued increase in an economy's overall price levels over specified period of time. This rate change of inflation has an important influence on the currency's purchasing power and the cost of products and services traded in the market (Kullapom & Lalita, 2010). The influence of inflation is focused in two ways; the effect on production costs and the effect on aggregate demand. Consumers with fixed incomes have little purchasing power during periods of high inflation

because the value of money decreases, resulting in a drop in market demand for products (Mukiza, 2011).

Also, inflation is defined as an increase in the cost of quantified goods and services in a predetermined and fixed consumption basket (Win, 2019). Medium or low levels of inflation in a country influence the business sector either positively or negatively (Kariuki & Kagiri, 2016). Explaining the occurrences of inflation is of great interest to central bankers, macroeconomists, and policymakers in both developed and developing countries. High inflation rates create uncertainty in the economy, and this makes investors afraid of investing in capital goods (Adhikari & Gharana, 2014).

Once inflation is high, the bond market growth can be hampered by higher input costs and lower final demand for the company's output. The effectiveness of the market environment and the nature of operations in the market determine the influence of inflation (Hussain & Malik, 2011).

Inflation may result in ambiguity concerning the long-term profitability of investment projects, particularly in a scenario where inflationary pressures are linked to increasing price volatility. This could force marketers to use more traditional investment tactics than they would otherwise, hence leading to slow investment and low economic growth. With rising inflation, asset-related risks rise, increasing the expected rate of return for investors because higher risks are associated with greater inflation uncertainty; thus, inflation and bond prices have a close relationship (Bonab, 2017).

Bonds offer a fixed rate of return, and a rise in inflation translates into the erosion of the purchasing power of the currency which means the bond's fixed return is in effect losing value (Hagedorn, 2018). Inflation increases results to reduction in prices of bond because demand for bonds diminishes due to the diminished real returns. High inflation rates lead to rise in the price of living and this makes a change in resources from investment to consumption leading to low demand for financial instruments (Kemboi & Tarus, 2012). This consequently reduces traded volume of securities in the marketplace. (Saungweme, 2021). According to the Central Bank of Kenya, higher inflation rates curtail uptake of long-term instruments or lead to demand for

higher rates on long-term bonds, which makes mobilizing long-term funds to aid development unsustainable (Atiti, Agung, & Kimani, 2020).

The producer price index, the consumer price index, and weighted price index, can all have an impact on inflation measurement (Adam & Twenoboa, 2008). The Consumer Producer Index can be measured annually, monthly, or quarterly. It is the main measure of the inflation rate in Kenya and also weighted average change in retail prices paid by customers in the market for a specified basket of products and services. It is a macro-economic indicator for general economic and social analysis on which average price variation of consumer goods are measured and it is a tool used in wage and negotiation situations (Abdirizak, 2017).

Inflation in Kenya is measured by tracking the price movement of a predetermined collection of goods. The changes in price changes are calculated through re-pricing the same basket of products and services comparing aggregate costs at regular intervals to the same price of a basket in a chosen base period (Wei, 2017). The Kenya National Bureau of Statistics is in in control of gathering the price data that is needed to create the catalogues. The information is gathered through a survey of consumer products and service prices at retail. (Kenya National Bureau of Statistics, 2017). Consumer Price Index, has been used as an inflation measure in a number of studies. Unpredicted and predictable inflation rates describe the associations between inflation rates and bond market growth (Chaudhary & Xiumin 2018).

2.3.2 Interest Rate

Interest rate as a cost that balances the desire to own money as a form of wealth with the accessible quantity of capital or price of money within a given time span. It's referred to as the token paid for abstaining and the inconveniences inherent with having to part with an asset with extraordinarily high liquidity in the liquidity hypothesis. Finally, it can be said to be the cost of borrowing or lending money and it can be expressed as a monthly or annual percentage rate (Mainga, 2014).

The rate of interest is a significant macroeconomic variable that is directly linked to economic growth (Alam & Uddin, 2009). Interest rates have been long recognized as

important for economy. During periods of stable interest rates, they encourage both local and foreign investment. The opportunity cost of retaining money will rise as interest rates rise. Investors will also swap owning interest-bearing securities for bonds, affecting the value of the latter (Khan & Khan, 2018).

The primary function of interest rates is to aid within the mobilization the resources of finance to ensure that resources are efficiently utilized in the financial market promotion and development of the financial market growth. Higher interest rate reduces capital expenditure and investment in a country (Laopodis, 2009). The rate of return expected by the lenders of the money in the market is measured by prevailing Interest rate. Consequently, it should include all data on future changes in purchasing power as well as the risk undertaken in the financial market (Emamian & Mazlan, 2021).

Government policy shifts, as well as domestic and international financial market crises and inflation influence interest rates and reduce long-term economic growth prospects in a country. However, economic events like the one mentioned above are unpredictable. The business cycle refers to the economic expansions and contractions that occur over time, is linked to a more regular variability of interest rates (Zlen & Ergun, 2012). Changes in interest rates influence many economic phenomena, like the level of consumer expenditure on equipment, technology, assets, investment, expenditure on plants, and the way wealth is re-distributed between borrowers and lenders (Nelmida, 2019).

Bond performance is influenced by interest rates in the Australian bond market. The sensitivity to order flow in the Australian interest rate futures market increased immediately after a scheduled macroeconomic announcement. When the rate of interest rises, so does the rate of investment. As a result, a low interest rate is likely to increase investment activity (Smales, 2017).

This suggests that investment growth is likely to require more debt. Alternatively, in the case that short-term interest gain becomes inelastic, the chances are very high that they are unlikely to influence the level of investment. As a result, there is a link between investment and the use of debt, as well as the interest rate levels. This is

because interest rates are a representation of the cost of borrowing money over a specific time period. Due to the degree of risk aversion faced by investors, they must consider the interest rate when making investment decisions (Sigh, 2013).

Inflation and government policy affect interest rates frequently. The real interest rate reflects nominal interest rate level. The nominal interest rate level is less than the inflation rate level, in real resulting in a negative interest rate (Peer, & Baig, 2021). Domestic interest rate is a representation of what is termed as the opportunity cost of keeping money. This means that the government is more likely to prefer holding more financial assets, for example, treasury bonds and treasury bills, among others. Net interest margins provide bank interest rate spreads during times of high interest rates. This higher interest rate tends to attract foreign capital and puts pressure on the local currency (Maudos & Guevara, 2014).

This triggers the central bank to raise interest rates, further undermining real economic activity. High interest rates similarly influence the cost of financial assets for example the stocks, the bonds, and foreign currencies (Mainga, 2014). The interest rate in Kenya has oscillated depending on the country's economic situation. The market value of bonds and equities is exaggerated by fluctuations in interest rates. Bond values in the market are inversely related to long-term interest rates. As a result, if other economic variables remain constant, bond prices drop when long-term interest rates increase, and vice versa when long-term rates fall (Fabozzi & Fabozzi, 2021).

Higher interest rates lower the prices of investment securities for example the bonds. This occurs because a larger factor is used to discount future returns such that any given future income stream's present value moves down. Other factors, such as policy changes, may not be equal because they may have an indirect effect on expectations or confidence (Emamian & Mazlan, 2021).

All things may not be equal, like changes in policy, since they might have indirect effects on anticipations or confidence. People typically shift their invested cash from the bond market to interest-earning bank deposits when interest rates provided by banks to depositors rise. As a result, the demand for bonds declines, causing the price

to rise. The converse is also true; so, in theory, bond price and interest rate have an inverse relationship (Githinji, 2013).

The increase rate of a bank deposit over time may be expressed as an interest rate. Interest is generally represented in an annual percentage of the principal when it's levied or paid for the usage of money. It is determined by dividing the interest amount by the principal amount. An interest rate is a mechanism used by a country's central bank to keep any big currency movements in check. Increase in interest rates is required in order to stabilize the devaluation of the currency and reduce inflationary pressure, thereby avoiding numerous negative economic effects. (Yetman, Yetman, & Devereux, 2012).

In this case, the real difference between the average interest rate paid and the average interest rate earned on loans is a very good measure of such a spread. Therefore, in the event that the interest margin is low, the chances are very high that the social costs of financial intermediation will be at their lowest point (Cruz-Garca, Fernández de Guevara, & Maudos, 2019)

2.3.3 Exchange Rate

The cost of a country's currency in comparison to another country's currency is the foreign currency exchange rate. The prices set by supply and demand are known as exchange rates. The rate of exchange is the most important price in some countries' economies since it determines the global balance of payments. (Valchev, 2020). The market where currencies are bought and sold is known as the foreign exchange market and has great importance in the economy of the country. The change in exports and imports affects aggregate demand and the price level (Sweidan, 2013).

When it comes to the trading and investing components of a country`s economy The exchange rate plays a vital role. This means that an exchange rate has a significant positive influence on government fiscal and monetary policies, household consumption, income, firm investment, import and export decisions, debt and trade balance influence the bond market (Adelegan Radzewicz-Bak, 2009).

The investors from overseas who invest in domestic market and local investors who decide to invest in international marketplaces both benefit from the foreign exchange rate (Ndung'u, 2013). Foreigners who wish to purchase products, services, or assets usually have to pay in dollars. Foreign products must usually be purchased in a foreign currency. Financial investors in Germany, for example, purchase dollars in order to purchase US government bonds and all these transactions takes place in the foreign currency market (IMF, 2015). Exchange rate policy is one of the most effective financial policy tools.

Policy on exchange rates is considered one of the most prevailing measures of economic regulation and external sector regulation in the economy of a country. Additionally, the forex market stability goes a long way towards influencing capital flight speculation as well as market speculation on the market for foreign exchange. The central bank of Kenya is interest about a country's exchange rate because it has an impact on the quantity of supply and aggregate demand in the economy (Oberholzer, 2022).

The exchange rate fluctuates frequently and significantly, disrupting international trade and causing problems in a country's banking system. And this might lead to an unstable trade balance and massive inflows of global financial capital, putting the economy at risk of a deep recession if overseas investors opt to relocate their money to another country. As a result, changes in the exchange rate can have a big influence on export and import subsidies, as well as the economy's overall aggregate demand (Vartholomatou, Pendaraki & Tsagkanos, 2021).

People acquire a country's currency to buy products and services and to invest in its assets. To comprehend the changes in the demand and supply on the foreign exchange markets, both of these motivations must be taken into account. The exchange rate risk influences the import and export trade in a country. If the currency declines against an opposing nation, imports become more expensive compared to exports, whose prices become relatively cheaper. Such risks pose a significant hazard to any economy, and they are impacted by a variety of circumstances. The main

factors to currency rate volatility are inflation rates, commodity prices, and central bank rates (Aduda, Masila & Onsongo, 2012).

The costs at which a country trades with the rest of the world directly impacted Exchange rates making them an essential element for analysis of the open economy and policy formulation. Exchange rate strategy impacts the trade balance in a certain direction. They play a critical role in economic management as well as adjustment in emerging countries, where international competitiveness and low inflation rate have become major policy problems. External trade can be stirred through a variety of channels, including preferences, subsidies, quotas, taxes, and other means that could be utilized to push the trade balance in the right direction (Cristiano, 2019).

Foreign exchange movements have been shown to have an impact on all parts of an open economy, including its financial markets. For example, it has been demonstrated that floating exchange rate appreciation undermines export market competitiveness and has a negative impact on export-dominated economies' domestic bond markets (Charles, Darné & Kim, 2012). In effect, import-oriented nations such as Kenya can suffer from price instability when they encounter exchange rate vitality because the Kenyan economy puts more emphasis on imports of raw materials, consumer goods and capital goods, hence there is necessity to govern the foreign exchange market (Varirahartia & Marsoem, 2022).

There is no universal theory for determining exchange rates. On the other hand, can be measured in a number of ways. The five most likely domains where potential exchange rate determinants can be found are, infrastructure, parity conditions, cross-border foreign direct investment portfolio, speculation, and political risks. Currency exchange rate can be expressed in a variety of world currency units, such as US dollars, British pounds, Euros, and others (Eiteman et al., 2020)

The most popular method is to use of rate exchange among two countries, which refers to value of single currency in relation to another. Because the US dollar is the most widely traded currency in the planet, bilateral exchange rates are usually stated against it. Bilateral exchange rates are regularly publicized in the media and are noticeable in our daily lives. When consumers travel abroad or order goods and

services from other countries, they are exposed to them. Businesses come into contact with them when they buy production inputs from other nations and enter into contracts to export their goods and services to other countries (Kirui, Wawire & Onono, 2014).

The demand curve for dollars connects the rate of exchange to the number of dollars' purchasers are willing and able to acquire at any one time. If the exchange rate rises, purchasing a dollar will require more foreign currency. Due to the higher exchange rate, foreign buyers find cost of goods and services in the United States has increased thus limiting demand. This is likely to reduce the amount of money they require. The price of the dollar, often known as the exchange rate rises, foreigners desire fewer dollars. As a result, the demand curve for dollars is trending downward (Oberholzer, 2022).

The supply curve for dollars is produced using a similar methodology. To exchange USD for foreign currency, individuals and companies in the United States must first buy the currency of the country from which they wish to buy goods, services, or assets. The dollars amount accessible on the market of foreign exchange represents extent to which Americans are purchasing foreign currency at various exchange rates. When the exchange rate is greater, it means a dollar is worth more in another currency. Because the rising exchange rate makes foreign goods and services cheaper for US buyers, US consumers buy more overseas goods and services. This will increase the supply of dollars at a certain exchange rate. Consequently, the supply curve for the dollar is upward (Gokmenoglu, Eren, & Hesami, 2021).

Bond yield differentials follow the same pattern as currency pairs. This happens because capital movements are drawn to higher-yielding currencies. As one currency's exchange rate rises in relation to another, financial investors are drawn to the higher-yielding currency. Furthermore, as the bond yield difference moves in favor of the currency that is sold, the cost of owning the lower-yielding currency rises. For example, as US bond yields rise relative to Japanese bond yields, the cost of owning the Yen and selling the USD rises (Hui, Lo & Chau, 2018).

According to Miskin and Eakins (2019), the rate of exchange of a currency in which the majority of a portfolio investments are held determines the portfolio's real return values. When the rate of exchange declines, the purchasing power of income and capital gains earned from any returns is visibly reduced. The rate of exchange also affects other sources of revenue, including inflation rates, interest rates, and capital gains all from local stocks. Even though exchange rates are influenced by a host of intricate factors that confound even the most experienced economists, investors should have a fundamental knowledge of how currency values and rate of exchange affect the rate of return on their investments (Hofmann, Shim & Shin, 2020).

2.3.4 Gross Domestic Product

Gross domestic product is the total real market value of all domestically produced final goods and services in a given year. For a growing economy, higher GDP means higher income levels, which means more disposable income for individuals. As a result, since bond demand, is linked to disposable income, the demand will rise, prompting investors to purchase more bonds (Thrun, 2019).

Bond prices rise when the demand for securities rises. During slow economic times, low levels of disposable income are recorded, which has a negative impact on disposable income. Lower GDP means fewer jobs, less discretionary spending, and lower output for the majority of employees, encouraging investors to liquidate their stock holdings. This result in decreasing in the market price of securities (Babu et al., 2015).

Most global economies go through cyclic fluctuations that involve both periods of recession and boom. The demand for credit is normally high during periods of boom as compared to times when the economy is going through a recession. (Callen, 2008). The demand for credit decreases during periods when GDP growth is declining and in turn this negatively interferes with the profitability of a bank and the turnover for the bond market. However, a period of economic boom is marked by a positive and increasing GDP, which increases the demand for credit and ultimately results in growth in profitability (Ongore & Kusa, 2013).

According to Keynesian economics, changes in aggregate demand significantly affect the output prices level and employment within the short timeframe. Business cycles characterize all market economics and are formed by employment forms, interest rates, inflation and upward and downward movements in output. The macroeconomic theories of John Maynard Keynes highlighted the significance of using aggregate demand forces to determine business cycles. Changes in aggregate demand are contingent upon changes in consumer, business, or government total spending relative to the economy's productive capacity (Ogujiuba, & Cornelissen, 2020).

People of different income levels typically consume different product bundles, with the wealthier consumers trying to express a latent demand for certain new products. Because there is always a cost to producing far from demand, increasing returns to scale requires that production be largely focused in one location. The developed countries, where there is a sufficiently high representative demand for these new products, are where they are first made available (Lankhuizen, Groot & Linders, 2011).

The people with high disposable incomes show more demand for new goods compared to those with low disposable incomes. It is for this reason that new goods are mostly presented in developed nations, because there is a high demand for them in these countries (Jalaee & Nejati et al., 2017). This is due to the fact that, as returns to scale efficiency increase, manufacturing must be concentrated in a single site. Countries with low disposable incomes can only import a few product varieties from these developed economies. However, this is not possible since production cost is always higher than demand, and for this reason, such goods are only introduced to nations that can afford them (Heliati, 2019).

The bond market's growth is influenced by economic trends. Depending on how exposed bonds are to interest rate risk, the economy has a variety of effects on them. Like other types of investment, bonds are fixed to the economy since the corporations and governments that issue them exist within that economy. Slower economic growth lowers money demand since people and firms are less inclined to

take out loans to fund projects and make market bond purchases (Oke, Dada & Aremo, 2021).

Prices and interest rates fall when there is less demand for loans. As interest rates fall, Investors are becoming increasingly nervous and bonds, with their set yields, become more appealing than stocks. Apart from Treasuries, other forms of bonds gain from faster economic growth rather than being harmed by it. Typical examples of these segments are; Low-rated corporate bonds, high-yield bonds, and emerging market bonds. These bonds' bond yields are high enough that small treasury yield movements have no impact on their growth (Andrews, 2009).

The Gross Domestic Product is mostly often used as an indicator for performance of a country's economy. A significant increase in GDP signifies economic expansion, while a significant decrease suggests a downturn. The need for money either rises or falls as the economy moves upward. Because there are more products and services offered, more money is demanded (Ongore & Kusa, 2013). Since the employment rate and earnings have both increased growth, consumers may spend more. Bond market growth is a significant indicator in development of a country's economy. Bond market expansion helps to the expansion of the size, access, efficiency, and stability which are the four dimensions of the financial system (Kapingura, & Makhetha-Kosi, 2014).

The value of the gross domestic product data is immediately evaluated to analyst forecasts. If the GDP value is below or at the value anticipated, the bond market would likely react positively. Particularly this is true if the real final sales are reduced and more so if inventories are rising because of falling demands. If the economic growth in a country decrease, this will not motivate the CBK reserve to raise interest rates, and this would increase demand for market bonds, thus pushing the bond prices higher (Heliati, 2019).

Conversely, if gross domestic output exceeds expectations, the value of current bonds could fall dramatically. The report on GDP, together with rising inflation rate, would fuel assumption and doubts that the CBK Reserve level may raise interest

rates in the short-term. Fears that the CBK reserve may raise interest rates may lead bond prices to fall (Franklin Global Asset Management, 2010).

2.3.5 Diaspora Remittance

Migratory remittances are money, commodities, and various attributes sent back to their home countries of origin or citizenship, by migrants' communities. Remittances are monies sent by migrants back to their home country. These remittances have economic significance for many of the countries that so receive them. Diaspora social remittances are mind-sets, ideas, world views, practices, attitudes, values, norms of behavior, and social capital (knowledge, experience, and competence) that diaspora migrants mediate and transfer resources from host environments to home communities, consciously or subconsciously. Migrants make capital transfers of financial assets when they migrate from one country to another for more than a year (Muguna, 2018).

Remittances can be a source of monetary inflow, boosting national income significantly. Remittances are a key source of foreign finance, and they can aid a country's financial development by alleviating credit constraints or providing replacements. When compared to private capital flows, the unique feature of remittances is that they increase when the economy of the recipient country experiences a drop following a crisis such as political turmoil or natural disasters. Migrants from other countries send monies to their families and friends of the target home country, during economic downturns, helping to enhance financial development and eliminate credit limits (World Bank, 2013).

Academics and policymakers examining the economic impact of migrant's remittances to the economic prosperity of receiver nation have been divided by the rise in remittance inflows in developing countries (Adam & Cuecuecha, 2010). The problem at hand is how remittances are spent, which has sparked a debate. The impact of remittance inflows on recipient countries' economic development is determined by whether they are invested or consumed. Remittances will have a favorable impact on growth if they are invested, but they will have no impact if they

are consumed, and they will have a negative impact on economic performance if they are consumed (Wanyoike, 2015).

Kenyans residing abroad contribute money back to their homeland on a regular basis. This money might be put to good use in the form of investments and family support. Diaspora remittances Kenya's economy is gradually rising. According to the World Bank report (2020), total remittances in 2016, 2017, 2018, 2019, and 2020 were USD 1.7241 billion, USD 1.9458 billion, USD 2.6969 billion, USD 2.7906 billion, and USD 3.0939 billion, respectively. Despite the good trends in remittances to Kenya, there are some variables that could cause remittances to decline. These causes include prolonged unemployment in Europe and the United States, which has an impact on existing migrants' employment prospects, therefore hardening political opinions toward new immigration. This implies reveals that, while remittances constitute an important factor in economic growth, they are fraught with controversy, necessitating further research (Muiruri, 2015).

The remittance inflow affects the rate of domestic savings positively. Therefore, the government is required to put more effort into enhancing the inflow of remittances by proposing preferential tax applicable to migrants' investments in bond markets as well as providing same tax prevalence for certain types of investments as international investors (Misati, Kamau & Nassir, 2019).

GDP growth and remittances from the diaspora have a sturdy positive association, therefore it's; assumed that remittances affect bond market growth. This indicates that a substantial share of the money sent home has directly trickled into the bond market, thereby enhancing the already strong growth (Belal, 2010). Diaspora Remittances are not only becoming a significant revenue source for any country, but also a significant income source for its inhabitants and people. Diaspora remittances to a country are not consumed entirely, but a significant portion of them is deferred through savings and investment (Bayar, 2016).

Diaspora remittances are important in maintaining the economy's balance of payment equilibrium because they help to offset the current account deficit that occurs when visible imports exceed visible exports. As a result, the remittance flow aids in

avoiding the negative effects of large current account deficits on the economy's performance. In addition, the inflows help the central bank build up its foreign currency reserves, which are critical for cushioning the local currency against any negative loss in value. Finally, because remittances from the diaspora are a source of foreign money, they enable the economy to pay for its imports, which require foreign currency (Kinuthia, 2013).

For the previous few decades since independence, Kenya has seen large numbers of its inhabitants migrate to other nations. This is attributable to a population segment which sees the overseas western world as a financial paradise, or due to the high unemployment rate, among other factors, driving majority of people to move in search of greener pastures. Because of skills shortage, these international movements of talented, un-skilled and semi-skilled, Kenyan individuals have negative consequences on the economy in terms of labor force (Akinpelu et al., 2013).

Focusing on the positive aspects of migrates data reveals that, Kenyans working and living in the diaspora contribute on the economic growth of Kenya through diaspora remittances. The spike in diaspora remittances to home countries of origin, which now outnumber aid and foreign direct investment to emerging nations, has sparked discussions in recipient countries about their economic potential (Bett, 2011).

Kenya government values the important role that citizens living in the diaspora contribute in the growth of the country. However, the enormous potential, is virtually unexploited. The Kenyan government has committed to engage citizens living in the diaspora and abroad in the development agenda of the nation in order to fully realize this potential (Ochieng, 2013). Their contribution to the implementation of Vision 2030 is acknowledged, particularly in encouraging significant investments in important economic segments including; financial services, health, education, housing, manufacturing, ICT-enabled services, Business Process Outsourcing (BPO), and tourism (Turner, 2012).

2.3.6 Growth of Bond Market

Bond market growth occurs when the market's size continues to exhibit a steady progress as more firms follow startup companies into a new industry products begin to be more diversified and the markets enter the growth stage. The expansion of a bond market is not only related to the market growth that comes with an increase in bond population or present customers, but it is principally driven by new customer acquisitions. Growth in the bond market gives businesses more choices for financing further allows the regime to move its internal debt to longer period-term securities (Agur, & Chan et al., 2019).

Bond markets in developing countries like Kenya have become an attractive investment target for several reasons. This market has a rapid growth characteristic to the extent that they have become the second largest source of financing in the emerging markets. Since the early 1990s, bond market liquidity and transparency in developing countries have been increasing during the last decade. Meaning, investors have always been analyzing every possibility of making an investment (Mbewa, Ngugi, & Kithinji, 2007).

Both treasury and corporate bonds are traded in Kenya's bond market. Treasury bonds were first issued in the mid-1980s, and in 1996, during the reform period corporate bonds were first issued. Notwithstanding the fact that treasury bonds were introduced early in the market, the bond market remained essentially stagnant, with the government relying on treasury bills to fund internal debt. The treasury and corporate bond markets did not become more active until 2001, when the government made a concerted attempt to grow the market. Bond markets, on the other hand, have yet to get transaction. However, bond markets are yet to gain growth momentum (Ndungu, 2013).

Certain conditions must be met in order for a higher growth rate to be achieved. These could consist of a well-developed liquid money market, more investor engagement with protection, efficient information asymmetry, and a well-functioning transaction system. The market's microstructure would be improved by these and allow for a faster rate of expansion. Mobile applications and solar power services are

two good examples of bond markets that are now in the growing stage in Kenya (Schlepper, & Hofer et al., 2020).

Between 2016 and 2018, total sales in each of these markets increased by at least 20% per year, indicating that they are all experiencing the benefits of being a growing market. Furthermore, improving the market's liquidity requires the development of a well-functioning money market. A vibrant money market implies a robust secondary bond market. To make a significant contribution to the growth process, a bond market must cater to a wide range of risk preferences. Particularly for treasury bonds, an effective financial system, sound and prudent debt management, and a credible, stable government are all required, (Maina, & Kimutai, 2018).

Along with the rapid growth in bond market size, there are other economic attributes connected with the growth of bond markets. Profitable opportunities exist in the growth of bond markets because demand tends to be greater than supply. Due to these profitable opportunities, new companies enter the market in an effort to capture those profits, resulting in a bond market with more competition established on product differentiation rather than price (Ngugi, & Agoti, 2009).

The level of Kenya's bond market growth shows that the country is very far from obtaining a better growth rate in the market. The length of a Treasury bond in Kenya is shorter compared to those in established bond markets, the trading system in Kenya is not harmonized, with intermediaries employing different pricing models, and the supervisory framework is too fragile to handle corporate bond divergence (Ngugi, & Afande, 2015).

Furthermore, corporate bond growth has yet to gain traction in the Kenya market. There are also discrepancies between the governing framework and the goals of the bond market growth rate. Hence, the growth rate of the bond market requires huge investment in institutional building (Boukhatem, Ftiti, & Sahut, 2021). Bond market growth is the most important factor to consider when calculating the development of a specific product in a specific market. Marketers frequently create a marketing campaign with the primary goal of maximizing the growth rate of a specific market. This can be accomplished through extensive advertising to increase consumer

awareness of the product or a better perceived understanding of their need for the product (Arslan, Drehmann & Hofmann, 2020).

2.4 Empirical Review

This section reviewed the empirical literature and discusses studies relevant to the study objectives. As a result, this part includes a discussion of studies that align with the study objectives, making it easier to identify the research gap that the study attempts to fill.

2.4.1 Inflation Rate and Growth of Bond Market

Existing studies on the impact of inflation rates on bond market growth to date are yet to arrive at a consensus. Majority of the empirical literature reviewed about the relationship between inflation rate and bond market growth indicates that inflation rate has an influence on bond value and thus bond market growth.

Rose and Spiegel (2015), examined the relationship between inflation and reality of a nominal, publicly traded and long-maturity bond market in Francisco. The study examined the change in inflation prior to and following the establishment of a bond market using a panel data approach. The study used annual data from over 200 countries between 1970 and 2012, focusing on countries that use regimes to seek inflation as well as those that use other monetary regimes and hard-fixed exchange rates. The study found that Inflation in inflation-targeting nations that has a bond market is three to four percentage points lower than in countries without a bond market and the effect was significant both economically and statistically.

Mohammad (2011) studied impacts of macroeconomic variables on bond performance in Bangladesh. The study spanned eight years, from 2002 to 2009, and the researcher relied on monthly observations. To determine the link between the variables, the researchers used the ordinary least square model and the Granger causality test. It was found that inflation rate had a positive association with bond performance, meaning that as inflation rises, the bond performance also increases.

Kullapom and Lalita (2010) examined the correlation amongst inflation and stock prices in Thailand. The study covers the Tsunami and the subsequent global financial crisis, which occurred between January 2000 and March 2010. To discover and assess the link between study variables, the researchers employed the vector auto regression (VAR) method. During the research period, both primary and secondary data was used in the study. The findings revealed that stock price fluctuations have no effect on inflation.

Gallagher and Taylor (2012) examined the relationship among bond returns and rate of inflation in France. The study relied on secondary data obtained from previously published sources. According to the study findings, there was a significant negative correlation between bond returns and the rate of inflation. Hondroyiannis and Papapetrou (2015) conducted a similar study in Greece. According to the study, a negative relationship between the inflation rate and bond market performance was established. As a result, as the inflation rate rises the bond market value moves down and the reverse holds.

A study was conducted in the United States of America, on inflation and bond returns in the United States by Lee (2012). According to this study, Inflation and bond market returns were found to have a positive relationship. The study establishes that during periods of high inflation, bond prices move upward. Furthermore, it found out that overpricing of bonds in the market of the United States resulted in an increase in inflation rates during the period of war.

Nkwede (2017) investigated the impact of inflation rate on the development of the bond market in Nigeria. Time series data collected from 1982 to 2013 were analyzed using ordinary least square regression techniques involving multiple regression. The total market capitalization of bonds, which encompasses both corporate bonds and government. The study's' main findings revealed that the inflation rate has a significant negative impact on capitalization of Nigerian bond market.

Ahwireng-Obeng and Ahwireng-Obeng (2019) conducted research about macroeconomic determinants among the development of sovereign bond markets in emerging economies in Africa. Panel data from the sovereign bond markets of 26

African countries was used in the study. The data collected ranged from 2005 to 2014. According to this study, domestic debt, inflation, external debt, Gross Domestic Product in PPP terms, of exports and fiscal balance are all significant macroeconomic determinants of sovereign bond market growth in Africa's developing economies.

Shehu (2011) explored the impact among inflation on bond returns and volatility. The study used the GARCH model to examine the impact of inflation on bond market returns and volatility using monthly time series data from Nigeria and Ghana. The findings in Nigeria, show only minimal support for the hypothesis was that bad news had a greater negative impact on stock market volatility than good news of same magnitude, while in Ghana, the converse is true. Additionally, the two countries' bond markets were found to significantly influence by inflation and its three-month average. This will undoubtedly lower bond market returns while also boosting investor confidence.

Fisher hypothesis was tested by Awomuse and Alimi (2012) by examining the association among inflation and interest rates in Nigeria by use of annual data collected from 1970 to 2009. The findings showed that, interest rates and inflation move in tandem, in the long run, but not in a one-to-one relationship. This means that the Fisher hypothesis as a whole does not hold up completely, but there is a very strong Fisher effect. The findings also demonstrated that, as proposed by the Fisher hypothesis and causality runs strictly from expected inflation rate to nominal interest rate, with no confounding variables (Sheefeni, 2013).

Sekitoleko (2018) investigated whether inflation-linked bonds could be a solution for Uganda's short-term debt crisis. The Uganda's internal debt poses two concerns to policymakers: it has expanded rapidly and has a very short maturity. The enormous amount of short-term debt continues to be a source of concern. The key policy recommendation is to promote inflation-linked bonds and rely on them more. In order to lengthen the term of the domestic public debt without causing time-consistency issues, the present roll over should be made with inflation-linked bonds. This will eliminate the possibility of a rollover risk.

Ngaruiya and Njuguna (2016) carried a study on the impact of inflation on bond prices in Kenya, case study on Nairobi securities exchange bonds. This study used an explanatory research design. The study population consisted of 65 bonds that were listed in the NSE in 23 categories. Within the research scope, a sample of ten bonds was chosen. Between January 2008 and December 2012, they used secondary data obtained from previously published journals. Inflation and bond prices were found to have a negative relationship, according to the findings. Finally, it was found out that an increase in rate of inflation may cause bond prices to fall.

Andere (2017) investigated the relationship between inflation and yield curve movement in Kenya. This investigation was conducted over a period, of six-years from 2010 to 2016.A descriptive research design was used. Secondary data from published sources collected in the study as well as primary data from questionnaires. The study findings concluded that inflation and yield curve movements in Kenya had a positive relationship. However, it revealed that the causal relationship between variables was primarily driven by the nature of the factors causing the inflation movements.

Nyambok (2010) investigated the relationship between inflation rates and the liquidity of Nairobi Securities Exchange-traded bonds over a three-year period, beginning in January 2007 and ending in December 2009. The Nairobi Securities Exchange, the Central Bank of Kenya, and the Kenya National Bureau of Standards provided secondary data for the study. The stratified sampling technique was used in this study. According to the research, as inflation rates rise, so does overall market liquidity in terms of trading volumes, and vice versa. This suggests that overall inflation rates and NSE bond liquidity have a positive relationship.

Ganatra (2016) conducted research on factors influencing performance of Kenyan infrastructure bonds. Primary goal of the study was to figure out what factors affect the Kengen bond's performance between 2010 and 2015. The following objectives guided the Study investigations: determining impact of interest rates, determining the impact of forex volatility rates, and investigating impacts of inflation rate on the performance of the Kengen bond. In the study, correlational and causal research

designs were used. Inflation rates and Kengen Bond performance were found to have a positive significant relationship, according to the study.

2.4.2 Interest Rate and Growth of Bond Market

Mohd Jefri, (2018) examined the elements that determine Malaysia's bond market performance. The objectives investigated in the study were, inflation rate, interest rate, bond yields and bond maturity. This study employed Malaysian government bonds as the financial data source, with 32 observations spanning the years 2010 to 2017. To evaluate the correlation among the independent variables and dependent variable, researchers employed linear multivariate regression analysis. The researchers found that maturity bond and interest rates have positive and insignificant impact on bond market performance.

Elton, Gruber, and Busse (2011) investigated the relationship among short-term, inflation rates, interest rates, Gross Domestic Product growth rates, and yield of government bonds. The OECD countries were the focus of this research. According to the findings, these macroeconomic variables have a significant positive relationship with yields of government bond. In general, market interest rates rise would make new bond less appealing since the existing bond would pay greater in interest returns.

Smales (2017) carried out a study in the Australian market to investigate impact of interest rates on performance of bonds. It was found in this study that rates of interest had an impact on bond performance. Secondary data from published journals was used in the study. Further, the researcher established that right after a scheduled macroeconomic announcement, the sensitivity to order flow went up in the Australian interest rate futures markets. This was attributed to an increase in the level of information asymmetry.

Vissing-Jorgensen and Krishnamurthy (2011) evaluated the influence of Federal Reserve's purchase of long-term Treasuries and other long-term bonds between 2008 and 2011 on rates of interest in the United States. The study used event-study methodology. The study reveals that Treasury rates should not be used as a policy

target. Focusing solely on Treasury rates as a policy target is ineffective since they operationalized through multiple channels, each of which affects different assets in different ways. Evidence was found for a signaling channel, and a distinct demand for long-term safe assets, and an inflation channel.

Wuhan and Khursid (2015) investigated how investment in China was affected. The study's main goal was to see how interest rates affect investment in Jiangsu province, China. The study relied on secondary data collected within a ten-year period, from 2003 to 2012. According to this study, the long run relationship is negative but positive in the short run. Also, it was concluded that falling bond prices would lead to rising interest rates. As a result, the study was relevant to the current study because it demonstrated how interest rates affect bond investments.

Radier et al. (2016) investigated factors that influence fluctuations of South Africa's bond yield spreads. A case of the factors of bond yield spread variations from the perspective of an emerging market. The research covered the years 2005 to 2013. The study was based on a sample of 106 corporate vanilla bonds traded on the South African stock exchange. The effect of the 2007-2008 economic crisis was captured by separating the study sample period in three sub-periods: pre-financial crisis (2005 to 2006), mid-financial crisis (2007 to 2009), and post-financial crisis (2010 to 2013). According to this study, bond yield spreads are significantly influenced by fluctuations in stock volatility, levels in interest rate, and slope of yield curve. At the middle of the financial crisis, the consequences of stock market volatility and levels in interest rate became increasingly prominent. Controlling for credit ratings and bond convexity had no effect on the results, according to the study.

Mu, Stotsky and Phelps (2013) investigated Africa's bond markets, combining set unique data on Africa's corporate and government bond markets. The study's objectives were to evaluate the association between interest rate volatility, economic size together with fiscal deficits using an econometric model. The findings revealed that market capitalization of government securities was negatively and significantly related in lowering fiscal deficits, exchange rate volatility and wider spreads of interest rate. Finally, capitalization of corporate bond market had positive significant

relationship to economic size, economic and financial market development, better organizations, also interest rate volatility, while it was negatively related to current account openness and higher interest rate spreads.

Okafor (2018) conducted research on major determinants of bond market development in Nigeria and South Africa. The primary goal is to investigate the major drivers of bond markets and it includes the following; budget deficit, inflation rate, interest rate, exchange rate and external debt. An ex post facto research design was used in the study used with 24-year time series data sourced from secondary data. According to the study's findings, the main determinants of bond market growth were interest rates and the fiscal deficit. The study found that both interest rate and budget deficit were main determinants of bond market growth in Nigeria and South Africa and drives this market positively in both countries.

Munguci (2019) investigated on the factors that affect the performance of bond market in Uganda. The study period was 2014 to 2018. Inflation, money supply and Interest rates are independent variables considered in this research. The study considers bond market in Uganda with a particular emphasis on bond yield and macroeconomic factors that influence yield. This study's yield curve model explicitly interpretations for both yield factors and macroeconomic variables. Bond yield and macroeconomic conditions have a statistically significant relationship, according to the study's empirical findings,

Nuwagaba (2013) evaluated the Rwandan bond market's performance and provided recommendations on how it could be improved. The study lasted for six months, starting October 2012 to February 2013. For this study, both a quantitative and a qualitative approach were used. The Rwanda's stock exchange trades both corporate bonds and treasury bonds. In 2011 and 2012, bond market returns increased. This may be due to YTM terms, coupon rates, or the bond's maturity period. The results of the study showed that Rwanda's bond market had underperformed. The development of Rwanda's financial market will determine how quickly the country continues to grow.

Adetiloye, and Okoye et al. (2017) analyzed the relationship among interest rate spread and development of corporate bond markets in thirteen African countries. The study used fully modified ordinary least squares in the ARDL framework and was done between 2004 and 2014. Interest rate differentials have a detrimental influence on issuance of corporate bond as a proxy for economic development in the short run and long run, according to the research. In order to support expansion of corporate bond offerings and market-led financial development, the paper presents policy ideas for lowering interest rates and, as a result, the spread.

Ndunda (2018) studied the effects of interest rates on bond yields in Kenya. The research focused on 15 corporate bonds issued between 2008 and 2014, spanning a seven-year period. The study relied on secondary data and used casual research design. The liquidity premium theory of interest rates, market segmentation theory, and preferred habitat theory were all used in the research. The study findings were that, Bond yields and interest rate risk had a positive relationship.

Ochieng (2016) investigated effects of interest rates on bond values in Nairobi Securities Exchange. The researcher conducted quasi-experimental research, by regressing the nominal value of treasury gilt-edged bonds alongside the three regressors (interest rates) by use of regression statistics. The three types of interest rates were the research focus: central bank rates, REPO rates and interbank rates. Study period was from 2008 to 2014 and used secondary data. According to the findings, the IBR and the repo rate have a positive impact whereas CBR has a negative impact on the nominal value of treasury gilt-edged bonds,

Njoroge (2013) did a study on the association between interest rates and the financial performance of Nairobi Securities Exchange on listed companies. Causal research design was used in this study. Secondary data gathered from publicly available financial records and CBK publications from 2008 to 2012, which spanned a five-year period was used. The findings of this study revealed that interest rates and financial success had a statistically positive significant relationship. Finally, it was shown that a linear regression model can be used to anticipate financial performance

of enterprises at specific interest rate levels where a statistically significant association exists.

Balozi (2017) investigated the factors that influence Kenyan government bond yields. The impacts of the national budget deficit, interest rates and inflation, on the yield of Kenya government bonds were investigated in the study. Secondary data provided by the Central Bank of Kenya and the Kenya National Bureau of Statistics which employed times series regression model to look at data from 1985 to 2015 was used for this study. When the data is normalized using an ARIMA model, the findings show that the budget deficit, inflation rates, and changes in interest rate had impacts on yield of government bonds. The study advised bond investors should totally comprehend market trends for them to make the best bond purchasing decisions.

Kamenju (2018) examined the influence of macroeconomic variables on bond market development in Kenya. Using a census sampling model, the study used causal research design with target population of all 81 issued corporate and government bonds in Kenya bond market. Secondary data was employed and data collection sheet was created to aid in data access from CBK, NSE, and KNBS, among other sources from 2015 to 2020. The data was analyzed using the regression model scientific model from social sciences. According to the study, inflation all had a positive and significant impact on the Kenya's bond markets growth.

2.4.3 Exchange Rate and Growth of Bond Market

Le, Nguyen and Nguyen (2015) investigated the growth of corporate bond markets. This study looked at the effects of macro-determinants on corporate bond issuance by firms in 90 both developed and developing countries from 1970 to 2013. The model used in the research was the Generalized Method of Moments (GMM) model. The corporate bonds data was annually collected from 90 countries. According to this study, exchange rate volatility and bond value in the previous year have a positive impact on corporate bond issuance, whereas economic openness has a negative impact. The amount issued in other denominations was converted into US Dollars at the average current exchange rate.

Francová (2017) investigated on the government bonds valuation in which exchange rate plays important role. The results were yielded by a panel regression analysis of time series from January 2010 to December 2015. The regression model was used separately for developing and emerging markets. The researcher possessed one-of-a-kind data set from 46 countries. The main set of data was monthly government bonds returns from 2010 to 2015. The literature review reveals that market bond prices are influenced by exchange rate risk. In any case, this variable needs to be investigated further so as to gain a better insight of the relationship between the exchange rate and the price of bonds.

Bhattacharyay (2013) conducted research on the empirical analysis of key factors influencing Asia's bond market development. The economy size, economic stage growth, economy openness, banking sector size and interest rates are all important elements in the bond markets development in an Asian country. Multivariate OLS, Simple OLS, random effects, fixed effects, and GLS models were used to conduct the investigation. The research was based on a ten-year multivariate regression model by use of cross-section panel and time series data from 1998 to 2008. The study found that the total bond issuance has a considerable negative association with exchange rate variability.

Francová, (2018) analyzed the effects of selected factors on the US bond market. The purpose of this study is to determine whether including various economic variables in predictive regressions improves forecasts for the monthly US bond return. The study linked bond prices with a range of macroeconomic statistics, including inflation, interest rates, and exchange rates. The study made use of a large dataset from Morningstar from 2001 to 2017 and employed OLS linear regression analysis approach with fixed effects. According to the International Arbitrage Pricing Theory, exchange rates have an impact on the costs of capital assets as well as the premiums and risks attached to them. Bond prices are affected differently by several factors depending on the yield and time period. Bond prices are significantly impacted by changes in exchange rate.

Lusarczyk, Meyer and Neethling (2020) used South Africa as a case study in which the relationship between government bond yields, exchange rates, and other

monetary variables were evaluated. A quantitative methodology for estimation of an econometric model employing monthly time series data from 1994 to 2020 was utilized. Both the short-run and the long-run relationships between the variables were established using the vector error correction model (VECM) and the Johansen co-integration approaches. The long-run results exhibited significance since they exhibited that a currency that is weakening, inflation and rising interest rates, along with rising debt levels, resulted in higher bond yields, which resulted to higher debt repayments. The study found that a stable macroeconomic environment stands necessary for economic growth. However, volatile exchange rates and yields have a negative impact on growth, whereas rising inflation leads to higher repo rates and depreciating exchange rates; in addition, inflation should be kept within inflation targets; and, finally, policy certainty is necessary to keep rates and yields constant, which could lead to investor confidence.

Matshego (2019) investigates the factors that influence of a local currency bond market development: the macroeconomic stability importance. Thus, from 2003 to 2013, this thesis examines the drivers of the growth of local currency bond markets in 15 Sub-Saharan African economies. The empirical study looks at capitalization of government bond, whereas seven of these economies were looked at by the corporate bond market study between 2004 and 2015. Macroeconomic insecurity was found to be significant and negatively associated with local currency bond market capitalization.

Gadanecz, Miyajima and Shu (2014) studied the relationship between risk of exchange rate and sovereign bond yields on local currency in emerging markets. The study looks at how exchange rate risk affects the yields on domestic currency sovereign bonds in developing market economies. According to the findings, when exchange rate volatility rises, exchange rate risk has a significant impact, investors demand a higher yield compensation as a result of holding local currency sovereign bonds. The impact of exchange rate volatility has grown since May 2013, as investors have realized, that Federal Reserve may reduce its asset size of purchases faster than expected.

Ochieng (2016) did an investigation on the effects of currency fluctuations on the performance of the N.S. E. The variables being investigated are the NSE All and 20 Share Indices, as well as the foreign exchange rate. The researcher used Secondary data from the Central Bank of Kenya rates and statistics, together with the Nairobi Securities Exchange. The stock index data was obtained from NSE reports, while CBK reports were the source of the exchange rate data. The research data set included monthly data observations for index movement and FOREX volatility data over the period from December 2010 to August 2016. To achieve the research's goals, the study used both a descriptive and a longitudinal design. The data was modeled by use of a time series regression model. Results of Pearson's partial correlation and regression analysis show that the Nairobi Securities Exchange Market foreign exchange rate performance and the foreign exchange rate have weak and negative correlations.

Ngabirano (2016) looked into the factors that influence corporate bond performance in Kenya. The following research aims led the study: to identify the internal and external factors of corporate bond performance, as well as to evaluate measures to improve corporate bond performance in Kenya. A population of 18 business issues listed on the Nairobi Securities Exchange was the subject of a causal study design (NSE). This study focused on 18 corporate issues that were listed on the fixed income market of the NSE. According to the study, there was a negative link between corporate bond liquidity and bond characteristics such bond rating, term, and coupon. Further, insignificant correlation between interest rates, inflation rates, and corporate bond performance was discovered by the study.

2.4.4 Gross Domestic Product and Growth of Bond Market

Fink, Hasiss, and Hristoforova (2013) looked at the relationship between aggregate bond market development and real GDP in 13 highly developed nations, including the US, the UK, Switzerland, Germany, Austria, and the Netherlands. The research was conducted between 1950 and 2000. The unit root and co-integration of the study variables were initially treated by the authors of this study. The seven countries were then subjected to a VAR model of initial differences with a maximum lag period of four years. In the study for long-run equilibrium convergence and interdependence in

Japan, Italy, Finland, and Portugal, empirical evidence assumed that real GDP and the size of the bond market follow a common stochastic trend in the long run, whereas evidence from autoregressive models in the short run supports the supply-leading assumption.

Said (2013) investigated the relationship between the East Asian bond market and economic growth. From 2002 to 2009, data from China, Hong Kong, Japan, South Korea, and Thailand were used to examine three types of loans. The findings confirm that private and public debts both contribute significantly to the region's economic growth. The significant contribution of debt markets to GDP, on the other hand, is not consistent across all countries in the sample and varies depending on the type of debts issued. Both public and foreign currency debts have significantly contributed to South Korean GDP, but only public debt has significantly contributed to China and Hong Kong's growth. None of Japan's debt markets have had any impact on the country's GDP.

Smaoui, Grandes and Akindele (2016) investigated the factors that influence bond market development in emerging and developed economies. From 1990 to 2013, this study empirically investigates the structural, financial, developmental, institutional, and macroeconomic determinants of bond market development for a sample of 22 emerging and developing countries. To address the issue of endogeneity among the explanatory variables, the study used both the Prais-Winston and system GMM procedures. Secondary data from published reports were used in the study. A confluence of macroeconomic, financial, and institutional variables had a positive influence on bond markets, according to the research. Indeed, the bond market's growth is influenced by economic size, trade openness, investment profile, GDP per capita, bureaucratic quality, and the size and concentration of the banking system.

Kapingura and Makhetha-Kosi (2014) used South Africa as an example to look into the unintended relationship between bond market expansion and economic growth in Africa. From 1995 to 2012, the study was conducted. After doing statistical and time series analysis on the data set using the Augmented Dickey-Fuller (ADF) and Phillips-Perron models, the researchers used the Engle and Granger Single-equation

based two-step approach to see if the two variables are co-integrated (PP). The study's empirical findings revealed a unidirectional causal relationship between the bond market and economic growth, with the bond market leading to economic growth.

Shehu (2010) investigated whether inflation has an effect on bond returns and volatility. The research was carried out from March 2000 to March 2010.The study used a Generalized Autoregressive Conditional Heteroskedacity (GARCH) model to analyze the influence of inflation on bond market returns and volatility using monthly time series data from Nigeria and Ghana. In Nigeria, the results reveal only minimal support for the hypothesis that bad news has a greater negative impact on stock market volatility than good news of the same magnitude, whereas in Ghana, the converse is true. Additionally, the two countries' bond markets were found to be significantly affected by the inflation rate and its three-month average. This would undoubtedly lower bond market returns while also increasing investor confidence.

Ahwireng-Obeng (2016) identified the performance drivers of African emerging market local currency bond markets. This study examines the characteristics and features of the African financial system from 2005 to 2013. Using macroeconomic, social, institutional, and historical data from 26 African economies and 49 publicly traded firms on the local currency bond market. According to the findings, inflation, central government debt, GDP, external debt, GDP per capita, and fiscal balance are important macroeconomic drivers of the development of local currency bond markets in African economies.

Musah (2019) investigated the impact of bond market determinants on the development of the Ghanaian bond market. The research Data was gathered from secondary sources spanning the years 1980 to 2015. As a data analysis technique, the Vector Error Correction Model (VECM) was used. To ensure the robustness of the results, the Augmented Dickey-Fuller (ADF) stationary test, and the Johansen Co-integration test were employed. According to the study's findings, bank size, external debt, money supply, and the size of the economy are all important determinants of corporate bond market development in Ghana. Furthermore, the level of economic

development, budget deficit, and bank size are important determinants of the size of the Ghanaian government bond market. However, bank size, money supply, and external debt are regarded as the most important and significant drivers of Ghana's total bond market size.

Juma (2019) examined the impact of bond market expansion on East African community members' economic progress. The study's goals were to look into the impact of rising bond markets on economic growth in EAC member countries. Members of the East African Community made up the study's population. Secondary data was acquired for this research. The final results indicates that the cost of living in the East African Community fluctuated dramatically between 2009 and 2018. Bond market development has a favorable impact on economic growth in EAC member nations, according to the research.

Didia and Ayokunle (2020) investigated external debt, domestic debt, and economic growth. This study examined the impact of government debt on Nigerian economic growth using annual data from 1980 to 2018 and the Autoregressive Distributed Lag technique. External debt was found to be a long-term growth impediment, while its short-term effect was growth-enhancing. Domestic debt boosted long-term growth while dampening short-term growth. Debt service payments, both long-term and short-term, slowed growth, confirming the debt overhang effect.

Nyakeri (2012) investigated the relationship between certain macroeconomic variables and bond yields on the Nairobi Securities Exchange. The study aims to determine the relationship between bond yields to maturity and selected macroeconomic variables in Kenya over a five-year period, from January 2007 to December 2011. Secondary data from the NSE, CBK reports and publications, and annual economic survey reports were used in the study. The study's findings indicate that macroeconomic variables such as GDP have no significant impact on bond performance.

Githinji (2013) investigated the impact of selected macroeconomic variables on the development of the Kenyan bond market. The study variables include economic size, exports, interest rate volatility, fiscal policy, and GDP per capita. In this study, a

causal research design was employed. The study used secondary data gathered from 2008 to 2012. The research reveals that GDP per capita and GDP at purchasing power parity had a negative influence on the development of the bond market. It is therefore recommended that policymakers place more emphasis on the four main variables identified in order to promote growth in the bond market.

Koka (2012) conducted research on the relationship between the issuance of treasury or government bonds and Kenyan economic growth. The study, which spanned a period between 2003 and 2011, relied on secondary data. The study investigated the relationship between gross domestic product, bond market capitalization, bond trading value, and total new bond issues. The researcher discovered that the issuance of government bonds has a positive impact on Kenya's economic growth.

2.4.5 Diaspora Remittance and Growth of Bond Market

Raza and Jawaid (2014) investigated the impact of remittances on stock market development in 18 Asian countries. The time series data was analyzed using ARDL cointergration and and Yamamota causality tests. Secondary data was collected covering a period of ten years from 2000 to 2010. The findings indicated that remittances had a significant impact on the development of the stock market. The Toda-Yamamoto causality test revealed that there was a bidirectional causal relationship.

Masuduzzaman (2014) examined the role of remittances in economic growth and the interaction of remittances with Bangladesh's financed development. The study relied on secondary data from 1981 to 2013. The Johansen co-integration test, as well as the vector error correction model and Granger Causality tests were used. The study found a long-term positive relationship between remittance inflows and GDP, indicating that remittances are more likely to contribute to Bangladesh's long-term growth. It also revealed that remittances had a significant positive impact on financial development.

Githaiga and Kabiru (2014) investigated the impact of remittances on the development of the financial sector. The data on remittances, financial sector

development, and control variables for the thirty-one countries between year 1980 and 2012 were employed. The General Moment Method (GMM) was employed. To analyze the data, the findings indicate that remittances have a negative impact on both domestic private sector lending and direct foreign investment. However, the study also found that remittances had a positive significant influence on bank deposits.

Akinpelu et al. (2013) investigated the effect of remittance inflows on Nigerian economic growth. The study used remittance inflows as the independent variable and other traditional sources of economic growth as the control variables, such as capital represented by foreign direct investment, the openness of the economy to assess the relationship between the remittances and economic growth in Nigeria. The acquired data was analyzed using cointegration and causality tests. The study's findings revealed that the variables used in the experiment have a long-term equilibrium relationship. The Causation test revealed a uni-direction causality between GDP and remittance inflows, capital formation and remittance inflows, and remittance inflows and openness.

Mohamed (2019) carried research on remittances and economic growth in Uganda. The primary purpose of this study was to look into the relationship between remittances and Ugandan economic growth from 1993 to 2017. The ADF and Philip Pearson tests were employed to conduct the stationary tests, which were based on secondary data from the UN and the World Bank. The study employed co-integration to examine the long-term association between remittances and economic growth. Remittances have a positive significant impact on economic growth. The study found that remittances are one of the most important variables positively influencing Uganda's economic growth.

Balima and Combes (2019) conducted research on remittances and bond yield spreads in emerging market economies. According to data, remittance inflows significantly reduce bond yield spreads. The sample is made up of annual unbalanced panel data from 38 emerging markets from 1993 to 2012. Changes in specifications, other instrumentation techniques, additional control variables, and the use of credit

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default swap spreads instead of bond spreads all had no effect on the outcome. In addition to the traditional system GMM, we propose an augmented system GMM that makes use of our instrument to improve estimate efficiency. The study reveals that remittance inflows considerably lower bond spreads in emerging market nations

Rakhal (2018) examined how certain macroeconomic variables, such as remittances, money supply, exchange rates, and interest rates, affect stock market performance on Nepal a country in South Asia. An empirical investigation in Nepal using monthly data from 2003 to 2012 yielded the findings. Time series data were used and analyzed with SPSS software to determine how the variables affect the share price index separately and collectively. The Durbin-Watson test, as well as the F-test and T-test, were used to evaluate autocorrelation. The research reveals that remittances and money supply have a positive impact on stock market performance, whereas interest rates and exchange rates have a negative impact.

Wanyoike (2015) investigated the impact of Diaspora remittances on the Nairobi Securities Exchange's stock market performance. The study relied on secondary data obtained from the Central Bank of Kenya and the Nairobi Securities Exchange over a seven-year period, from February 2008 to May 2015. The following are the variables that were used; Inflation, interest rates, and currency exchange rates. The study used a descriptive analysis design, and the data was evaluated on a monthly basis using time series regression model. The impact of remittances from the diaspora on stock market performance was examined using multiple regression analysis. According to the findings, diaspora remittance has a large and positive impact on stock market performance. Increased diaspora remittances boost stock market performance, and vice versa.

Kanyeke (2014) investigated on effect of Diaspora banking on financial performance of Kenyan commercial banks. The research employed secondary data that was obtained from CBK, which is available in the annual reports. The study was based on the theory of financial intermediation and delegated monitoring, the theory of information production, and the theory of liquidity transformation. The data in this study was analyzed using multiple regression analysis. The information gathered for

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this study was gathered over a five-year period, from 2009 to 2013. According to the study, there is a significant positive relationship between Diaspora banking and the financial performance of Kenyan commercial banks.

Muiruri (2015) investigated the impact of diaspora remittances on Kenyan real estate growth. The study also looked into how GDP, unemployment, inflation, and interest rates affect the growth of Kenya's real estate sector. The study employed a descriptive research design and covered ten years, from 2004 to 2013. The study used the Ordinary Least Squares (OLS) technique of regression analysis to explore into the impact of economic growth, exchange rates, and remittances from the diaspora on real estate growth in Kenya. According to the findings, Diaspora remittances have a negative impact on Kenyan real estate investment.

Waweru (2014) conducted research on the effects of macroeconomic variables on the liquidity of Nairobi securities exchange infrastructure bonds. In this study, a causal research design was used. From 2009 to 2014, the study used secondary data from the CBK, NSE, and KNBS. Interest rates, inflation rates, exchange rates, diaspora remittances, and GDP are among the study's variables. In the study, descriptive statistics were used. The extent to which macroeconomic factors have influenced the liquidity of infrastructure bonds listed at NSE was assessed using multiple regression analysis. SPSS was used to analyze the data. According to the study, there is a positive relationship between the liquidity of infrastructure bonds and exchange and interest rates. The variability of inflation rates, real GDP, and diaspora remittances all have a negative relationship with infrastructure bond liquidity.

Osoro (2020), conducted research on diaspora remittances and stock market development at Kenya's Nairobi Securities Exchange. The goal of this research was to see how diaspora remittances affected stock market development. The quarterly time series data from 2008 to 2018 were analyzed using correlation analysis and the Autoregressive Distributed Lag Model. According to the study's findings, diaspora remittances have a positive and significant impact on stock market growth in the short run. According to the study, the Kenyan government should establish an economic relations department in all Kenyan foreign embassies around the world to

educate Kenyans living abroad about the Nairobi Securities Exchange's investment prospects and the importance of investing at home.

2.5 Critique of Existing Literature

The primary goal of the study was to investigate the relationship between macroeconomic variables and the growth of bond market in Kenya with a moderating variable of diaspora remittance. Most of the literature and studies on macroeconomic variables and the growth of bond markets have been conducted in developed countries, and as a result, there are very few studies on the subject conducted locally, particularly those focusing on the growth of bond market (Francová, 2018; Fink, Hasiss, & Hristoforova, 2013; Bhattacharyay, 2013). The studies examined were conducted in the context of developed economies. As a result, the research findings may be applicable or true to developed-country bond markets. Consequently, the generalization of research findings is not applicable in Kenya, a developing country.

Most studies focused on the effects of macroeconomic variables on bond market performance, bond returns, bond prices, and bond yields but few looked at the growth of bond market (Radier et al., 2016; Munguci, 2019;), Although such studies may have a similar impact on the growth of the bond market, the generalization of their findings may not be reliable. (Nyakeri, 2012; Musah, 2019; Munguci, 2019) concentrated on macroeconomic variables and the growth of bond markets but failed to include the moderating variable in their studies. As a result, generalizing the findings of these studies is not conclusive.

Other studies focused only on one macroeconomic variables on the growth of bond market (Ochieng, 2016; Ngaruiya & Njuguna, 2016). These studies did not focus on how different macroeconomic variables affected the dependent variable. The findings, however, would have been more representative if the researcher had conducted the study across a variety of macroeconomic variables. Furthermore, these studies would have been more applicable if the researchers had considered the relationship between macroeconomic variables and the growth of bond market

A study conducted by Githinji (2013) focused on macroeconomic variables and bond market development in Kenya from 2008 to 2012. The four-year study period was too short, and the study could have been more representative if it had been conducted over a longer period. The study was also supported by inadequate theories and lacked a moderating variable. The lack of adequate theory application may have limited the ability to understand macroeconomic variables and the development of the bond market and its related variables, as well as the relationships between them. This makes generalizing research findings from one context to another difficult.

Balozi (2017) find that budget deficit, inflation rates, and interest rate changes all have a positive influence on the yield of government bonds using ARIMA model for a period of 30 years, Kullapom and Lalita (2010) found that inflation has no effect on stock prices using VAR model for a period of 10 years. Bhattacharyay (2013) finds a negative significant influence between total bond issuance and exchange rate variability using Multivariate OLS, Simple OLS, random effects, fixed effects, and GLS models for a period of 10 years. These studies yielded contradictory results. The inconsistency may be due to the various methods of data measurement and data analysis, as well as the different study period duration.

2.6 Research Gaps

The literature reviewed includes numerous empirical studies that have examined the influence of macroeconomic variables on the growth of the bond market. Consequently, the previous reviewed studies have highlighted conceptual, contextual, and methodological gaps that the current study attempts to fill. At the contextual level, most of these studies have been conducted in developed countries for instance; Mohammad (2011), Lee (2012) and Mohd Jefri (2018. As a result, this study expands on previous research by investigating the influence of macroeconomic variables on the growth of bond market in Kenya.

There are many inconsistencies in the findings made by the studies reviewed with regard to the influence of macroeconomic variables, namely, inflation rate, exchange rate, interest rate, and gross domestic product, on the growth of the bond market. Empirical literature reviewed in this study affirms the reality that most of the studies

done to examine the effect of macroeconomic variables on bond market growth in Kenya have returned mixed findings (Waweru, 2014; Grober & Kamin, 2012).

These inconsistencies in the findings provide a need for further investigation to narrow the findings. There is a need for the inclusion of several macroeconomic variables into new studies to identify the main responsible variable that contributes, to a great extent, to bond market growth in order to advise on policy. Additionally, various studies have used different methods and in different combinations of different macroeconomic variables, a reason that could explain the inconsistencies in findings. This implies a need for many more studies using different methods to assure consistency in the findings.

From an empirical review of relevant existing literature, there are few studies specifically in the Kenyan context on the relationship between macroeconomic variables and the growth of bond markets in Kenya. There was an important variable diaspora remittance omission as a moderator. The majority of studies do not take a moderating variable into account at all (Mohd Jefri, 2018; Munguci, 2019; Ahwireng-Obeng &Ahwireng-Obeng, 2019). In view of limited studies and literature, this study finds the need to establish the moderating effect on the relationship between macroeconomic variables on the growth of bond markets in Kenya.

This study identifies a knowledge gap from three perspectives: inconsistency in findings regarding the effect of macroeconomic variables on bond market growth; limited inquiries made to cross-examine the effect of diaspora remittance in the relationship between macroeconomic variables and bond market growth; and finally, there is a need to apply different methods to narrow inconsistencies in the outcomes.

2.7 Summary of the Literature Reviewed

The entire chapter discussed empirical and theoretical review. There has been theoretical contribution and justification presented. An empirical argument establishing the relationship between study variables has also been presented.

Earlier studies on macroeconomic variables differ on the extent of the relationship between macroeconomic variables and the growth of bond market. The studies were also conducted in various contexts ranging from global to local, using varying methodologies and taking into account various macroeconomic variables and the extent to which each significantly influences growth of bond market. From these empirical review contradictory findings have been reported.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research methodology used by the researcher to conduct the study. The term research methodology refers to techniques, procedures and methods of collecting, analyzing, and interpreting data. It basically includes general principles and philosophy that provide guidelines on how the entire research process is carried out (Cooper & Schindler, 2011). The research techniques discussed in this chapter includes; research philosophy, research design, study population, sample frame, data collection instruments and processes, diagnostic testing, data processing and data presentation.

3.2 Research Philosophy

Positivism research philosophy was used to guide the whole study in relation to the sources of data, type of data, methods of analysis and basis of interpreting the findings. There is a close relationship between the knowledge development and nature of knowledge. The purpose of coming up with new research paradigms is to offer new ways of thinking about the world and generate new questions to ask while coming up with new ways of pursuing those questions (Saunders, Lewis & Thornhill 2013).

The essential nature of research paradigms from the viewpoint of the world emanates from combining approaches founded on qualitative and quantitative methodologies with the aim of promoting a worldview that motivates humanity to share beliefs. Although research paradigms seem to exhibit a kind of procedural aspect, they are different from research methods that basically involve techniques, methods and approaches for collecting data (Antwi & Hamza, 2015).

The positivism philosophy is founded on the theory that the only trustworthy knowledge is that gained through observing and measuring parameters. Thus, positivism limits the role of the researcher in collecting data and interpreting it on the

basis of an objective approach. Positivism emphasize that research findings must be observable and quantifiable in numerical terms (Rahi, 2017).

Based on the aforementioned assertion, the positivism paradigm is founded on philosophical positions that require the use of empirical data and scientific methods. The characteristics of the data that is used in this study are observable, quantifiable and empirical. Additionally, this study is scientific in its approach and thus adopts the positivism philosophy.

3.3 Research Design

Coopers and Schindler (2011) describe the research design as blueprint providing the processes of collecting, measuring, and analyzing data. According to Kothari (2020), a research design is the conceptual framework within which a research study is carried out. The purpose of research design is to provide a general strategy and structure for carrying out a research study with the aim of investigating specific research questions that are testable (Bordens & Abbott, 2011).

The research design used in this study was descriptive casual survey. According to Bougie and Sekaran (2019), the purpose of a descriptive study is to identify and characterize the features of the variables of interest in a particular context. To achieve the goal of the study, a descriptive design was adopted for a thorough analysis and assessment of the variables.

The causal research design evaluates the cause-and-effect relationships between variables in the study. It is based on the idea that if two variables have a statistically significant relationship, the dependent variable can be predicted using knowledge of the independent variables. The outcomes will have either positive or negative relationships (Asenahabi, 2019).

3.4 Population of the study

Saunders, Lewis and Thornhill (2013) define population as the full set of cases from which the sample is taken, and it should have some common observable characteristics. A population is a collection of all items, subjects, or members that

meet a set of criteria, or an entire group of people, events, or things that have similar features. A target population is a group of people, events, or things from which a research study intends to generalize its findings. The population of the study represents all the individuals that are in a realistic position to be involved in the study (Bougie & Sekaran, 2019). The population of the study consists of 240 monthly market observations. For this study, a census survey was carried out.

3.5 Sampling Frame

A sampling frame is a list used by researchers to define the population of interest and provides a set of elements from which a researcher selects a sample. It is a list that contains information about the accessible population from which the sample can be drawn. A sampling frame is also a set of source materials or a list of items from which the sample is selected (Greener & Martelli, 2018). The macroeconomic data from the Central Bank of Kenya (CBK), the Kenya National Bureau of Statistics (KNBS), and the Nairobi Securities Exchange (NSE) were used to create the sampling frame for this study, which covered a 20-year period from 2001 to 2020.

3.6 Data Collection Instruments

The instruments of data collection are the tools that the researcher uses to collect information, answer questions, and achieve the objectives of the study (Willimack, 2013). Secondary data is the type of data sourced from already published sources such as statistics from national bureaus, magazines, and previous research (Kothari, 2020). The data was collected using a secondary data collection instrument sheet, which is presented in Appendix i. The information was obtained from the Central Bank of Kenya (CBK), the Nairobi Securities Exchange (NSE), and the Kenya National Bureau of Statistics (KNBS).

3.7 Data Collection Procedure

The methods used to collect data in a study are known as data collection procedures. It specifies the sequential steps that must be taken by a researcher to carry out a research study in order to answer specific phenomenon questions (Blumberg,

Cooper, & Schilder, 2014). The current study's objectives and purposes guided the data collection procedures and instruments. Similarly, the types of data collected using an appropriate instrument were influenced by the specific objectives of the study (Kothari, 2020). This study used secondary data that was obtained from reports already published by CBK, NSE and KNBS.

Table 3.1: Source of Data

Variable	Measure	Data Source
Inflation rate (Independent Variable)	Monthly Average Consumer Price Index.	KNBS
Interest rate (Independent Variable)	Monthly average Commercial Bank Lending rate.	CBK
Exchange rate (Independent Variable)	Number of Kenyan Shillings Exchanged for 1 US dollar.	CBK
Gross domestic product (Independent Variable)	Income of the Country.	CBK
Diaspora Remittance (Moderating Variable)	Value of Remittance	KNBS
Bond market growth (Dependent Variable)	Value of the Bond Market	NSE

3.8 Diagnostic Tests

According to Krämer and Sonnberger (2012), diagnostic checking is the process conducted to prevent adverse effects caused by wrong measurements from the regression model. Hence, most econometricians use diagnostic tests for their studies in order to obtain more accurate results. It is important to provide a diagnostic check for the model before we move to model estimation. The following are the diagnostic tests that were adopted in the study:

3.8.1 Normality Test

In this study a normality test was conducted to determine the distribution patterns of residuals and whether the data set resembles the normal distribution. This test was created to find indications of a deviation from a normal curve in the distribution. This test was conducted by using a graphical or statistical method. The graphical methods used include the use of box plots and QQ plots (Schmidt & Finan, 2018).

Among other techniques used for checking normality assumptions, the Jarque Bera statistical test method was adopted and is commonly used for normality tests and has a chi-square. The reason for using this test is that it is an asymptotic test dedicated to the ordinal least square and it captures both skewness and kurtosis (Reinders, 2021).

Skewness and kurtosis for normal distribution data must be 0 and 3, respectively. According to the rule of thumb, if the probability value for Jarque Bera was greater than 0.05, the study failed to reject the null hypothesis, and thus the residual has a normal distribution curve and no data transformation is required. If the data is not normally distributed, you can adopt non-parametric tests that do not require a distribution to meet the required assumption to be analyzed (Boukhatem, Ftiti, & Sahut, 2021).

3.8.2 Multicollinearity Test

Multicollinearity is defined as the degree of inter-correlation between independent variables in a multivariate regression equation (Pesaran, 2015). It is most frequently used with time series data. The independent variables in any regression analysis are assumed to be uncorrelated. If the independent variables are found to be highly correlated, then there is a necessity for model re-arrangement. The study adopted the Variance Inflation Factor (VIF) to determine whether multicollinearity exists or not. If the VIF limits exceed 10 and the tolerance not close to one, then multicollinearity exists, hence one of the highly correlated variables ought to be dropped (Barnor, 2014).

3.8.3 Heteroscedasticity Test

Before estimating the model, the data was examined for heteroscedasticity. The assumption of regression analysis is that the residuals should have a constant variance or be homoscedastic. It is said to be heteroscedastic if the error terms between different values of explanatory variables do not have a constant variance. When using heteroscedastic values in a regression model, it is possible to get biased parameter estimates and inaccurate standard errors (Cooper & Schindler, 2011).

To check for heteroscedasticity among error terms, the Breusch-Pagan-Godfrey statistical test was used. A p value less than 0.05 showed the presence of non-uniform variance. The null hypothesis assumes a homoscedastic error term, while the alternative hypothesis assumes a heteroscedastic error term. If the null hypothesis is rejected, heteroscedasticity is presumed to exist. As a result, the data was transformed into a logarithm (Uyanto, 2019).

3.8.4 Auto Correlation test

The correlation between the values of a variable and the time lagged values of the same variable is known as autocorrelation. This is a circumstance in which the historical values of a time series of data influence it. Auto correlation has the drawback of making a model appear better than it is. According to Kandananond (2012), autocorrelation would most likely result in invalid results. The Ljung-Box Q test statistical method was used in this study for testing auto correlation. The Ljung-Box Q test are examples of asymptotic (large sample) tests. These methods are applicable whether the dependent variable is lagged or not.

If the auto correlated error terms are identified, one of the first steps in correcting the problem should be to look into the omission of a key predictor variable. If such a predictor does not help to reduce or eliminate autocorrelation in the error terms, then transformations on the variables can be performed. Autocorrelation is said to be present in a variable if the p-values are greater than 0.5 (Barnor, 2014).

3.8.5 Granger Causality Test

Granger causality is a statistical hypothesis test that determines if one-time series may be used to predict another. It was conducted in the study to evaluate whether the variables under study could be used to predict each other or not. The variables in the model were examined to see if there was a bidirectional or unidirectional causal relationship between them (Vaidya, 2021).

Granger causality is used to assess the relationships between independent and dependent variables. This study assumed that macroeconomic variables had causality with the growth of bond markets in Kenya. The null hypothesis (H_0) states that: Y_t does not Granger cause X_{t+1} and the alternate hypothesis (H_1) states that: Y_t Granger causes X_{t+1}, implying that at least one of Y's lags is significant. If the p-values for at least one of the lags are less than a significance level (0.05), reject the null hypothesis (Pesaran, 2015).

3.8.6 Co-integration Test

Ariemba, Mboya and Kamau (2015) argue that co-integration is an estimate of the statistical property of variables expressed in terms of time series. If there is a stationary linear combination of non-stationary random variables, the variables in a model are said to be co-integrated. The co-integration test was conducted using the Johansen-Juselius method. The purpose of a co-integration test is to see if, despite the fact that some of the variables are non-stationary separately, their linear combination is stationary 1 (0).

The Johansen-Juselius test was chosen because of its convenience to use when there are more than two variables. The rule of thumb is that if two or more series are non-stationary on their own, but a linear combination of the time series is stationary, the series are said to be co-integrated (Hakim, 2014).

3.8.7 Stationarity Test

The statistical property of time series data that its mean and variance do not fluctuate over time is known as stationarity. Non-stationary series can cause spurious

regression, in which the model's results appear good but are nonsensical. A false regression would emerge from a regression analysis performed on non-stationary data (Shrestha & Bhatta, 2018). The Augmented Dickey-Fuller (ADF) unit root test, which is a standard unit root test, is employed to test stationary units in this study.

If the ADF on a variable sequence was two or greater, the series was considered stationary. If ADF is less than two, the series is considered non-stationary, unless stationary is achieved via first or second differentiation. The null hypothesis presumes that the data has a unit root. The alternative hypothesis holds that the data lacks a unit root (Paparoditis & Politis, 2018).

If the null hypothesis was accepted, the data would be non-stationary, and it would be necessary to difference the data before running a regression to make the series stationary. The data series was denoted as I (0), or integrated of order 0, if it was stationary without any differencing. If a series was stationary at the first difference, it was given the notation I (1), or integrated of order one (1) (Ajewole, Adejuwon & Jemilohun, 2020).

3.9 Operationalization of Variables

The operationalization of the variables is a system that aids in identifying relationship between variables and explaining how such relationships can be estimated (Ongore & Kusa, 2013).

Table 3.2: Summary of Operationalization of Key Variables

Variable / (Nature)	Measure	Converted Indicator	Variable Definition /Computation	Data Type	Source
Inflation rate (Independent variable)	Consumer price index	In log	A measure on inflation using an index of items consumed on day-to-day basis. Used monthly average figures.	Secondary	KNBS (Monthly Data)
Interest rate (Independent variable)	Commercial Bank lending rate	In log	The monthly changes in the lending & borrowing rate.	Secondary	CBK (Monthly Data)
Exchange rate (Independent variable)	Kenya shilling to US Dollar	In log	The prevailing exchange rate at the end of every month under study. Number of shillings exchanged for 1 US dollar.	Secondary	CBK (Monthly Data)
GDP (Independent variable)	Income of the country	In log	Total value of all goods and services produced over a given period of time.	Secondary	CBK (Quarterly Data)
Diaspora Remittance (Moderating variable)	Value of Remittance	In log	Total value of money or goods that are transmitted to households by migrant workers working outside their country of origin.	Secondary	KNBS (Monthly Data)
Growth of Bond market (Dependent variable)	Value of the Bond Market	In log	Percentage change of the value of bond market.	Secondary	NSE (Monthly Data)

Source: (CBK, 2020; NSE, 2020; KNBS, 2020)

3.9.1 Inflation Rate

The study established the effect of changes in the inflation rate and growth of bond markets in Kenya. The Consumer Price Index (CPI) monthly average percentage change was employed as a measure of inflation in the study. The Consumer Price Index (CPI) is a Kenyan index that measures average price changes in consumer goods (Omotor, 2010). It is also a macroeconomic indicator that is used to monitor price movements and how they affect policy decisions (KNBS, 2010). CPI is a weighted average of prices for items consumed that is taken on a regular basis at various locations within a given economy. The data used was obtained from the data provided by the Kenya National Bureau of Statistics.

3.9.2 Interest Rate

The study investigated the influence of interest rates on the bond market growth in Kenya. The study used the commercial bank lending rate as a measure of interest rate, which is the rate charged by commercial banks on loans made to individuals and corporations. Investors in the bond market consist of individuals and corporations. The study used monthly averages of commercial bank lending rates over a period of 20 years. The data used was obtained from the Central Bank of Kenya.

3.9.3 Exchange Rate

The exchange rate refers to the rate at which domestic currency trades against foreign currency. The exchange rate was measured by the monthly changes in the buying rate of a US dollar against the Kenyan shilling. Based on Dornbusch and Fischer's (1980) approach, a depreciation of the domestic currency makes exporting goods attractive, increases foreign demand, and hence revenue for local firms appreciates. Conversely, appreciation of the local currency reduces profits for an exporting firm and thereby affects the value of its stock negatively. The exchange rate is measured by the monthly average exchange rate at which Kenya shillings are exchanged for one US dollar. The data used in this study was obtained from the data provided by the Central Bank of Kenya.

3.9.4 Gross Domestic Product

The Gross Domestic Product (GDP) is a measure of the market value of all final goods and services produced in a country over a specific time period. It is most frequently used in measuring a country's economic performance and is widely utilized as an indicator for the performance of a country's economy. A significant increase in GDP signifies economic expansion, while a significant decrease suggests a downturn. The monthly income of the country was used as a measure of GDP in the study, which was obtained from the Kenya National Bureau of Statistics (Ongore & Kusa, 2013).

3.9.5 Diaspora Remittance

A foreign worker's remittances are the transfer of money from his or her home country. Through their economic and social linkages, diaspora remittance can have a significant effect on their countries of origin (Usman, 2019). Diaspora remittances are experiencing growth and, due to the huge sums involved, are now being recognized as an important contributor to the recipient country's growth and development (Amugune, 2018). The study obtained monthly data for the value of the remittances from the Central Bank of Kenya (CBK).

3.9.6 Growth of Bond Market

The bond market offers a perfect alternative that the private and public sector can use to finance long-term projects such as the development of infrastructure and housing, as well as financing government debts. Besides that, since the introduction of the bond market, there has been increased partnership in the development process between the private sector and the government (Ngugi & Agoti, 2009). The bond market's growth is measured by the monthly percentage change in the value of the bond market. The data for this study was obtained from the Nairobi Security Exchange.

3.10 Data Processing and Analysis

The research variables were analyzed using quantitative data analysis methodologies. Before being evaluated with the stata software, the data was cleaned, categorized, coded, modified, and summarized. In order to analyze the data, the researcher used both descriptive and inferential statistics. The mean, percentages, mode, median, variance, and standard deviation are all descriptive statistics.

The data in this section was analyzed using multiple regression models and time series models. The study focuses on macroeconomic variables (inflation rate, interest rate, exchange rate, and gross domestic product) and bond market growth in Kenya, with diaspora remittance serving as a moderating component. The study tests the relationship between macroeconomic variables, diaspora remittance and the growth of bond market at 95% confidence interval. Time series regression equations were also used to guide the analysis, as shown below;

The time series regression models for this study were:

Model I (without moderating variable interaction)

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

Model 2 (with moderating variable interaction)

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 Z_{1t} + \beta_6 Z_{1t} {}^* X_{1t} + \beta_7 Z_{1t} {}^* X_{2t} + \beta_8 Z_{1t} {}^* X_{3t} + \beta_9 Z_{1t} {}^* X_{4t} + \varepsilon_t$$

Where:

B_0 = Constant term (intercept)

β – Parameters to be estimated while β_1, β_2, β_3 and β_4 are the coefficient functions of the independent variables.

Y_t = Bond Market Growth at time t.

X_{1t} is the inflation rate as measured by the consumer price index at time t

X_{2t} = Interest rate as measures by consumer bank lending rate at time t.

X_{3t} is Exchange Rate measured by the exchange rate between Kenya shilling and one US dollar Exchange Rate at a time t.

X_{4t} is the Gross Domestic Product at time t.

Z_{1t} is the diaspora remittances at time t

ε_t = Error term or Stochastic error at time t

3.11 Data Presentation

The data was classified accordingly, in line with the objectives of the study. The coded, classified, and tabulated data were subjected to quantitative analysis. Quantitative data analysis is helpful in data estimation because it provides quantifiable and easily understandable results. Quantitative data was analyzed in a variety of ways that could help the researcher meet the set objectives (Newing, Eagle, Puri, & Watson, 2011). In this study, data was presented through statistical techniques including tables, bar charts, and line graphs.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents research findings and outcomes of data analysis using the methodology stated in chapter three. It includes the analysis of the collected data and discussion of the results. The chapter presents findings with regards to the macro-economic variables under the study and the growth of bond market. Further, the study sought to explore the moderating influence of diaspora remittance on the relationship between macroeconomic variables in the study and the growth of bond market.

The chapter is arranged in the following order; introduction, economic period observations, descriptive statistics, diagnostic tests and regression analysis. The study's findings are based on descriptive and inferential statistics derived from secondary data on all the variables studied. The empirical and theoretical literature in the study was used to identify areas of agreement or disagreement with the research findings. Data was presented in the form of tables, line graphs, scatter diagrams, and frequency histograms in relation to the research design and specific objectives of the study.

4.2 Economic Period Observations

Secondary data obtained from the Nairobi Securities Exchange (NSE), Kenya National Bureau of Statistics (KNBS) and Central Bank of Kenya (CBK) was used in this study to examine the relationship between macroeconomic variables, diaspora remittance and bond market growth in Kenya. Time series data for a period of 20 years was used in the study. The study period ranges from January 2001 to December 2020 comprising of 240 monthly observations for each of the independent variables out of a possible 240 observations.

4.3 Descriptive statistics

Descriptive statistics are presented in this section to show the basic features of the data obtained in the study. A set of standard statistics was employed in this preliminary report to examine the general characteristics of each study variable. The subsequent combination of the study variables was executed to produce reliable results. Furthermore, the study conducted descriptive analysis to determine the mean, median, standard deviation, maximum and minimum values.

The mean is the average value of the series, obtained by adding up the series and dividing it by the number of observations. The median is the middle value (or average of the two middle values) of the series when the values are ordered from the smallest to the largest. The maximum and minimum values are the highest and lowest values in the series in the current sample. A standard deviation is a measure of dispersion or spread in a series. The coefficient of Variation (CV) shows the extent of variability of data in a sample in relation to the mean of the population (Aman, Isa & Naim, 2020). Table 4.1 below shows the summary of descriptive statistics for the study variables.

Table 4.1: Summary of Descriptive statistics for the Study Variables

Statistic	Growth of Bond Market (In log GBM)	Inflation Rate (In log INF)	Interest Rate (In log INT)	Exchange Rate (In log EX)	Gross Domestic Product (In log GDP)	Diaspora Remittance (In log DR)
Mean	23.04	4.62	2.73	4.42	14.59	22.32
Median	23.32	4.65	2.68	4.38	14.93	22.14
Maximum	25.44	5.32	3.23	4.65	15.49	24.12
Minimum	20.00	3.84	2.48	4.12	13.23	20.74
Std. Dev.	1.48	0.45	0.17	0.13	0.64	0.95
CV	0.064	0.097	0.062	0.029	0.044	0.043
Skewness	-0.35	-0.10	0.63	0.23	-0.20	0.12
Kurtosis	1.78	1.66	2.42	2.10	1.38	1.73
Jarque-Bera	19.84	18.16	19.27	10.23	27.70	16.70
Probability	0.00	0.00	0.00	0.00	0.00	0.00
Observations	240	240	240	240	240	240

4.3.1 Growth of Bond Market

A total of 240 monthly observations were made on the bond market growth for a period of 20 years. The bond market growth as indicated in table 4.1 had a mean of 23.04 and a median of 23.32 over the study period. Standard deviation of 1.48 was recorded indicating low deviation of the data points from the mean. The study recorded coefficient of variation of (0.064) meaning the research data was precise.

The bond market growth variable was negatively skewed (-0.35), which implies that from the mean, there are more data points on the upper side than the lower side. The kurtosis is 1.78, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.00, which is insignificant and below 0.05, indicating that the data is not normally distributed.

Figure 4.1 below depicts the bond market growth profile in Kenya for the entire period of the study between the year 2001 and 2020. The minimum and maximum values recorded were 20.00 and 25.44 respectively. This study corroborates with the findings of Githinji (2011) who investigated the impact of macroeconomic variables on bond market development in Kenya who also reported low standard deviation.

The trend shows that the bond market growth was lowest in March 2005.This can be attributed by a decrease in investor participation in the market. This may have been occasioned by the political instability resulting from the Wako draft 2005 new constitution referendum political campaigns that took place in March to May in the same year (Kramon, & Posner, 2011).

The highest growth of bond market was witnessed in June 2010. This can be attributed by increase in investor shift to the bond market as they sought to maximize on their portfolios. This is in line with a World Bank report done by Wolfgang Fengler, in June 2010 revealing that Kenya's economy was recovering steadily. At the same time Kenya depicted strong macroeconomic environment resulting continued good governance (Devarajan, & Fengler, 2013).
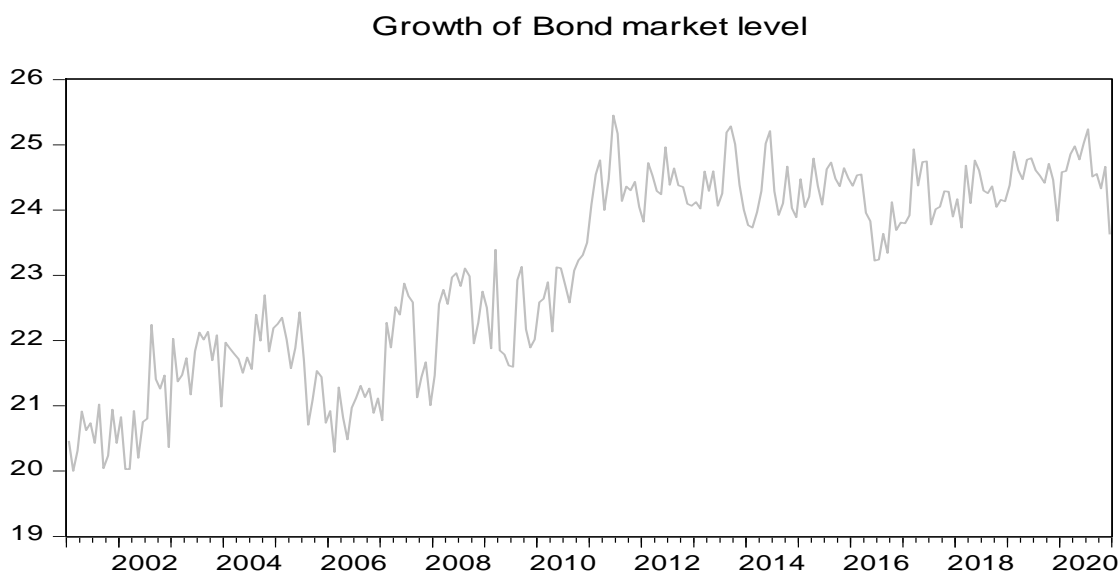
Figure 4.1: Growth of Bond Market Trend Graph at Level

**Bond Market Growth Graph after Differencing**

Figure 4.2 presents the graphical representation of the growth of bond market after differencing. The differenced data shows that the value is slightly stable since the values are closer to the mean of zero. The graph below indicates that the plotted line crosses the zero line more frequently, which implies that the noise effect in the variable is reduced significantly. This means that after the first difference, both the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.

Differenced Growth of Bond market
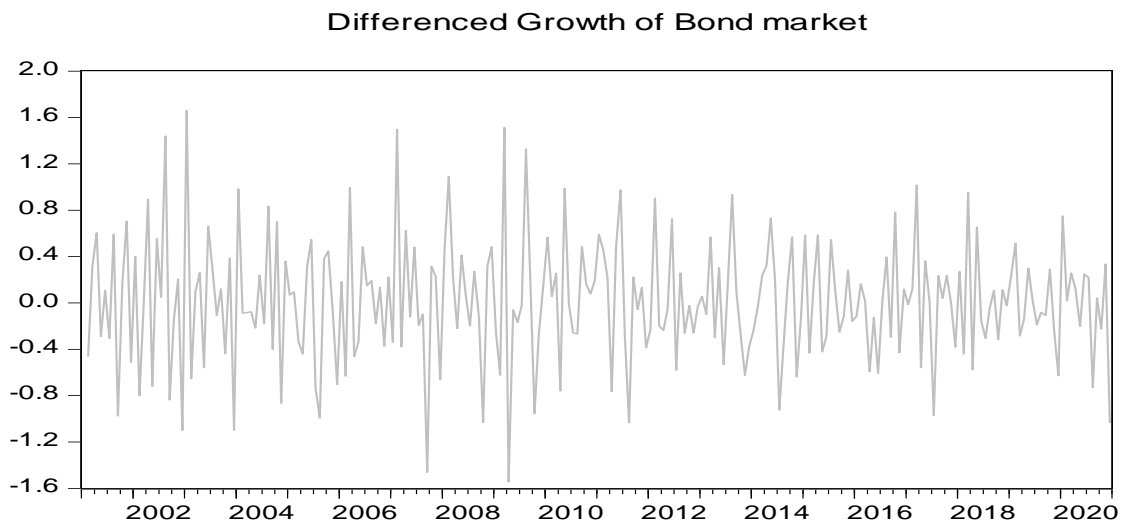
Figure 4.2: Bond Market Growth Trend Graph at First Difference

Bond Market Growth Box Plot

Figure 4.3 presents the results on the bond market growth box plot. It can be observed that the variable has a mean of 23.04 and a distribution that is strong towards the upper side of the dispersion graph. However, there are no extreme outliers for the variable on observation.

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Bond Market Growth

Observations in log form
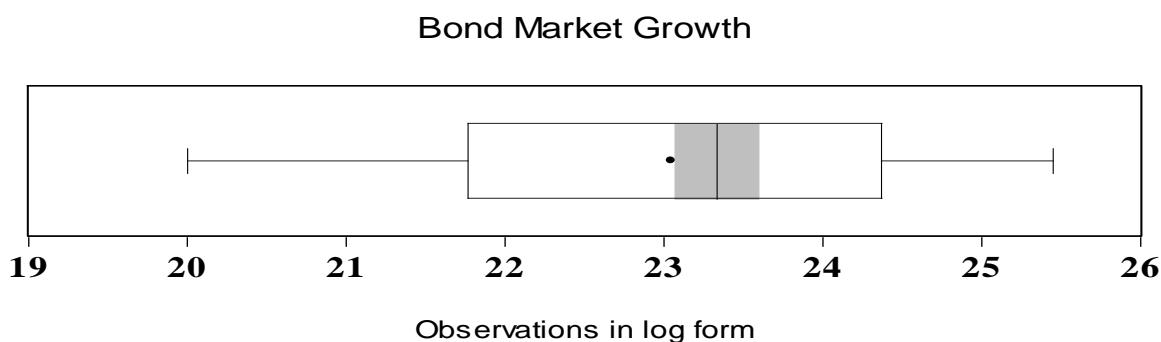
Figure 4.3: Bond Market Growth Box Plot.

4.3.2 Inflation Rate

A total of 240 monthly observations were made on the inflation rate for a period of 20 years. The inflation rate, as indicated in table 4.1, had a mean of 4.62 and a median of 4.65 over the study period. A standard deviation of 0.45 was recorded, indicating a low deviation of the data points from the mean. The study recorded a coefficient of variation of 0.097, meaning the research data was precise.

Inflation rate was negatively skewed (-0.10), which implies that from the mean, there are more data points on the upper side than the lower side. The kurtosis is 1.66, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.000, which is insignificant and below 0.05, indicating that the data is not normally distributed. The study disagrees with the findings of Ngaruiya and Njuguna (2016) who investigated on inflation and bond yield between the years 2008 to 2012.

Figure 4.4 depicts the inflation rate profile in Kenya for the entire period of the study between the years 2000 and 2019. The minimum and maximum values recorded were 3.84 and 5.32, respectively. The trend shows that the inflation rate was the lowest in the January 2002, March 2007 and November 2012. This can be attributed to high political instability caused by agitation of the multiparty agenda and also because donors were withdrawing from government support. The highest inflation rate was recorded in the December 2018. This can be attributed to government overspending on the agenda 4 development scheme that brings excess money into the

market (Koper, 2018). There was a lot of money leaving the government through high profile corruption deals (Oxford Analytica, 2019).

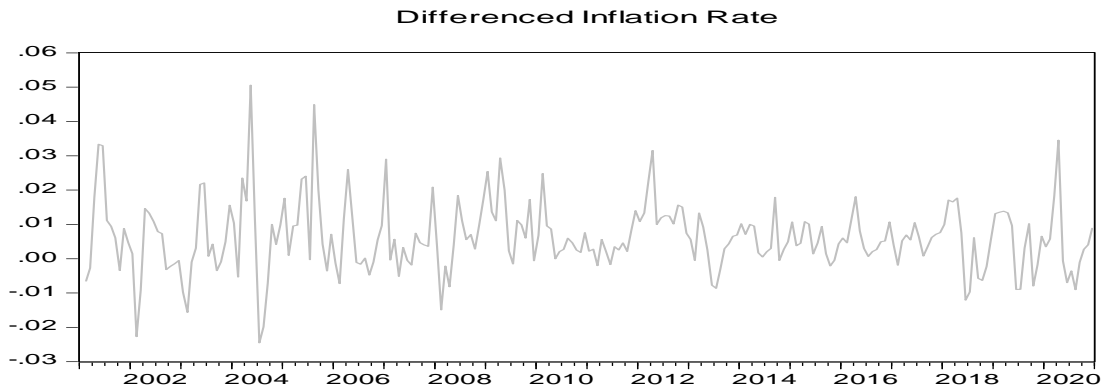Figure 4.4 shows the trend graph of the inflation rate at each level.

Inflation Rate Level

Figure 4.4: Average Monthly Inflation Rate Trend Graph at Level

Inflation Rate Trend Graph after Differencing.

Figure 4.5 presents the graphical representation of the inflation rate after differencing. The differenced data indicates that the value is slightly stable since the values are closer to the mean of zero. The graph below shows the plotted line crosses the zero line more frequently which implies that the noise effect in the variable is reduced significantly. This means that after the first difference the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.

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Differenced Inflation Rate

Figure 4.5: Average Monthly Inflation Rate Trend Graph at First Difference

Inflation Rate Box Plot

Figure 4.6 presents the results of the inflation box plot, from which it can be observed that the variable has a mean of 4.62 and a distribution that is strong towards the upper side of the dispersion graph. However, there are no extreme outliers observed for the variable.
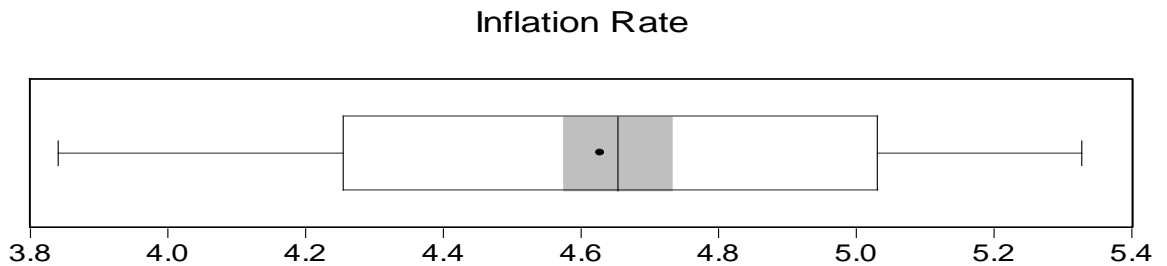

Inflation Rate

Figure 4.6: Inflation Rate Box Plot

4.3.3 Interest Rate

A total of 240 monthly observations were made on interest rate for a period of 20 years. The interest rate as indicated in table 4.1 had a mean of 2.73 and a median of 2.68 over the study period. Standard deviation of 0.17 was recorded indicating low deviation of the data points from the mean. The study recorded coefficient of variation of 0.062 meaning the research data was precise.

Interest rate was positively skewed (0.63), which implies that from the mean, there are more data points on the lower side than the upper side. The kurtosis is 2.42, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.000, which is insignificant and below 0.05, indicating that the data is not normally distributed.

Figure 4.7 below depicts the interest rate profile in Kenya for the entire period of the study between the year 2000 and 2019. The minimum and maximum values recorded were 2.48 and 3.23 respectively.

The trend shows that the interest rates between 2016 and 2019 continuously recorded low values that could be attributed to the introducing of interest rate capping by the government. The highest interest rate was witnessed in the year 2012. This occurred as result of enhanced economic stability in the financial and resilience of economic performance in Kenya. More so, this may have been caused by the anticipated general election in early 2013 (Nguthi, 2013). Figure 4.7 shows the trend graph of interest rate.
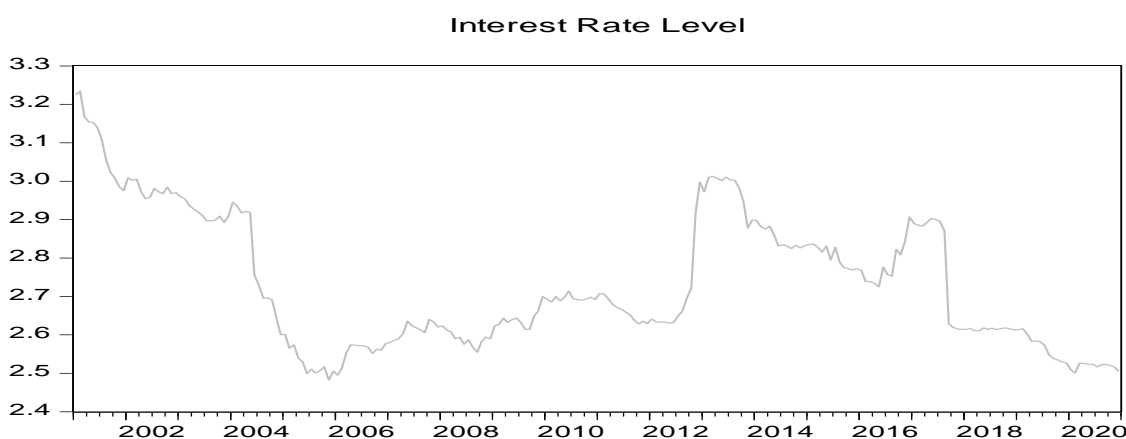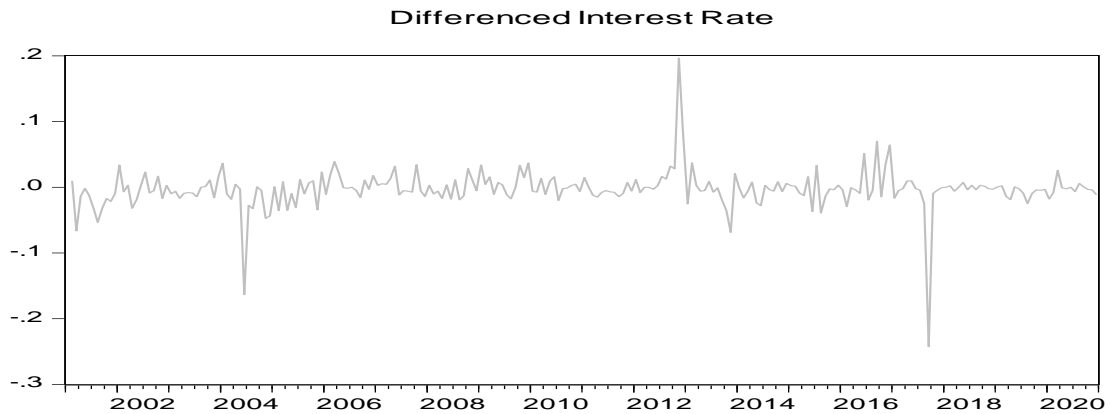

Figure 4.7: Average Monthly Interest Rate Trend Graph at Level

Interest Rate Trend Graph after Differencing.

Figure 4.8 presents the graphical representation of interest rate after differencing. The differenced data show that the value is slightly stable since the values are closer to the mean of zero. From figure 4.8 the plotted line crosses the zero line more

frequently which implies that the noise effect in the variable is reduced significantly. This means that after the first difference the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.

Figure 4.8: Average Monthly Interest Rate Trend Graph at First Difference

Interest Rate Box Plot

Figure 4.9 presents the results on interest rate box plot where it can be observed that the variable has a mean of 2.73 and a distribution that is strong towards the lower side of the dispersion graph. However, there are no extreme outliers for the variable on observations.

Figure 4.9: Interest Rate Box Plot

4.3.4 Exchange Rate

A total of 240 monthly observations were made on exchange rate for a period of 20 years. The exchange rate as shown in table 4.1 had a mean of 4.42 and a median of 4.38 over the study period. Standard deviation of 0.13 was recorded indicating low deviation of the data points from the mean. The study recorded coefficient of

variation of 0.029 meaning the research data was precise. The graph below depicts the exchange rate profile in Kenya for the entire period of the study between the year 2000 and 2019. The minimum and maximum values recorded were 4.12 and 4.65 respectively.

Exchange rate variable was positively skewed (0.23), which implies that from the mean, there are more data points on the lower side than the upper side. The kurtosis is 2.10, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.00, which is insignificant and below 0.05, indicating that the data is not normally distributed

The trend shows that the exchange rate was lowest in March 2008 meaning that the Kenyan shilling had the highest deprecation in value that month. This could be due to low dollar demand as a result of poor business activity in the country during and after the post-election violence (Linke, 2019). The trend shows that the exchange rate was highest in October 2011 meaning that the Kenyan shilling had the highest appreciation in value that month. That may be caused by poor economy in the country and this period was just before the general election. Figure 4.10 below shows bond market growth trend over the study period.
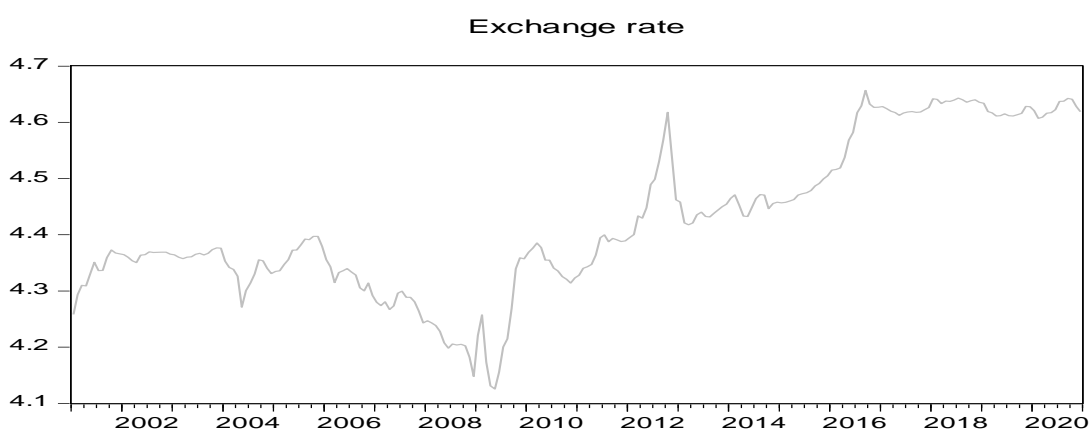
Figure 4.10: Average Monthly Exchange Rate Trend graph at Leve

**Exchange Rate Trend Graph after Differencing.**

Figure 4.11 presents the graphical representation of exchange rate after differencing. The differenced data show that the value is slightly stable since the values are closer to the mean of zero. From figure 4.11, the plotted line crosses the zero line more frequently which implies that the noise effect in the variable is reduced significantly. This means that after the first difference the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.

Differenced exchange rate
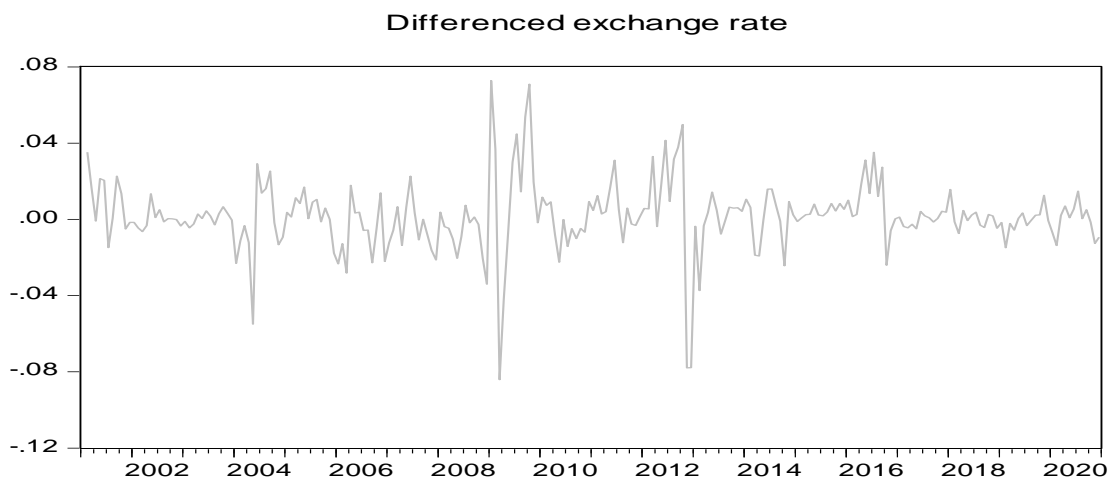
Figure 4.11: Average Monthly Exchange Rate Trend Graph at First Difference

Exchange Rate Box Plot

Figure 4.12 presents the results on bond market growth box plot it can be observed that the variable has a mean of 4.4 and a distribution that is strong towards the upper side of the dispersion graph. However, there are no extreme outliers for the variable on observations.
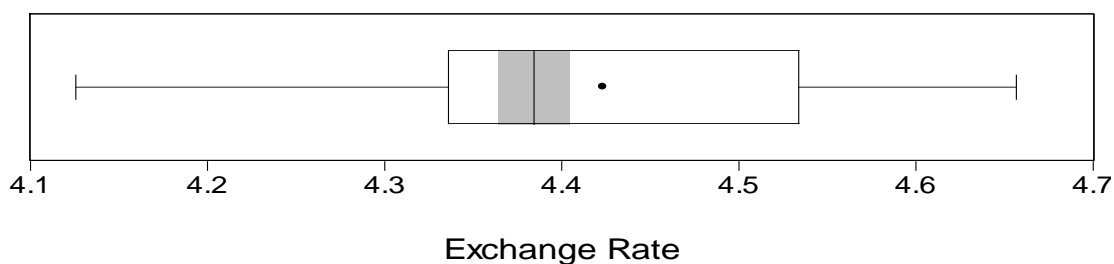
Figure 4.12: Exchange Rate Box Plot

4.3.5 Gross Domestic Product

The study obtained quarterly data for the income of a country and interpolated the data for the 20 years' study period. A total of 240 monthly observations were made on the gross domestic product for a period of 20 years. The gross domestic product as indicated in table 4.1 had a mean of 14.59 and a median of 14.93 over the study period. Standard deviation of 0.64 was recorded indicating low deviation of the data points from the mean. The study recorded coefficient of variation of 0.044 meaning the research data was precise.

Exchange rate variable was negatively skewed (-0.20), which implies that from the mean, there are more data points on the upper side than the lower side. The kurtosis is 1.38, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.000, which is insignificant and below 0.05, indicating that the data is not normally distributed.

Figure 4.1 below depicts the gross domestic product profile in Kenya for the entire period of the study between the year 2000 and 2019. The minimum and maximum values recorded were 13.23 and 15.49 respectively. The findings agree with that of Githinji (2013) who conducted a study in Kenya between 2008 and 2012 that recorded a low standard deviation.

The trend shows that the gross domestic product was lowest in the march 2001. This could have been contributed by high inflationary rate experienced in Kenya during that period. The gross domestic product dropped in December 2007 to March 2008 immediately after Kenya had experience one of the worst post-election violence. The

highest gross domestic product was witnessed in February 2019. This can be attributed to growth in productivity in the country. Figure 4.13 shows bond market growth trend over the study period.

Figure 4.13: Extrapolated Monthly Average for the Gross Domestic Product at Level.

**Gross Domestic Product Graph after Differencing.**

Figure 4.14 presents the graphical representation of Gross Domestic Product after differencing. The differenced data show that the value is slightly stable since the values are closer to the mean of zero. From figure 4.14 below the plotted line crosses the zero line more frequently which implies that the noise effect in the variable is reduced significantly. This means that after the first difference the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.
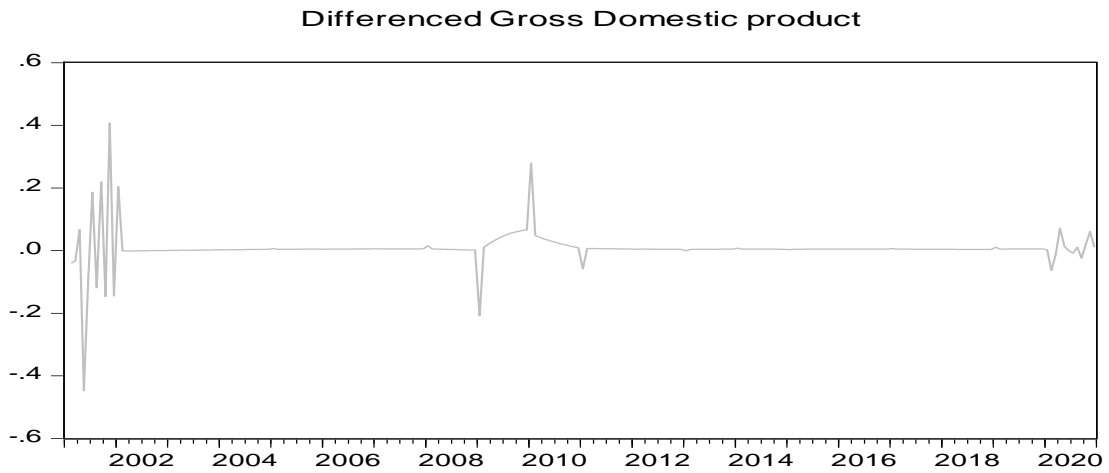
Figure 4.14: Extrapolated Monthly Average for the Gross Domestic Product at First Difference.

Gross Domestic Product Box Plot

Figure 4.15 below presents the results on GDP box plot it can be observed that the variable has a mean of 14.5 and a distribution that is strong towards the left side of the dispersion graph. However, there are no extreme outliers for the variable on observations. Majority of observations are between 14.5 and of 15.06.
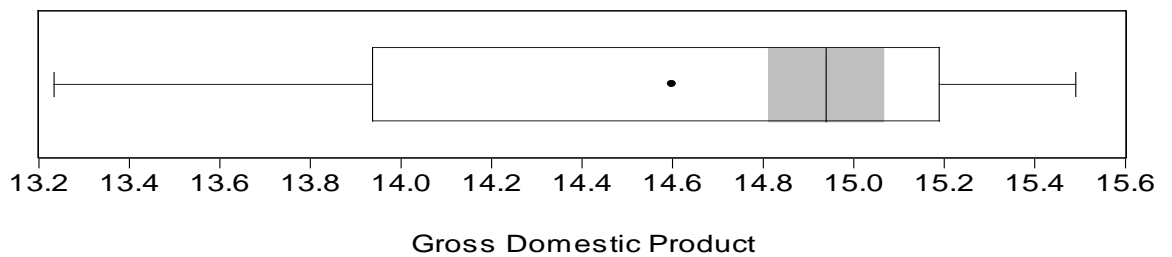
Figure 4.15: Gross Domestic Product Box Plot

4.3.6 Diaspora Remittance

A total of 240 monthly observations were made on the diaspora remittance for a period of 20 years. The diaspora remittance as indicated in table 4.1 had a mean of 22.32 and a median of 22.14 over the study period. Standard deviation of 0.95 was

recorded indicating low deviation of the data points from the mean. The study recorded coefficient of variation log of 0.043 meaning the research data was precise.

Diaspora remittance was positively skewed (0.12), which implies that from the mean, there are more data points on the lower side than the upper side. The kurtosis is 1.73, which is below the cutoff value of 3. Further, the p-value from the Jarque-Bera was 0.000, which is insignificant and below 0.05, indicating that the data is not normally distributed.

Figure 4.16 below depicts the diaspora remittance profile in Kenya for the entire period of the study between the year 2000 and 2019. The minimum and maximum values recorded were 20.74 and 24.12 respectively. Figure 4.16 below shows bond market growth trend over the study period.

The trend shows that the diaspora remittance was lowest in the March 2001.This can be attributed to different problems associated to lack of access to financial institutions, the presence of informal transfers and the cost of remitting. The highest diaspora remittance was witnessed in April 2018. This can be attributed to technological and financial innovations that provided Kenyans in the diaspora more convenient channels for their transactions (Muthinja, & Chipeta, 2018).
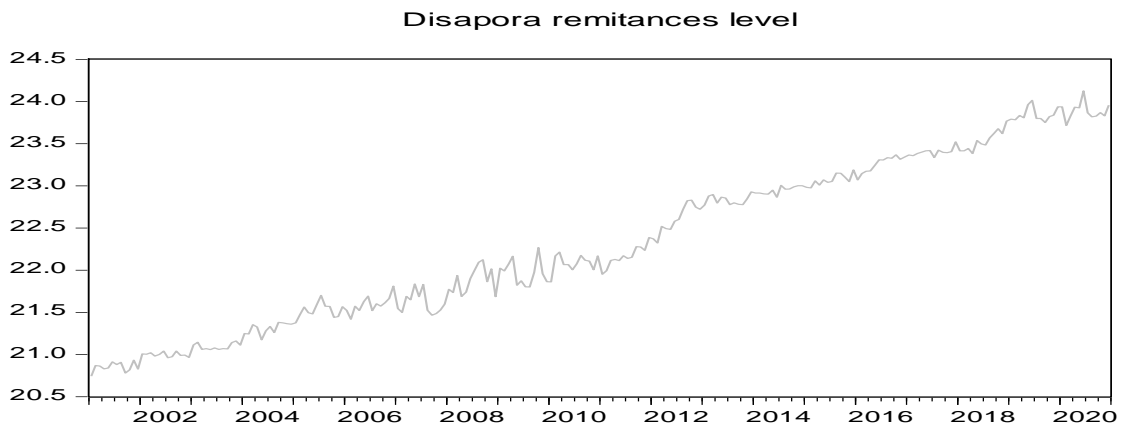
Figure 4.16: Average Monthly Diaspora Remittances Trend at Level

**Diaspora Remittances Trend graph at First Difference.**

Figure 4.17 presents the graphical representation of diaspora remittance after differencing. The differenced data show that the value is slightly stable since the values are closer to the mean of zero. From figure 4.17 below the plotted line crosses the zero line more frequently which implies that the noise effect in the variable is reduced significantly. This means that after the first difference the mean and the variance are stabilized. Consequently, this improves the accuracy of any estimates calculated from it.
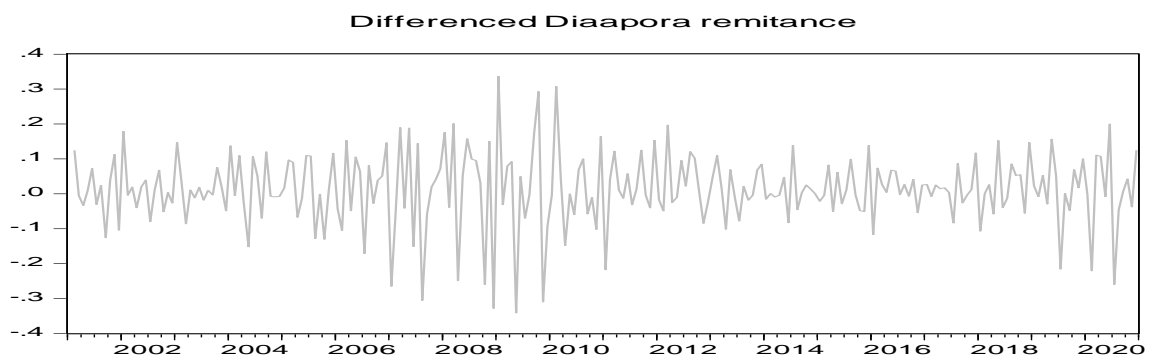
Figure 4.17: Average Monthly Diaspora Remittances Trend at First Difference

Diaspora Remittances Test Box Plot

Figure 4.18 presents the results on diaspora remittances box plot it can be observed that the variable has a mean of 22.3 and a distribution that is strong towards the left side of the dispersion graph. However, there are no extreme outliers for the variable on observations. Majority of observations are between 22.0 and 22.3.
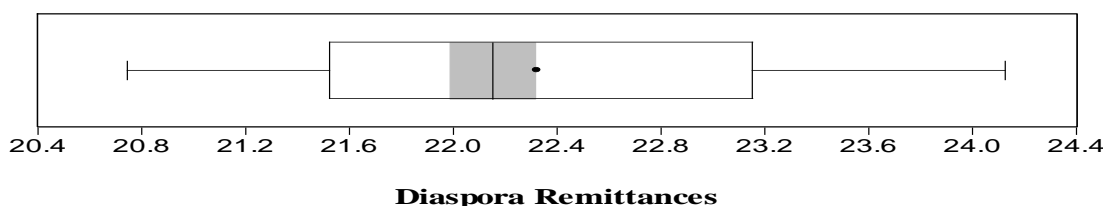
Figure 4.18: Diaspora Remittances Test Box Plot

4.4 Model Diagnostic Tests

Diagnostic assessments were conducted before data analysis for the assurance that the secondary data collected fulfill main expectations of the statistical measures followed. Before conducting model estimation, it` is necessary to carry out preliminary tests to ensure that Classical Linear regression model assumptions are not violated. These tests were assessed to avoid bias, inefficient and inconsistent of Parameter estimates (Gujarati, 2003). The model diagnostic tests conducted in this study includes the following; normality test, stationary test, autocorrelation test, heteroscedasticity test, multicollinearity test, cointegration test, ARIMA Tests and granger causality tests
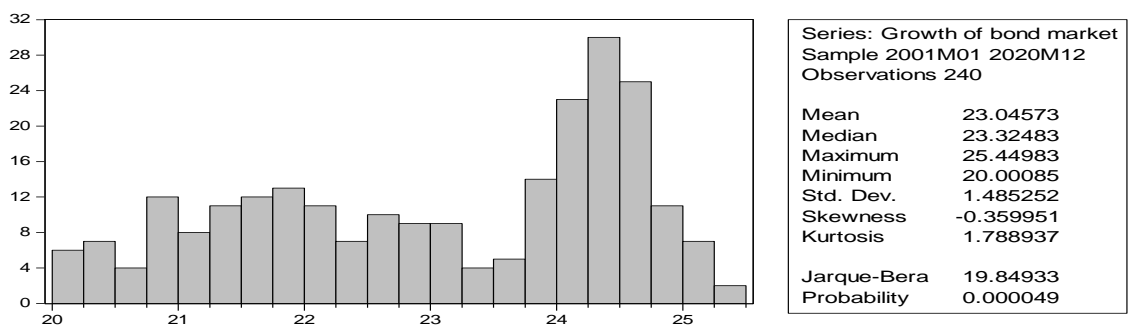
4.4.1 Normality Test

The study used the Jarque-Bera statistical method for normality test. The reason for using this test was because of asymptotic test dedicated to ordinal least square and it captures both skewness and kurtosis. Skewness is a measure of asymmetry of the distribution of the series around its mean. Positive skewness means that the distribution has a long right tail and negative skewness implies that the distribution has a long-left tail. Kurtosis measures the peakedness or flatness of the distribution series.

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For a normal distribution data, the skewness and kurtosis must be 0 and 3 respectively. The rule of thumb states that if the probability value for Jarque Bera is greater than 0.05, the study failed to reject the null hypothesis and therefore it is concluded that the residual takes normal distribution curve (Tabachnick & Fidell, 2007).
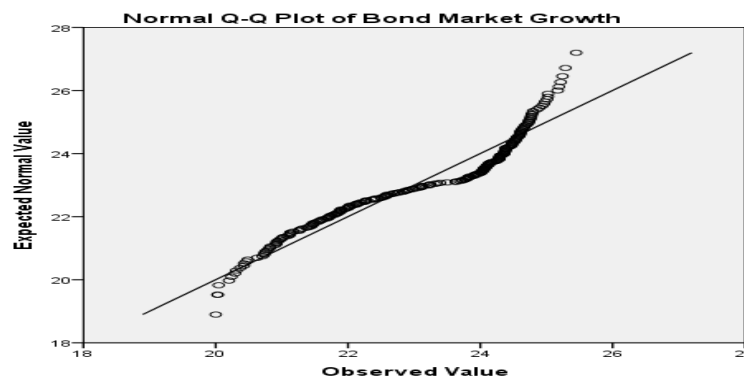
Normality Tests of Bond Market Growth

Figure 4.19 shows the output results of normality test of the data. From the results, it can be observed that bond market growth variable is negatively skewed (-0.35995). This implies that, from the mean value there are more data points to the lower side than the upper side. The output also reveals that the kurtosis is 1.788937 which is below the cut of value of 3. Further, the p-value from the Jarque-Bera was 0.000049 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution was rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary. The study agrees with the findings of Nkwede (2017) in Nigeria, who also used the Jarque Bera statistical method and found that data was not normally distributed. This implies that our study is plausible.

Figure 4.19: Normality Test Results of Bond Market Growth

Normal Q-Q Plot of Bond Market Growth

Figure 4.20 below presents the graphical illustration of bond market growth quantiles of normal. From the results above it can be concluded that the majority of the observations in the middle lie along the main diagonal line except those at the end. These output shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.

Figure 4.20: Normal Q-Q Plot of Bond Market Growth

Other Normality Confirmatory Tests

The study carried out further confirmatory tests on bond market growth to establish authenticity of the Jarque-Bera statistical test. The four tests employed were Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. From the four tests of normality carried out there was no evidence of normality for the bond market growth. This implies that the dependent variable is not normally distributed since the null hypothesis of normality was rejected. This was supported since the p-values were found to be less than 0.05.

Table 4.2: Normality Test Results for Bond Market Growth

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.153234	NA	0.0000
Cramer-von Mises (W2)	1.201355	1.203858	0.0000
Watson (U2)	1.157157	1.159568	0.0000
Anderson-Darling (A2)	6.909997	6.931861	0.0000

Normality Tests of Inflation Rate

Figure 4.21 shows the output results of normality test for the residuals. From the results, it is observed that inflation rate variable is negatively skewed (-0.100180). This implies that from the mean value there are more data points to the lower side than the upper side. The output also reveals that the kurtosis is 1.667016 which is below the cut of value of 3.

Further, the p-value from the Jarque-Bera was 0.000113 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution can be rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary.
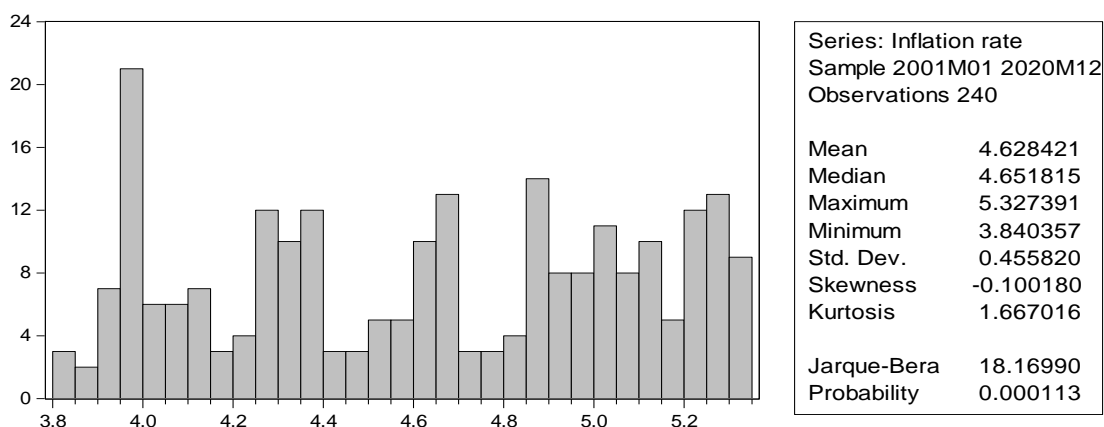
Figure 4.21: Inflation Rate Distribution Graph

Normal Q-Q Plot of Inflation Rate

Figure 4.22 presents the graphical illustration of the inflation rate quantiles of normal. From the results above it can be concluded that the majority of the observations in the middle lie along the main diagonal line except those at the end. These output shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.
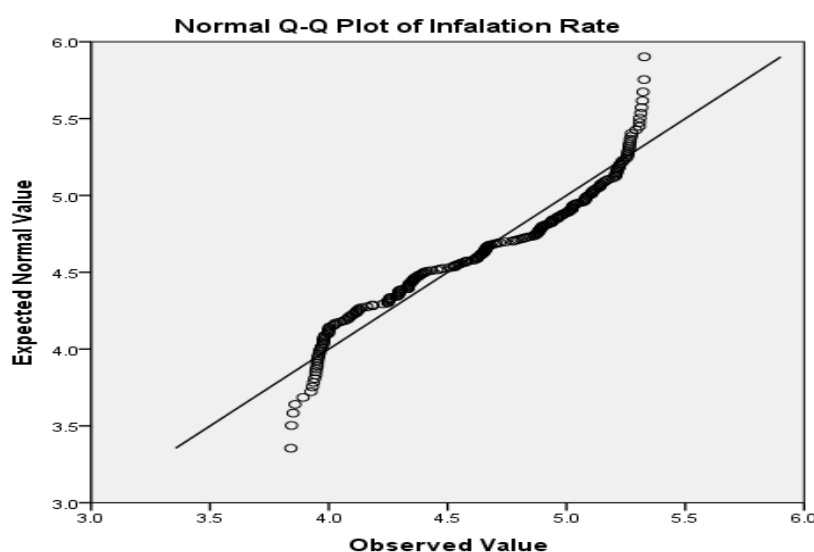
Figure 4.22: Normal Q-Q plot of Inflation Rate

Other Confirmatory Normality Tests of Inflation Rate

The study carried out further confirmatory tests on inflation rate to establish authenticity of the Jarque-Bera statistical test. The four tests employed were Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. From the four tests of normality carried out there was no evidence of normality for inflation rate. This implies that the independent variable of inflation rate is not normally distributed since the null hypothesis of normality was rejected. This was supported since the p-values were found to be less than 0.05.
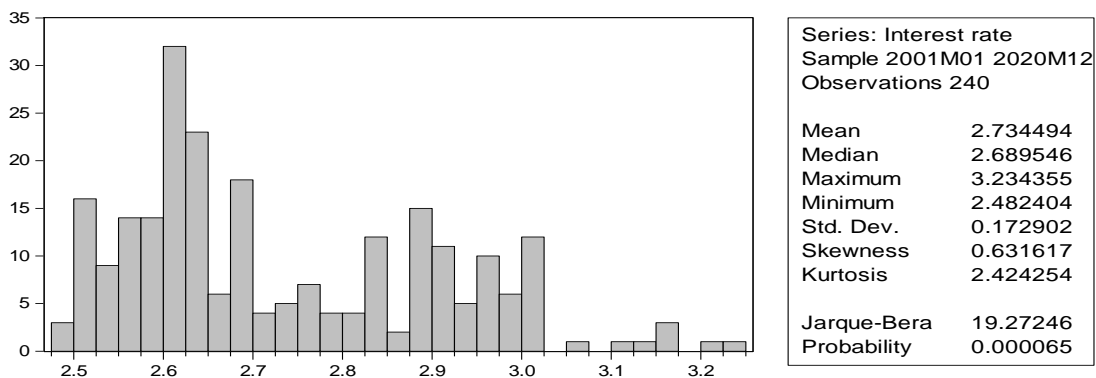
Table 4.3: Normality Test Results of Inflation Rate

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.104757	NA	0.0000
Cramer-von Mises (W2)	0.682375	0.683797	0.0000
Watson (U2)	0.678667	0.680081	0.0000
Anderson-Darling (A2)	4.688094	4.702927	0.0000

Normality Test for Interest Rate

Figure 4.23 shows the output results of normality test for the residuals. From the results, it is observed that interest rate variable is positively skewed (0.631617). This implies that from the mean value there are more data points to the upper side than the lower side. The output also reveals that the kurtosis is 2.424254 which is below the cut of value of 3.

Further, the p-value from the Jarque-Bera was 0.000065 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution can be rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary. The study agrees with the findings of Smales (2012) and also disagrees with the findings of (Wuhan & Khursid, 2015).
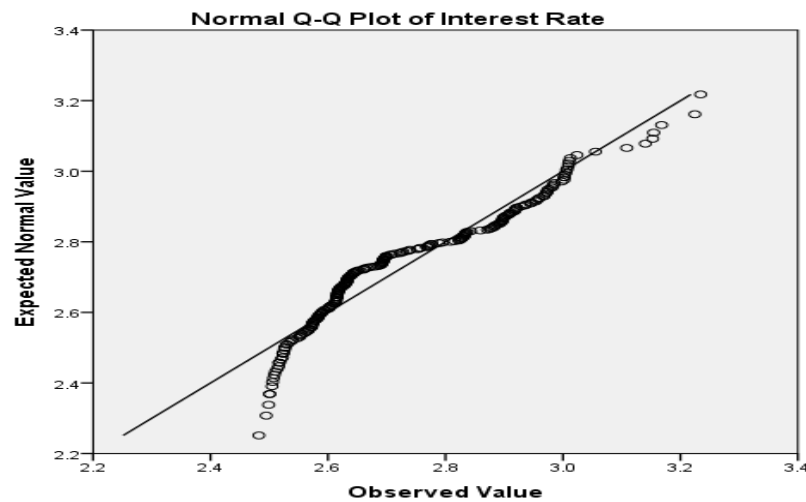

Figure 4.23: Normality Test Results of Interest Rate

Normal Q-Q plot of Interest Rate

Figure 4.24 presents the graphical illustration of the interest rate quantiles of normal. From the results it can be concluded that the majority of the observations in the middle lie along the main diagonal line except those at the end. These output shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.

Figure 4.24: Normal Q-Q Plot of Interest Rate

Other Confirmatory Normality Test for Interest Rate

The study carried out further confirmatory tests on interest rate to establish authenticity of the Jarque-Bera statistical test. The four tests employed were Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. Table 4.4 shows the four tests of normality carried out and there was no evidence of normality for interest rate variable. This implies that the independent variable of interest rate is not normally distributed since the null hypothesis of normality was rejected. This was supported since the output results of p-values from the table 4.4 were found to be less than 0.05.
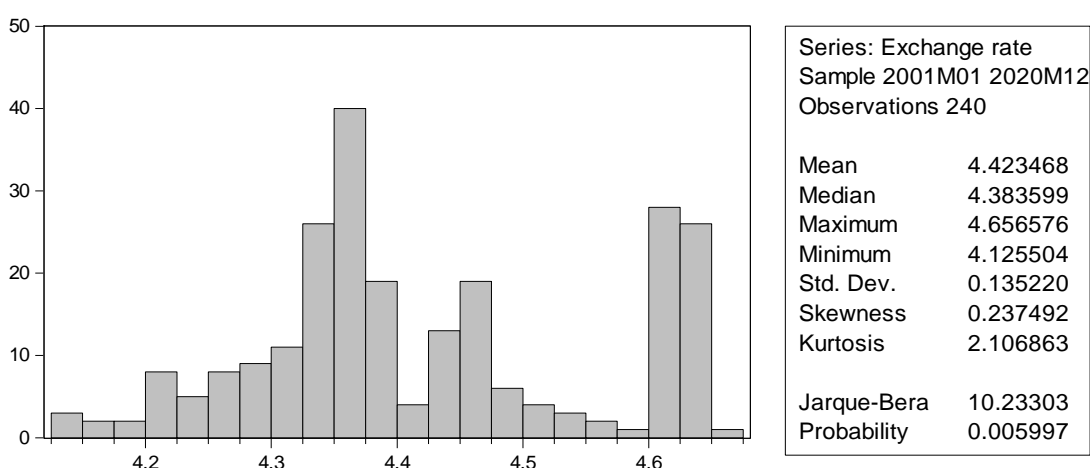
Table 4.4: Normality Test results for Interest Rate

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.153722	NA	0.0000
Cramer-von Mises (W2)	1.228362	1.230921	0.0000
Watson (U2)	1.125163	1.127507	0.0000
Anderson-Darling (A2)	6.665039	6.686127	0.0000

Normality Test for Exchange Rate

Figure 4.24 shows the output results of normality test for the residuals. From the results, it is observed that exchange rate variable is positively skewed (0.237492). This implies that from the mean value there are more data points to the upper side than the lower side. The output also reveals that the kurtosis is 2.106863 which is below the cut of value of 3.

Further, the p-value from the Jarque-Bera was 0.005997 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution can be rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary. The findings agrees with that of Bhattacharyay (2013) who did a study in Asia and the study was based on a ten year period and employed Jarque-Bera test statistics

Series: Exchange rate	
Sample 2001M01 2020M12	
Observations 240	
Mean	4.423468
Median	4.383599
Maximum	4.656576
Minimum	4.125504
Std. Dev.	0.135220
Skewness	0.237492
Kurtosis	2.106863
Jarque-Bera	10.23303
Probability	0.005997

Figure 4.25: Normality Test Results of Exchange Rate

Normal Q-Q plot of Exchange Rate

Figure 4.26 presents the graphical illustration of the exchange rate quantiles of normal. From the results above it can be concluded that the majority of the observations in the middle lie along the main diagonal line except those at the end. These output results shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.
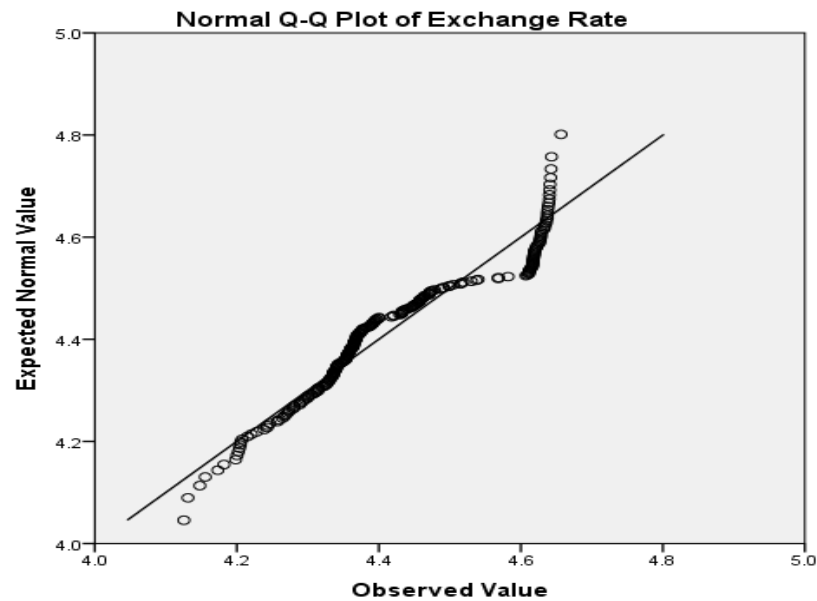
Figure 4.26: Normal Q-Q plot of Exchange Rate

Other Confirmatory Normality Test for Exchange Rate

The study carried out further confirmatory tests on exchange rate to establish authenticity of the Jarque-Bera statistical test. The four tests employed were Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. Table 4.5 shows the four tests of normality carried out and there was no evidence of normality for exchange rate variable. This implies that the independent variable of interest rate is not normally distributed since the null hypothesis of normality was rejected. This was supported since the output results of p-values from the above table 4.5 were found to be less than 0.05.

Table 4.5: Normality Test Results for Exchange Rate

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.141936	NA	0.0000
Cramer-von Mises (W2)	0.963645	0.965653	0.0000
Watson (U2)	0.927574	0.929507	0.0000
Anderson-Darling (A2)	6.318308	6.338300	0.0000

Normality Test for Gross Domestic Product

Figure 4.26 shows the output results of normality test for the residuals. From the results, it is observed that gross domestic product variable is negatively skewed (-0.203416). This implies that from the mean value there are more data points to the lower side than the upper side. The output also reveals that the kurtosis is 1.388151 which is below the cut of value of 3.

Further, the p-value from the Jarque-Bera was 0.000001 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution can be rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary. The findings agree with the findings of Koka (2012) conducted a study in Kenya between 2003 and 2011 and relied on secondary data. This implies that the study is credible.
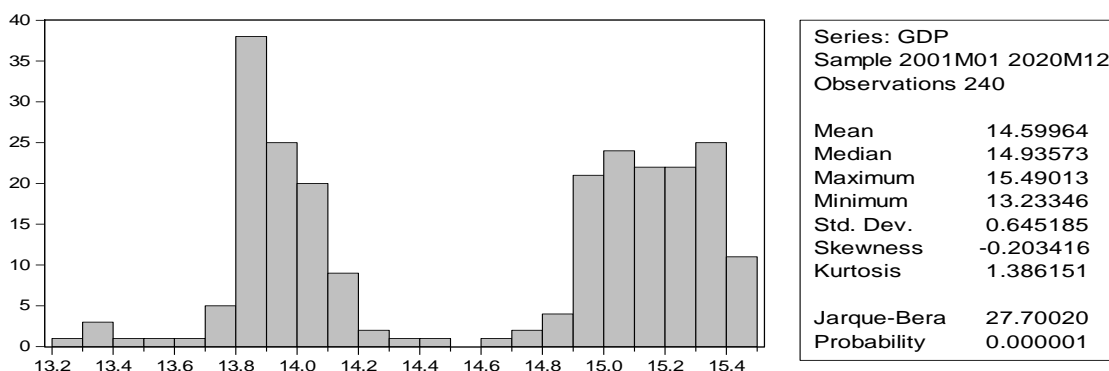
Figure 4.27: Normality Test Results of Gross Domestic Product

Normal Q-Q plot of Gross Domestic Product

Figure 4.28 presents the graphical illustration of the gross domestic product quantiles of normal. From the results above it can be concluded that the majority of the observations in the middle lie along the main diagonal line except those at the end. These output results shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.
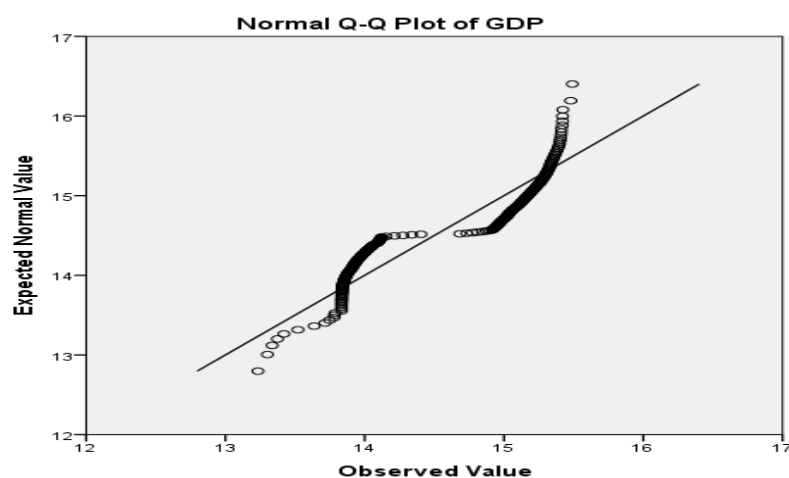
Figure 4.28: Normal Q-Q Plot of Gross Domestic Product

**Other Confirmatory Normality Test of Gross Domestic Product**

The study carried out further confirmatory tests on gross domestic product to establish authenticity of the Jarque-Bera statistical test. The four tests employed were; Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. Table 4.6 shows the four tests of normality carried out and there was no evidence of normality for gross domestic product variable. This implies that the independent variable of interest rate is not normally distributed since the null hypothesis of normality was rejected. This was supported since the output results of p-values from the above table 4.6 were found to be less than 0.05.

Table 4.6: Normality Test Results of Gross Domestic Product

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.208306	NA	0.0000
Cramer-von Mises (W2)	2.935756	2.941872	0.0000
Watson (U2)	2.918817	2.924898	0.0000
Anderson-Darling (A2)	16.26681	16.31828	0.0000

Normality Test of Diaspora Remittances

Figure 4.29 shows the output results of normality test for the residuals. From the results, it is observed that diaspora remittance variable is positively skewed (0.128065). This implies that from the mean value there are more data points to the upper side than the lower side. The output also reveals that the kurtosis is 1.733324 which is below the cut of value of 3. Further, the p-value from the Jarque-Bera was 0.000236 which is insignificant and below 0.05. This suggests that null hypothesis of normal distribution can be rejected. Rejection of the null hypothesis implies that the variable is not normally distributed and a logarithmic transformation would be necessary.
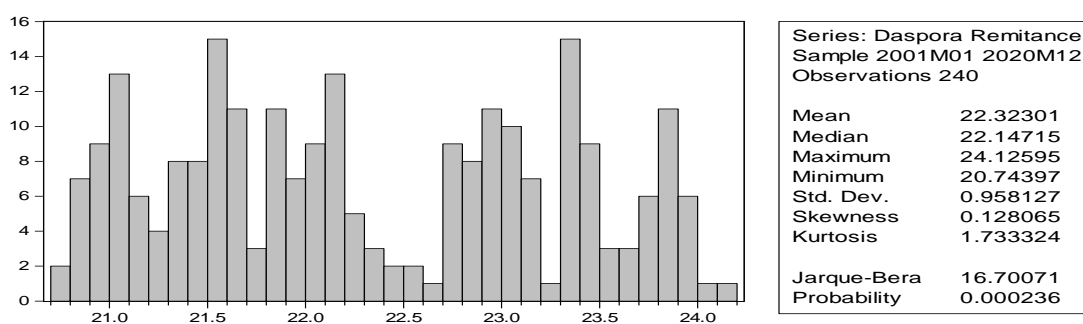

Figure 4.29: Normality Test Results of Diaspora remittances

Normal Q-Q Plot of Diaspora Remittance.

Figure 4.30 presents the graphical illustration of diaspora remittance quantiles of normal. From the results above it can be concluded that the majority of the

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observations in the middle lie along the main diagonal line except those at the end. These output results shows that the data might have come from a distribution that is approaching a normal distribution but with a few dispersions.
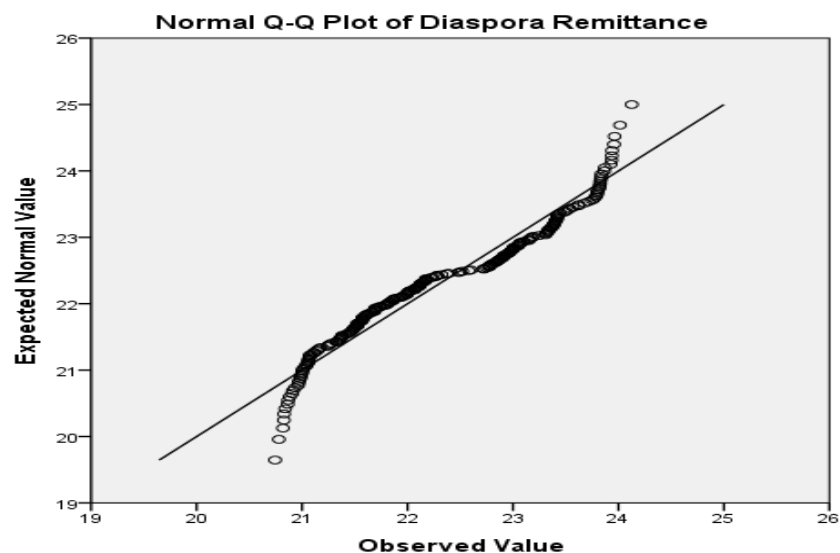
Figure 4.30: Normal Q-Q Plot of Diaspora Remittance

Other Confirmatory Normality Test for Diaspora Remittances

The study carried out further confirmatory tests on diaspora remittance to establish authenticity of the Jarque-Bera statistical test. The four tests employed were Lilliefors, Cramer-von Mises, Anderson-Darling and Watson. Table 4.7 shows the four tests of normality carried out and there was no evidence of normality for gross domestic product variable. This implies that the independent variable of diaspora remittance rate is not normally distributed since the null hypothesis of normality was rejected. This was supported since the output results of p-values from the above table 4.7 were found to be less than 0.05.

Table 4.7: Normality Test Results of Diaspora Remittances

Method	Value	Adj. Value	Probability
Lilliefors (D)	0.088256	NA	0.0001
Cramer-von Mises (W2)	0.694632	0.696079	0.0000
Watson (U2)	0.688367	0.689801	0.0000
Anderson-Darling (A2)	4.191927	4.205190	0.0000

4.4.2 Stationary Test

Stationary test is also known as unit root test. It was carried out by the study to determine the prevalence of time series data used in the study. A stationary time series data is one that exhibits near constant mean, variance and autocorrelation. If the data is non-stationary it may lead to bias outcomes. The study employed ADF statistical test to establish whether the variables were stationary or not.

The null hypothesis (H_0) states that the series is non-stationary, while the alternative hypothesis (H_1) states that the series is stationary. The null hypothesis is rejected if the p values are less than 0.05, indicating that the data set is stationary. The greater the negative value of the ADF test statistics, the stronger the rejection of the null hypothesis, implying that the data is stationary.

Stationary Test of Bond Market Growth

Table 4.8 presents the ADF results of stationary test for bond market growth variable at level. From the results, the calculated t-statistic is -2.153809 which is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value was 0.2240 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the bond market variable was non-stationary at level.

Table 4.8: Stationary Test Results of Bond Market Growth at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.153809	0.2240
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Bond Market Growth at First Difference.

Table 4.9 below presents the ADF results of stationary test for bond market growth variable at first difference. From the results, the calculated t-statistic values is -15.01559 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the bond market variable was stationary at first difference. The findings agreed with those of Mugo (2018), who conducted a study in Kenya between 2007 and 2017. The researcher used ADF statistical tests to ascertain that data is not stationary at the level, implying that the study is plausible.

Table 4.9: Stationary Test Results of Bond Market Growth at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-15.01559	0.0000
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test for Inflation Rate

Table 4.10 presents the ADF results of stationary test for inflation rate variable at level. From the results below the calculated t-statistic is -1.092563 which is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.7191 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the inflation rate variable was non-stationary at level.

Table 4.10: Stationary Test Results of Inflation Rate Unit Root at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.092563	0.7191
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Inflation Rate Variable at First Difference

Table 4.11 presents the ADF results of stationary test for inflation rate variable at first difference. From the results below the calculated t-statistic values is -9.832333 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the inflation rate variable was stationary at first difference.

Table 4.11: Stationary Test Results of Inflation Rate at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.832333	0.0000
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test for Interest Rate

Table 4.12 presents the ADF results of stationary test for interest rate variable at level. From the results below the calculated t-statistic is -2.730146 which is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.7191 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the interest rate variable was non-stationary at level. The study supports the findings of Mohd Jefri (2018), who investigated how interest rates affect Malaysia's bond market performance and found that data are not stationary at the level between 2010 and 2017.

Table 4.12: Stationary Test Results of Interest Rate at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.730146	0.0704
Test critical values:	1% level	-3.457747	
	5% level	-2.873492	
	10% level	-2.573215	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Interest Rate at First Difference

Table 4.13 below presents the ADF results of stationary test for interest rate variable at first difference. From the results below, the calculated t-statistic values is -12.84711 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the interest rate variable was stationary at first difference.

Table 4.13: Stationary Test Results of Interest Rate at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-12.84711	0.0000
Test critical values:	1% level	-3.457747	
	5% level	-2.873492	
	10% level	-2.573215	
*MacKinnon (1996) one-sided p-values.			

Stationary Test for Exchange Rate

Table 4.14 presents the ADF results of stationary test for exchange rate variable at level. From the results below the calculated t-statistic is -0.913631 which is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.7828 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the exchange rate variable was non-stationary at level.

Table 4.14: Stationary Test Results of Exchange Rate at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.913631	0.7828
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Exchange Rate at First Difference

Table 4.15 presents the ADF results of stationary test for exchange rate variable at first difference. From the results below, the calculated t-statistic values is -10.74917 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the exchange rate variable was stationary at first difference.

Table 4.15: Stationary Test Results of Exchange Rate at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.74917	0.0000
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test for Gross Domestic Product

Table 4.16 presents the ADF results of stationary test for gross domestic product variable at level. From the results below, the calculated t-statistic is -0.684860 which

is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.8471 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the gross domestic product variable was non-stationary at level. The study disagrees with the findings of Kapingura and Makhetha-Kosi (2014) who did a study in South Africa and employed the Augmented Dickey-Fuller (ADF) and Phillips-Perron models.

Table 4.16: Stationary Test Results of Gross Domestic Product at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.684860	0.8471
Test critical values:	1% level	-3.457865	
	5% level	-2.873543	
	10% level	-2.573242	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Gross Domestic Product at First Difference.

Table 4.17 presents the ADF results of stationary test for gross domestic product variable at first difference. From the results below, the calculated t-statistic value is -19.81246 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the gross domestic product variable was stationary at first difference.

Table 4.17: Stationary Test Results of Gross Domestic Product at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-19.81246	0.0000
Test critical values:	1% level	-3.457747	
	5% level	-2.873492	
	10% level	-2.573215	
*MacKinnon (1996) one-sided p-values.			

Stationary Test for Diaspora Remittance

Table 4.18 presents the ADF results of stationary test for diaspora remittance variable at level. From the results below, the calculated t-statistic is -0.153908 which is less negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value is 0.9408 which is more than the cut-off value of 0.05. However, the null hypothesis is accepted at 1%, 5% and 10% critical values. This means that the diaspora remittance variable was non-stationary at level.

Table 4.18: Stationary Test Results of Diaspora Remittances at Level

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.153908	0.9408
Test critical values:	1% level	-3.458104	
	5% level	-2.873648	
	10% level	-2.573298	
*MacKinnon (1996) one-sided p-values.			

Stationary Test of Diaspora Remittances at First Difference

Table 4.19 presents the ADF results of stationary test for diaspora remittance at first difference. From the results below, the calculated t-statistic values is -13.06458 which is more negative than the tabulated t-values at 1%, 5% and 10% significance level. The associated p-value was 0.0000 which is less than the cut-off value of 0.05. However, the null hypothesis is rejected at 1%, 5% and 10% critical values. This means that the diaspora remittance variable was stationary at first difference.

Table 4.19: Stationary Test Results of Diaspora Remittances at First Difference

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.06458	0.0000
Test critical values:	1% level	-3.458104	
	5% level	-2.873648	
	10% level	-2.573298	
*MacKinnon (1996) one-sided p-values.			

4.4.3 Autocorrelation Test

Auto correlation is the correlation between values of a variable and lagged values of that same variable. This is a situation in which a time series data is influenced by its historical values. The problem with auto correlation is that it may make a model look better than it was actually. Auto correlation would most likely lead to invalid results (Sharifzadeh, 2006).

Box-Ljung Statistics was used in this study for testing auto correlation. If p-values are more than 0.05 autocorrelation is said to be present in a variable. From the results in table 4.20 the p-values are less than 0.05 and therefore we can conclude that autocorrelation is not present hence data can be used to forecast. The study finding agrees with findings of Bhattacharyay (2013) who conducted a study on factors influencing bond market development in Asia and used time series data from 1998 to 2008.

Table 4.20: Autocorrelation Test Results

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.298	.064	21.550	1	.000
2	-.030	.064	21.763	2	.000
3	-.124	.064	25.489	3	.000
4	.037	.064	25.823	4	.000
5	-.043	.064	26.284	5	.000
6	-.011	.064	26.314	6	.000

4.4.4 Heteroscedasticity Test

The test for heteroscedasticity was aimed at establishing if the variability of the variables was not equal across a range of the predictor variables. The study used Breusch-Pagan-Godfrey statistical test method. The null hypothesis states that, there is constant variance across a range of the predictor, if the p value is more than 0.05. The output results are shown in table 4.21.

From Table 4.21 it is revealed that the overall p value obtained is greater than 0.05 and this implies that there is constant variance hence we fail to reject the null hypothesis. The probability statistics of both the F-statistic and the Chi-square probabilities of F (9,230) 0.6555 and Prob. Chi-Square (9) 0.6463 are insignificant.

The test shows that, regardless of timeline, the variance and mean of all estimations are constant, and that the model can be used to predict or forecast future movements. This shows that the model specified is optimal. The findings are consistent with those of Nkwende (2017) who did a study in Nigeria from 1982-2013 and Bhattacharyay (2013) studied factors influencing the bond market development in Asia and used panel data from 1998 to 2008.

Table 4.21: Heteroskedasticity Test Results

Breusch-Pagan-Godfrey Heteroskedasticity Test			
F-statistic	0.757840	Prob. F(9,230)	0.6555
Obs*R-squared	6.912129	Prob. Chi-Square(9)	0.6463

4.4.5 Multicollinearity Test

This study conducted Multicollinearity test among the independent variables. Multicollinearity occurs when the independent variables, in the case of this study, selected macroeconomic variables are correlated. According to Barnor (2014), If two or more independent variables are linearly dependent on each other, one of them should be included rather than both because including both raises standard errors and biases the results. Multicollinearity Test was conducted to avoid spurious regression for the time series variables. The multicollinearity test reduces the number of variables that measure the same thing and also checks for model redundancy and that is according to the study done by Robert (2007).

The Variance Inflation Factor (VIF) approach was used in this study to determine whether or not the correlation was problematic. Multicollinearity can occur when two or more variables are highly correlated, and this can affect the estimation of the regression parameters (Hair et al., 2010). The rule of thumb under this method is that if the variance inflation factor of explanatory variables is above ten, then variables are said to be collinear.

The variance inflation factor (VIF) results in Table 4.22 shows that the explanatory variables are not collinear since the VIF for all the variables are below 10 and the tolerance for all the variables was near to 1. This is evidenced that multicollinearity does not exist among all explanatory variables in the study. This is consistent with multicollinearity test findings made in similar studies in Kenya and other countries. The study findings agreed with that of Chege (2018) who employed VIF and found

that Multicollinearity does not exist between the study variables and Nkwende (2017) who did similar study in Nigeria

Table 4.22: Multicollinearity Test Results

Model		Collinearity Statistics	
		Tolerance	**VIF**
1	Inflation Rate	.987	1.013
	Interest Rate	.939	1.065
	Exchange Rate	.948	1.055
	Diaspora Remittance	.989	1.011
	Gross Domestic Product	.998	1.002
a. Dependent Variable: (Bond Growth,)			

4.4.6 Co integration Test

Time series data changes over time in that their mean and variance are not constant and this problem is addressed by performing a co integration test. The idea behind carrying out co integration test is that, although individually some of the variables are non-stationary but their linear combination could be stationary. This generally indicates that together they are bound by some relationship in the long run. As such, a co integration test was conducted to test the co integration between non-stationary time series variables namely; inflation rate, interest rate, exchange rate, gross domestic product and diaspora remittance.

The study used the Johansen-Juselius test to determine whether there was more than one co-integration relationship between macroeconomic variables, diaspora remittance and bond market growth. The choice of Johansen- Juselius test was for its convenience to use when there are more than two variables since the study had three variables namely; inflation rate, interest rate, exchange rate, gross domestic product and diaspora remittance

The rule of thumb is that, if two or more series are themselves non-stationary, but a linear combination of the time series is stationary, then the series are said to be co integrated. The Johansen- Juselius (1990) co integration test was conducted to test the order of co integrating relationships. The null hypothesis states that no co-integration exists in the data. The null hypothesis is rejected if the trace statistics is greater than the critical value.

Table 4.23 shows the Co integration test results. It can be observed when the hypothesized number of Co integration relationships is none, we reject the null hypothesis at five per cent level of significance and there exist a co-integration in the model. The trace statistics (130.1808) is greater than the critical value (95.75366) and the p value (0.0000) is significant. The trace statistics (68.57626) is less than the critical value (69.81889) and the p value (0.0625) is statistically insignificant.

This meant that the variables were related and could be combined linearly. This also implies that the variables have a long-run relationship, which may or may not hold in the short run. The studies with similar findings were; Okafor (2018) who conducted a study in Nigeria and South Africa in a period of 24 years and Ahwireng-Obeng and Ahwireng-Obeng (2019) who researched in 26 emerging economies in Africa between 2005 and 2014. Both studies employed Johansen-Juselius statistical tests.

Table 4.23: Co integration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.228055	130.1808	95.75366	0.0000
At most 1	0.161860	68.57626	69.81889	0.0625
At most 2	0.044512	26.55268	47.85613	0.8706
At most 3	0.030989	15.71578	29.79707	0.7321
At most 4	0.026667	8.223670	15.49471	0.4418
At most 5	0.007496	1.790807	3.841466	0.1808

4.4.7 Granger Causality Test

The study conducted Granger causality test as shown on table 4.24. In this study the Granger-causality test was used to investigate direction of causation between growth of bond market and macroeconomic variables. The outcome from the Granger-causality test was used to determine whether the variables under study can be used to predict each other or not. The study shows that the study variables exhibit both uni-direction as well as bidirectional behavior.

Result from table 4.24 showed a unidirectional causality between bond market growth and exchange rate. The bond market growth granger causes exchange rate with the p value of 0.0053 hence it can be used for prediction. Exchange rate does not granger cause bond market growth with the p value of 0.5590 hence it cannot be used for prediction.

Additionally, a bidirectional causal relationship was found between diaspora remittance and bond market growth with p values of 0.0081 and 0.0403. The diaspora remittance is a significant variable in predicting bond market growth as it Granger causes bond market growth hence it can be used for prediction. Conversely, result showed absence of causality between interest rate and bond market with the p values of 0.7198 and 0.8524. Interest rate does not Granger Cause bond market growth and therefore it cannot be used to forecast the bond market growth.

The study agreed with the findings of Bhattacharyay (2013), who conducted a study on bond market development in and Nyakeri (2012). The researchers revealed both unidirectional and bidirectional effects, as well as no causality in their findings.

Table 4.24: Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
CPI01 does not Granger Cause TBMG01	238	6.43198	0.0019
TBMG01 does not Granger Cause CPI01		0.66392	0.5158
CBLRATE01 does not Granger Cause TBMG01	238	0.32920	0.7198
TBMG01 does not Granger Cause CBLRATE01		0.15979	0.8524
GDP01 does not Granger Cause TBMG01	238	13.6940	2.E-06
TBMG01 does not Granger Cause GDP01		0.17568	0.8390
USD_EXCH01 does not Granger Cause TBMG01	238	0.58311	0.5590
TBMG01 does not Granger Cause USD_EXCH01		5.35810	0.0053
DIASP__REM01 does not Granger Cause TBMG01	238	4.91417	0.0081
TBMG01 does not Granger Cause DIASP__REM01		3.25581	0.0403
CBLRATE01 does not Granger Cause CPI01	238	1.00851	0.3663
CPI01 does not Granger Cause CBLRATE01		0.05251	0.9489
GDP01 does not Granger Cause CPI01	238	1.18618	0.3072
CPI01 does not Granger Cause GDP01		5.08086	0.0069
USD_EXCH01 does not Granger Cause CPI01	238	0.42848	0.6520
CPI01 does not Granger Cause USD_EXCH01		2.74782	0.0661
DIASP__REM01 does not Granger Cause CPI01	238	1.69462	0.1859
CPI01 does not Granger Cause DIASP__REM01		8.02755	0.0004
GDP01 does not Granger Cause CBLRATE01	238	0.16122	0.8512
CBLRATE01 does not Granger Cause GDP01		0.73395	0.4811
USD_EXCH01 does not Granger Cause CBLRATE01	238	2.42317	0.0909
CBLRATE01 does not Granger Cause USD_EXCH01		1.74327	0.1772
DIASP__REM01 does not Granger Cause CBLRATE01	238	0.22944	0.7952
CBLRATE01 does not Granger Cause DIASP__REM01		0.31367	0.7311
USD_EXCH01 does not Granger Cause GDP01	238	0.69307	0.5011
GDP01 does not Granger Cause USD_EXCH01		2.72445	0.0677

4.5 Autoregressive Moving Averages (ARMA)

ARMA describe the variable behavior in terms of linear relationships with their past values. An ARMA can be divided down into two parts. Autoregressive (AR)

component explains the relationship between the time series' current value and some of its previous values. The duration of the influence of a random (unexplained) shock is represented by the Moving Average (Weisang, Awazu, 2008).

ARMA Test for Bond Market Growth

Figure 4.1 showed that growth of bond market variable has exploded over time. This suggests that a time series model for growth of bond market at level may yield good results only with some modification. Statistically, series that explode over time can be problematic. Most statistical theory requires stationary (non-explosive) time series as opposed to non-stationary time series (explosive). This is an oversimplification of some rather complicated issues. However, a graph of bond market growth shows that bond market growth has exploded over time. This suggests that a time series model of the level could produce useful results.

Table 4.25 presents the results on the ARMA characteristics of the bond market growth variable. It can be observed that the variable has two terms associated with error term innovations. It also observed that the variable has one AR terms and one MA which are statistically significant as implied by the associated p-values. This implies that the current values reflect all the historical required information. The SIGMASQ (variance) is also presented and it is statistically significant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help to describe how the terms used well fit in the model. F-statistic and Durbin-Watson statistics are also presented and they also support the stability of the model.

Table 4.25: ARMA Test Results of Bond Market Growth

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016341	0.011437	1.428808	0.1544
AR(1)	0.283596	0.104423	2.715832	0.0071
MA(1)	-0.738227	0.068471	-10.78160	0.0000
SIGMASQ	0.225528	0.019118	11.79685	0.0000
R-squared	0.181609	Mean dependent var		0.013235
Adjusted R-squared	0.171162	S.D. dependent var		0.526054
S.E. of regression	0.478922	Akaike info criterion		1.383718
Sum squared resid	53.90117	Schwarz criterion		1.441902
Log likelihood	-161.3543	Hannan-Quinn criter.		1.407164
F-statistic	17.38295	Durbin-Watson stat		2.006642
Prob(F-statistic)	0.000000			

ARMA Test for Inflation Rate

From figure 4.4 of inflation rate, it is revealed that the variable has exploded over time. This suggests that a time series model of the level may yield good results after some keen modification. Instead of modeling the level directly, a common solution is to build a model of the variable's first difference. Given such a differentiated model, we must then integrate the first differences in order to recover the levels. So an ARMA model of the first difference is an AR-Integrated-MA, or ARIMA, model of the level.

Table 4.26 presents the results on the ARMA characteristics of the Inflation Rate variable. It can be observed that the variable has two AR terms. The two AR used are statistically insignificant as implied by the associated p-values. The conclusion is that the variable is purely an AR process. This implies that the current values reflect all the historical required information.

The SIGMASQ (variance) is also presented and it is statistically insignificant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help

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to describe how the terms used well fit in the model. F-statistic and Durbin-Watson stat are also presented and they also support the stability of the model.

Table 4.26: ARMA Test Results of Inflation Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006151	0.000979	6.283197	0.0000
AR (1)	0.493427	0.054691	9.022057	0.0000
AR (2)	-0.170414	0.047856	-3.560992	0.0004
SIGMASQ	8.05E-05	4.67E-06	17.25171	0.0000
R-squared	0.202141	Mean dependent var		0.006160
Adjusted R-squared	0.191956	S.D. dependent var		0.010069
S.E. of regression	0.009051	Akaike info criterion		-6.554238
Sum squared resid	0.019251	Schwarz criterion		-6.496055
Log likelihood	787.2315	Hannan-Quinn criter.		-6.530792
F-statistic	19.84613	Durbin-Watson stat		2.008612
Prob(F-statistic)	0.000000			

ARMA Test for Interest Rate

Figure 4.7 of interest rates shows that the rate has exploded over time. This implies that a time series model for rate at level may produce good results with some modification. Instead of modeling the level directly, a common solution to this problem is to build a model of the variable's first difference. Given such a differentiated model, we must then integrate the first differences in order to recover the levels.

Table 4.27 above presents the results on the ARMA characteristics of the interest rate variable. It can be observed that the variable has three terms associated with error term innovations. It was also observed that the variable has two AR terms and one MA and is statistically significant as implied by the associated p-values. The conclusion is that there is an ARMA process for this variable with one MA after

differencing. This implies that the current values reflect all the historical required information after introduction of some lags.

The SIGMASQ (variance) is also presented and it is statistically significant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help to describe how the terms used well fit in the model. The F-statistic and Durbin-Watson statistic are also presented and they also support the stability of the model.

Table 4.27: ARMA Test Results for Interest Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.767113	0.123043	22.48894	0.0000
AR (1)	1.777361	0.183316	9.695594	0.0000
AR (2)	-0.783072	0.180994	-4.326504	0.0000
MA (1)	-0.631006	0.220176	-2.865913	0.0045
SIGMASQ	0.000835	2.42E-05	34.43121	0.0000
R-squared	0.971959	Mean dependent var		2.734494
Adjusted R-squared	0.971482	S.D. dependent var		0.172902
S.E. of regression	0.029199	Akaike info criterion		-4.191528
Sum squared resid	0.200351	Schwarz criterion		-4.119014
Log likelihood	507.9833	Hannan-Quinn criter.		-4.162310
F-statistic	2036.408	Durbin-Watson stat		1.993770
Prob (F-statistic)	0.000000			

ARMA Test for Exchange Rate

Figure 4.10 of exchange rate, revealed that it has exploded over time. This suggests that a time series model of the level may yield good results. A standard solution to this problem is to build a model of the first difference of the variable instead of modeling the level directly.

Table 4.28 presents the results on the ARMA characteristics of the Exchange Rate variable. It can be observed that the variable has three terms associated with error term innovations. It also observed that the variable has zero AR terms. The one MA used is statistically insignificant as implied by the associated p-values. The conclusion is that the variable is purely an MA process for this variable. This implies that the current values reflect all the historical required information.

The SIGMASQ (variance) is also presented and it is statistically insignificant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help to describe how the terms used well fit in the model. F-statistic and Durbin-Watson stat are also presented and they also support the stability of the model.

Table 4.28: ARMA Test Results for Exchange Rate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001546	0.001576	0.980810	0.3277
MA(1)	0.416636	0.035280	11.80927	0.0000
SIGMASQ	0.000285	1.14E-05	25.12025	0.0000
R-squared	0.128610	Mean dependent var		0.001510
Adjusted R-squared	0.121225	S.D. dependent var		0.018130
S.E. of regression	0.016995	Akaike info criterion		-5.298473
Sum squared resid	0.068167	Schwarz criterion		-5.254836
Log likelihood	636.1676	Hannan-Quinn criter.		-5.280889
F-statistic	17.41576	Durbin-Watson stat		2.052324
Prob(F-statistic)	0.000000			

ARMA test for Gross Domestic Product

From 4.13 shows that gross domestic product trend graph has exploded over time. This suggests that a time series model for gross domestic product, at level may yield good results only with some modification.

Table 4.29 presents the results on the ARMA characteristics of the gross domestic product variable. It can be observed that the variable has three terms associated with error term innovations. It was also observed that the variable has four AR terms and only two were statistically significant as implied by the associated p-values. The conclusion is that there is a pure AR process for this variable with no MA.

This implies that the current values reflect all the historical required information after introduction of a single lag for AR term. The SIGMASQ (variance) is also presented and it is statistically significant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help to describe how the terms used well fit in the model. F-statistic and Durbin-Watson stat are also presented and they also support the stability of the model.

Table 4.29: ARMA Test Results for Gross Domestic Product

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007120	0.003883	1.833516	0.0680
AR(1)	-0.180741	0.023929	-7.553089	0.0000
AR(2)	0.263726	0.017647	14.94456	0.0000
SIGMASQ	0.002666	6.14E-05	43.43851	0.0000
R-squared	0.127084	Mean dependent var		0.007120
Adjusted R-squared	0.115941	S.D. dependent var		0.055385
S.E. of regression	0.052075	Akaike info criterion		-3.054788
Sum squared resid	0.637285	Schwarz criterion		-2.996605
Log likelihood	369.0472	Hannan-Quinn criter.		-3.031342
F-statistic	11.40424	Durbin-Watson stat		2.045564
Prob(F-statistic)	0.000001			

ARMA Test for Diaspora Remittances

From figure 4.16 of Diaspora Remittances, it's found that Diaspora Remittances has exploded over time. This suggests that a time series model for Diaspora Remittances,

at level may yield good results after careful modification. Table 4.30 presents the results on the ARMA characteristics of the Diaspora Remittances variable. It can be observed that the variable has three terms associated with error term innovations. It also observed that the variable has two AR terms. The three MA used were also statistically significant as implied by the associated p-values. The conclusion is that there is both an AR and MA process for this variable. This implies that the current values reflect all the historical required information after introduction of some lags.

The SIGMASQ (variance) is also presented and it is statistically significant. The bottom most part also presents the usual R-squared and Adjusted R-squared that help to describe how the terms used well fit in the model. F-statistic and Durbin-Watson stat are also presented and they also support the stability of the model.

Table 4.30: ARMA Test Results for Diaspora Remittances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012997	0.002473	5.255967	0.0000
AR(1)	1.152441	0.060104	19.17423	0.0000
AR(2)	-0.890661	0.058835	-15.13824	0.0000
MA(1)	-1.647985	0.093422	-17.64018	0.0000
MA(2)	1.344310	0.142229	9.451737	0.0000
MA(3)	-0.384559	0.078996	-4.868092	0.0000
SIGMASQ	0.007845	0.000644	12.17738	0.0000
R-squared	0.247760	Mean dependent var		0.013445
Adjusted R-squared	0.228306	S.D. dependent var		0.102333
S.E. of regression	0.089896	Akaike info criterion		-1.947870
Sum squared resid	1.874851	Schwarz criterion		-1.846049
Log likelihood	239.7705	Hannan-Quinn criter.		-1.906839
F-statistic	12.73539	Durbin-Watson stat		2.024069
Prob(F-statistic)	0.000000			

4.6 Correlation Analysis for Linear Relationship between study Variables

The study conducted a correlation matrix to establish the relationship that exists between the study variables. The study conducted a correlation analysis to determine the strength of the relationship between the study variables. Pearson Correlation was used for correlation with (r) used as a correlation coefficient that determines the relationship. This section assessed the relationship between the study variables that includes the following; Inflation rate, exchange rate, interest rate, GDP, diaspora remittance and bond market growth.

The correlation coefficient gives a statistical that ranges between -1 to 1. At zero (0) values it means that there is no correlation between two variables. At the value of one (1) there is a strong positive correlation and at value of (-1) there is a strong negative correlation. The more the value approaches 1 the stronger it becomes and the opposite is true. This implies that a positive coefficient indicates a positive correlation between the variables, whereas a negative coefficient indicates a negative correlation. If the coefficient is zero, there is no correlation between the two factors (Mugenda et al., (2012).

In some cases, however, correlation does not always imply causation. Two variables can be correlated, but one does not always cause the other to behave in a certain way. According to Idrees. Alam and Agarwal. (2019). an empirical finding of an association does not imply that changes in one variable are causing changes in the other, no matter how strong the correlation. Non-stationary time series, whether causally related or not, are frequently correlated,

Table 4.37 shows the results of correlation coefficient computed for each pair of variables. The level of significance for the correlation between variables was 5%, with either positive or negative correlation.

Table 4.31: Correlation Matrix Results

P-Value	Growth of bond market	Inflation rate	Interest rate	Economic growth	Exchange rate	Diaspora remittance
Growth of bond market	1.00					

Inflation rate	0.638	1.00				
P-value	0.000	-----				
Interest rate	-0.080	-0.186	1.00			
P-value	0.062	0.000	-----			
Economic growth	0.630	0.427	-0.201	1.00		
	0.000	0.000	0.000	-----		
Exchange rate	0.414	0.567	-0.030	0.570	1.00	
p-value	0.000	0.000	0.476	0.000	-----	
Diaspora remittance	0.633	0.629	-0.200	0.524	0.565	1.00
p-value	0.000	0.000	0.000	0.000	0.000	-----

From the findings in table 4.31, it shows a summary on the correlation analysis between bond market growth, various independent variable and the moderating variable. The findings showed that the bond market growth had a high correlation with inflation rate (r =0.638), p – value < 0.005). This implies that a positive change of inflation rate results to better growth rate of bond markets in Kenya with a significant influence.

The correlation between interest rate and the growth of bond market negative and insignificant (r= -0.080, p-value 0.062). This implies that interest rate has no association with the growth of bond market. Results similarly revealed that the relationship between exchange rate and interest rate is not significant (r = -0.030, P – value 0.476). This

indicates that a change in exchange rate has no direct relationship with interest rate. The findings also revealed that there was a positive correlation between exchange rate and GDP (r= 0.567, p-value 0.000) that implies that an increase in exchange rate leads to an increase in GDP.

Table 4.31 also revealed that diaspora remittance a negative significant influence to interest rates (r= -0.0200, p-value 0.000). This implies that an increase in diaspora remittance leads to fall of the interest rates. However, the association between diaspora remittance and the growth of bond markets (r= 0.633, p-value 0.000), diaspora remittance and GDP (r= 0.524, p-value 0.00), diaspora and exchange rate (r= 0.0565, p-value 0.000) all has positive significant influence.

The findings disagree with those of Ngabirano (2016), who revealed that exchange rates had a negative correlation with bond performance, and also disagree with those of Nyakeri (2012), who found that commercial bank lending rates have a positive association with bond yield. Further, the study supports the findings of Mugo (2018), who found that interest rates have a negative relationship with bond performance, and those of Nyakeri (2012), who found that inflation has a positive correlation with bond yield.

4.7 Regression Analysis

The study used time series regression analysis to determine linear relationship between the independent variables moderating variable and dependent variable of the study. The null hypothesis tested used time series linear regression models. F statistics was used to test the validity of the model while the R^2 was used to measure the model's goodness of fit. The regression coefficient was used to describe the results of the regression analysis and outline the nature of the association between the study variables. The following time series model was fitted to guide the analysis;

Model 1 (without moderator interaction)

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

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Table 4.32 presents the results on the fitness statistics. From the results it can be observed that the combined independent variables R^2 was 0.84 meaning that they jointly explained 84% variation in effective bond market growth and the P values was 0.0000 hence significant. However, 16 % in of bond market growth cannot be explained by independent variables. The R value of .916 indicated a strong positive correlation between macroeconomic variables and the growth of bond markets. The results also show that the R- square change and F-change are statistically significant in the model. This finding confirms results made in other studies like; Githinji (2011); Mugo (2012); Munguci (2019); Balozi (2017); Bhattacharyay (2013, which found that a strong positive correlation between macroeconomic variables and bond market development and a higher percentage coefficient of correlation.

4.7.1 Effect of Inflation Rate on Growth of Bond Market

The first objective sought to determine the relationship between the inflation rate and bond market growth. The null hypothesis states that; there is no relationship between inflation rate and bond market growth. In establishing the influence of inflation rate (X_{1t}) on bond market growth (Y_t), the time series regression analysis was adopted to test the hypothesis. The hypothesis to be tested was **H_{01}**: Inflation rate has no significant influence on bond market growth in Kenya.

The coefficients result in table 4.33 shows that influence of inflation rate on the growth of bond market was positively and significantly correlated (β_1 =0.300448, t = 11.25331, p-value = 0.000). The study findings revealed that the inflation rate had a statistically positive significant influence on the growth of bond market. The null hypothesis is therefore rejected that inflation rate (X_{1t}) has significant influence on bond market growth (Y_t). This implies that 1 unit change in inflation rate causes 0.300448-unit changes in bond market growth.

4.7.2 Effect of Interest Rate on Growth of Bond Market

The Second objective sought to establish the relationship between the interest rate and bond market growth. The null hypothesis states that: there is no relationship between interest rate and bond market growth. In establishing the influence of

interest rate (X_{2t}) on bond market growth (Y_t), the time series regression analysis was adopted to test the hypotheses and the findings of the study are shown in tables below. The hypothesis to be tested was **H$_{02}$**: Interest rate has no significant influence on bond market growth in Kenya

Regression of coefficients results in table 4.33 shows that interest rate was positively correlated with the growth Bond market (β_1 = 0.321063, t = 9.147167, p-value = 0.0000). The study findings revealed that the interest rate had a significant positive influence on the growth of bond market. The null hypothesis therefore was rejected that interest rate (X_{2t}) has no significant influence on bond market growth (Y_t). It is concluded that 1 unit change in interest rate causes 0.321063-unit changes in the growth of bond market. This implies that the inflation rate and bond market growth move in the same direction.

4.7.3 Effect of Exchange Rate on Growth of Bond Market

The third objective sought to establish the relationship between the exchange rate and bond market growth. The null hypothesis states that: There is no relationship between exchange rate and bond market growth in establishing the influence of exchange rate (X_{3t}) on bond market growth (Y_t), the time series regression analysis was adopted to test the hypothesis and the findings of the study are shown in tables below. The hypothesis to be tested was **H$_{03}$**: Exchange rate has no significant influence on bond market growth in Kenya

Regression coefficients in table 4.33 above show the regression coefficient of exchange rate on Bond market growth was positively related (β_1= 2.180199, t = 104.3332, p-value = 0.000), The study findings reveal that the exchange rate had a positive significant influence on the growth of bond market. The null hypothesis is therefore rejected that exchange rate (X_{3t}) has no significant influence on bond market growth (Yt). This implies that 1 unit change in exchange rate causes 2.180199-unit changes in bond market growth. This implies that the exchange rate and bond market growth move in the same direction.

4.7.4 Effect of Gross Domestic Product on Growth of Bond Market

The fourth objective sought to evaluate the relationship between the gross domestic product and bond market growth. The Null hypothesis states that: There is no relationship between gross domestic product and bond market growth. In establishing the influence of gross domestic product (X_{4t}) on bond market growth (Y_t), the time series regression analysis was adopted to test the hypothesis and the findings of the study are shown in tables below. The hypothesis to be tested was **H$_{04}$**: Gross domestic product has no significant influence on bond market growth in Kenya

Regression coefficients in table 4.33 above show the regression coefficient of gross domestic product on Bond market growth was positively related (β_1= 2.468579, t = 33.75503, p-value = 0.000), The study findings reveal that gross domestic product had a positive significant influence on the growth of bond market. The null hypothesis is therefore rejected that gross domestic product (X_{4t}) has no significant influence on bond market growth (Yt). It is concluded that 1 unit change in gross domestic product causes 2.468579-unit changes in bond market growth.

Table 4.32: Model Summary Results for Model 1

R	R Square	Adjusted R Square	R Square Change	F Change	df1	df2	Sig. F Change
				Change Statistics			
0.916	0.840	.837	.840	307.462	4	235	0.000

a. Predictors: (Constant), Inflation Rate, Interest Rate, Exchange Rate, GDP

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Table 4.33: Coefficients Results of Model 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.067508	3.675825	-2.19475	0.0016
X_{1t}	0.300448	0.026699	11.25331	0.0000
X_{2t}	0.321063	0.035100	9.147167	0.0000
X_{3t}	2.180199	0.020897	104.3332	0.0000
X_{4t}	2.468579	0.073132	33.75503	0.0000

a. Dependent Variable: Bond Market Growth

X_{1t} = Inflation Rate, X_{2t} = Interest Rate, X_{3t} = Exchange Rate, X_{4t} = GDP

Analysis of Variance

From the ANOVA analysis results in table 4.34 below, independent variables significantly influence the bond market growth because the p value is equal to 0.000 and less that the significance level of 0.05 used in the study. A time series regression model was fitted to the data and it was found to be statistically significant (F= 307.462, p-value < 0.05). The regression analysis results in the ANOVA table shows that the overall regression model significantly predicts the growth of bond market at 95% significance level. This implies that statistically, the applied model can predict the changes the growth of bond market. The findings of the study agree with those of Kamenju (2018), who also used the analysis of variance and found F statistic and p value was significance hence the model was predictable.

Table 4.34: Analysis of Variance Results of Model 1

	Sum of Squares	df	Mean Square	F	Sig.
Regression	442.646	4	110.662	307.462	0.000
Residual	84.581	235	.360		
Total	527.228	239			

a. Dependent Variable: Bond Market Growth

b. Predictors: (Constant), Inflation Rate, Interest Rate, Exchange Rate, GDP

Model Fitting

The regression model was fitted as shown below;

Model 1 (without diaspora remittance interaction)

$$Y_t = -8.067508 + 0.300448X_{1t} + 0.321063X_{2t} + 2.180199X_{3t} + 2.468579X_{4t} + \varepsilon_t$$

Inflation Rate

Regression of coefficients results in table 4.33 shows that inflation rate on Bond market growth was positively and significantly correlated ($r=0.300448X_{1t}$, $p=0.0000$). The study findings revealed that the inflation rate had a statistically positive significant influence on the growth of bond market. The null hypothesis therefore rejected and conclude that inflation rate (X_{1t}) has significant influence on bond market growth (X_{1t}). It is concluded that 1 unit change in inflation rate causes 0.300448-unit changes in bond market growth.

Findings in this study are comparable to findings made by other studies in Kenya. Ganatra (2016) conducted research on factors influencing performance of Kenyan infrastructure bonds using multiple regression model and found there was a positive link between inflation and infrastructure bonds. Balozi (2017) investigated the factors that influence Kenyan government bond yields, using VAR model a positive influence on government bond yields. Ngaruiya and Njuguna (2016) studied the impact of inflation on bond prices in Kenya, using multiple regression model the study found a negative relationship between inflation and bond prices.

Interest Rate

Regression of coefficients results in table 4.33 shows that interest rate was positively correlated with the growth Bond market ($r=0.321063X_{2t}$, $p=0.0000$). The study findings revealed that the interest rate had a significant positive influence on the growth of bond market. The null hypothesis therefore rejected and conclude that interest rate (X_{2t}) has significant influence on bond market growth (Y_t). It is

concluded that 1 unit change in interest rate causes 0.321063 unit changes in the growth of bond market.

The studies with similar findings were Ndunda (2018), who investigated the effects of interest rates and bond yields in Kenya, and Balozi (2017), who investigated the factors that influence Kenyan government bond yields. Njoroge (2013) did a study on the association between interest rates and the financial performance of listed companies on the Nairobi Securities Exchange. However, Ochieng (2016), who looked at the effects of interest rates on bond values in the NSE, found a negative influence, and the study used the central bank rate as a measure of interest rates.

Exchange Rate

The results in table 4.33 show the regression coefficient of exchange rate on Bond market growth was positively related (r=2.180199X_{3t}, p=0.0000). The study findings reveal that the exchange rate had a positive significant influence on the growth of bond market. The null hypothesis therefore rejected that exchange rate (X_{3t}) has no significant influence on bond market growth (Y_t). It is concluded that 1 unit change in exchange rate causes 3.21063-unit changes in bond market growth.

This result corroborates the findings of Francová (2017), who investigated the relationship between bond valuation and exchange rate. Using panel data analysis, the study found a positive significance impact between exchange rate and bond valuation. The study also disagrees with that of Lusarczyk, Meyer, and Neethling (2020), who studied the relationship between government bond yields and exchange rates in South Africa. The researcher discovered a significant positive relationship between the exchange rate and the yield on bonds. The study also disagrees with those of Ochieng (2016), who investigated currency fluctuation and NSE performance, and this may result from methodologies employed in data analysis. Furthermore, the findings are consistent with those of Gadanecz, Miyajima, and Shu (2014), who investigated the relationship between exchange rate bond yields on emerging markets and found a positive significant influence.

Gross Domestic Product

The results in table 4.33 show the regression coefficient of gross domestic product on Bond market growth was positively related (r= 2.468579X_{4t}, p=0.0000). The study findings reveal that the gross domestic product had a positive significant influence on the growth of bond market. The null hypothesis is therefore rejected that gross domestic product (X_{4t}) has no significant influence on bond market growth (Y_t). It is concluded that 1 unit change in gross domestic product causes 2.468579 unit changes in bond market growth.

This result corroborates the findings of Fink, Hasiss, and Hristoforova (2013), who studied the relationship between aggregate bond market development and real GDP in the UK. A VAR model was used, which found a positive significance influence between bond market development and real GDP. The study also disagrees with that of Nyakeri (2012), who looked at the relationship between certain macroeconomic variables and bond yields on the Nairobi Securities Exchange and found that GDP has no significant impact on bond performance. Further, the study conducted by Musah (2019) on bond market determinants and the development of the Ghanaian bond market found that GDP is the most important determinant affecting the bond market by using VECM model in data analysis.

4.7.5 Moderating Effect of Diaspora Remittances on the Relationship Between Macroeconomic Variables and Growth of Bond Market

A moderator (Z_t) is a third variable in a study that influences the strength or relationship between an independent variable (X_t) and dependent variable (Y_t). Moderation occurs when the effect of an independent variable on a dependent variable varies according to the level of a third variable termed as a moderator variable, which interacts with the independent variable. Moderating effect occurs when a third variable or construct changes the relationship between independent and dependent variable (Edwards & Lambert, 2007).

The study sought to establish the moderating effect of diaspora remittance on the relationship between macroeconomic variables and growth of bond market in Kenya.

The study used time series regression analysis to test the influence of the diaspora remittances on the relationship between macroeconomic variables and growth of bond markets. For testing moderating influence, the study variables were analyzed jointly with the moderating variable as an interaction term.

The macroeconomic variables that influence the growth of the bond markets used in the study were; the inflation rate, interest rate, exchange rate, and GDP. In this section, the study conducted regression analysis to confirm if diaspora remittances had a moderating effect on the relationship between macroeconomic variables and growth of bond markets. Further, the hypothesis to be tested was; H_{05}: Diaspora remittance has no significant influence on the relationship between macroeconomic variables and growth of bond markets in Kenya

Table 4.35 presents results summary of regression model generated from moderating effect of macroeconomic variables. From the results in table 4.35, R^2 equal to 0.851 indicates that only 85.1% of the variation in bond market growth can be explained by moderated macroeconomic variables. 14.9% variations of bond market growth cannot be explained by moderated macroeconomic variables. The p value equal to 0.000 indicates that moderated macroeconomic variables significantly influence the bond market growth. Consequently, the F-change is statistically significant. This show that there is a significant moderation effect of macroeconomic variables on the influence of macroeconomic variables on growth of bond markets in Kenya.

Moderating Effect of Diaspora Remittance on the Relationship between Inflation Rate and Growth of Bond Market.

Regression coefficients in table 4.36 above show the regression coefficient of moderated inflation rate ($X_{1t} * Z_{1t}$) on the growth of bond market was positively related (β=-21.99289, t=-5.112772, P-value=0.0000). The study findings reveal that inflation rate had a positive significant influence on the growth of bond market. This implied that inflation rate contributed an index of 21.99289 to effectiveness of the growth in the bond market. It is concluded that 1 unit change in inflation rate causes 21.99289 unit changes in bond market growth (Y_t).

Moderating Effects of Diaspora Remittance on the Relationship between Interest Rate and Growth of Bond Market.

Regression coefficients in table 4.36 above show the regression coefficient of moderated interest rate ($X_{2t} * Z_{1t}$) on the growth of bond market was positively related ($\beta=6.506514$, $t=2.403460$, P-value=0.0162). The study findings reveal that interest rate had a positive significant influence on the growth of bond market. This implied that interest rate contributed an index of 6.506514 to effectiveness of the growth in the bond market. It is concluded that 1 unit change in interest rate causes 6.506514 unit changes in bond market growth (Yt).

Moderating Effects of Diaspora Remittance on the Relationship between Exchange Rate and Growth of Bond Market.

Regression coefficients in table 4.36 above show the regression coefficient of moderated exchange rate ($X_{3t} * Z_{1t}$) on the growth of bond market was positively related ($\beta=44.45904$, $t=22.19006$, P-value=0.0000). The study findings reveal that exchange rate had a positive significant influence on the growth of bond market. This implied that exchange rate contributed an index of 44.45904 to effectiveness of the growth in the bond market. It is concluded that 1 unit change in gross domestic product causes 44.45904 unit changes in bond market growth (Yt).

Moderating Effects of Diaspora Remittance on the Relationship between GDP and Growth of Bond Market.

Regression coefficients in table 4.36 above show the regression coefficient of moderated gross domestic product ($X_{4t} * Z_{1t}$) on the growth of bond market was positively related ($\beta=16.40064X_{4t}$, $t=54.90832$, P-value=0.0000). The study findings reveal that moderated gross domestic product had a positive significant influence on the growth of bond market. This implied that GDP contributed an index of 16.40064 to effectiveness of the growth in the bond market. It is concluded that 1 unit change in gross domestic product causes 16.40064 unit changes in bond market growth (Yt).

Table 4.35: Model Summary Results for Moderated Variables

R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
0.923	0.851	0.848	0.5797	0.004	7.211	0.008

a. Predictors: (Constant), X_{1t}, X_{2t}, X_{3t}, X_{4t}, Diaspora Remittance, X_{1t} *Diaspora Remittance, X_{2t}* Diaspora Remittance, X_{3t}* Diaspora Remittance, X_{4t}* Diaspora Remittance

Table 4.36: Coefficient Results for Moderated Variables

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-84.19787	16.98758	-4.956437	0.0000
X1t	21.99289	4.301559	5.112772	0.0000
X2t	6.506514	2.707145	2.403460	0.0162
X3t	44.45904	2.003556	22.19006	0.0000
X4t	16.40064	0.298691	54.90832	0.0000
Z_{1t}	4.282418	0.768254	5.574223	0.0000
X1t * Z_{1t}	1.118852	0.187518	5.966635	0.0000
X2t * Z_{1t}	0.321488	0.122821	2.617536	0.0089
X3t * Z_{1t}	2.092498	0.104611	20.00270	0.0000
X4t * Z_{1t}	0.849940	0.012128	70.07859	0.0000

a. Dependent Variable: Bond Market Growth

X_{1t} = Inflation Rate, X_{2t} = Interest Rate, X3t = Exchange Rate, X4t = GDP, Z_{1t} = Diaspora Remittance, Xt * Z_{1t} = Interaction term

4.8 Analysis of variance (ANOVA) for Moderated Variables

Table 4.37 indicates the output results of ANOVA. The F calculated value is 146.270 in the model but the F critical using 5% level of significance is 2.76. Since the F Calculated-Value is higher that F-critical it implies that the model of the study was statistically significant thus the moderated macroeconomic variables had an effect on bond market growth. Further from the results it can be observed that these statistics were significant since the p-values are less than 0.05.

This is an indication that macroeconomic variable and diaspora remittance have significantly influence on bond market growth in Kenya. This is further reinforced by the significant moderation effect of diaspora remittance on the relationship between macroeconomic and the bond market growth in Kenya since after moderation the p-value is 0.000. For this model the results disclose that the macroeconomic variables employed are relevant in the explaining the bond market growth. The study agrees with that of Musah (2019), who conducted a study on bond market determinants and the development of the bond market in Ghana and, using an ANOVA table, found that the F statistics and p value were significant.

Table 4.37: Analysis of variance (Anova) Results for Moderated Variables

Model		Sum of Squares	df	Mean Square	F	p-value
1	Regression	448.901	9	49.878	146.270	0.000
	Residual	78.326	230	0.341		
	Total	527.227	239			

a. Dependent Variable, Bond Market Growth

b. Predictors: (Constant), X_{1t}, X_{2t}, X_{3t}, X_{4t}, Diaspora Remittance, X_{1t} *Diaspora Remittance, X_{2t}* Diaspora Remittance, X_{3t}* Diaspora Remittance, X_{4t}* Diaspora Remittance

Table 4.38: Coefficient Results for Moderated Variables

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-84.19787	16.98758	-4.956437	0.0000
X_{1t}	21.99289	4.301559	5.112772	0.0000
X_{2t}	6.506514	2.707145	2.403460	0.0162
X_{3t}	44.45904	2.003556	22.19006	0.0000
X_{4t}	16.40064	0.298691	54.90832	0.0000
Z_{1t}	4.282418	0.768254	5.574223	0.0000
$X_{1t} * Z_{1t}$	1.118852	0.187518	5.966635	0.0000
$X_{2t} * Z_{1t}$	0.321488	0.122821	2.617536	0.0089
$X_{3t} * Z_{1t}$	2.092498	0.104611	20.00270	0.0000
$X_{4t} * Z_{1t}$	0.849940	0.012128	70.07859	0.0000

a. Dependent Variable: Bond Market Growth

X_{1t} = Inflation Rate, X_{2t} = Interest Rate, X_{3t} = Exchange Rate, X_{4t} = GDP, Z_{1t} = Diaspora Remittance, $X_{1t} * Z_{1t}$ = Interaction term

4.9 Optimal Model Fitting

The coefficients was fitted in the model in the model 2 equation as shown below;

Model 2 (with diaspora remittance interaction)

Y_t = -84.19787 + 21.99289 X_{1t} +   6.506514 X_{2t} + 44.45904 X_{3t} +16.40064 X_{4t} + 4.282418 Z_t + 1.118852 X_{1t} + 0.321488 X_{2t} + 2.092498 X_{3t} + 0.849940X_{4t} + ε_t

4.9.1 Discussion of joint Overall Model

After data collection, the secondary data was tabulated, edited, processed and analyzed. The following were the answers to the research questions. The answers were summarized from on each variable.

Inflation Rate

The results in table 4.38 shows the regression coefficients of regression model where diaspora remittance is used as a moderator variable. Regression of coefficients results in table 4.38 shows that inflation rate and Bond market growth were positively and significantly related (r=0.300448X_{1t}, p=0.0000). The study findings revealed that the inflation rate had a strong influence on the growth of bond market with significant. Before moderation a positive coefficient of inflation rate was 0.300448 implying that the inflation rate and bond market growth move in the same direction. It is concluded that 1 unit change in inflation rate causes 0.300448 unit changes in bond market growth.

After moderation a positive coefficient of inflation rate was 21.99289 implying that the moderated inflation rate and bond market growth move in the same direction. It is concluded after introducing a moderating effect of diaspora remittance, 1 unit change in moderated interest rate causes 21.99289 unit changes in bond market growth. According to the results, it's indicated that when the diaspora is introduced as a moderator, the explanation power of inflation rate increases to 21.99289.

The results show that inflation rate has a significant influence on the growth of bond markets in Kenya. Specifically, the study findings revealed that inflation rate plays an important role in the growth of bond market in Kenya. The long run relationship is positive for inflation rate on bond market growth. The positive coefficient of 21.99289 for inflation after moderation is larger than for control model of 0.300448 and a significant p-value. Thus, this section concludes that remittance variable is a relevant moderator.

This result corroborates the findings of Mohammad (2011), who conducted a study on Bangladesh between 2002 and 2009 using OLS and the Granger causality test and found a positive influence between inflation and bond prices. A study conducted by Lee (2012) agrees with these findings by revealing a positive influence between inflation and bond prices in the US. The study disagrees with that of Gallagher and Taylor (2012), who found a negative influence between bond returns and the rate of inflation. Further, the study disagrees with the findings of Kullapom and Lalita

(2010), who examined the correlation between inflation and stock prices in Thailand using a VAR model. Their findings revealed that stock price fluctuations have no effect on inflation.

Interest Rate

The results in table 4.38 show the regression coefficients of regression model where diaspora remittance is used as a control variable and as a moderator variable Regression of coefficients results in table 4.58 above shows that interest rate and Bond market growth were positively related (r=0.321063X_{2t}, p=0.0000). The study findings revealed that the interest rate had a strong influence on the growth of bond market with insignificant p value.

The study findings revealed that the interest rate had a strong influence on the growth of bond market with insignificant. Before moderation a positive coefficient of inflation rate was 0.321063 implying that the interest rate and bond market growth move in the same direction. It is concluded that 1 unit change in interest rate causes 0.321063 unit changes in bond market growth.

After moderation in the second model, it's revealed that when the diaspora remittance is introduced as a moderator the explanation power of interest rates increases to 6.506514. This implies that there is a statistically significant effect of diaspora remittances as a moderator. The study findings reveal that the inflation rate had p value of greater than 0.05 which is insignificant and when the p regressed values changes to 0.0000 that is less 0.05 and significant.

The results show that interest rate has significant influence on the growth of bond markets in Kenya. Specifically, the study findings revealed that interest rate plays an important role in the growth of bond market in Kenya. The long run relationship is positive for interest rates on bond market growth. The positive coefficient of 6.506514 for interest rates after moderation is larger than for control model of 0.321063 and a significant p-value. Thus this section concludes that remittance variable is a relevant moderator for interest rate.

Okafor (2018) conducted research on major determinants of bond market development in Nigeria and South Africa and found that interest rate is a major determinant of bond market growth in both countries. As a result, the findings of this study are consistent with those of other studies such as; Munguci (2019); Nuwagaba (2013); Wuhan and Khursid (2015); Smales (2017) who found that interest rate has a significant influence on the bond market growth

Exchange Rate

The results in table 4.38 show the regression coefficients of regression model where diaspora remittance is used as a control variable and as a moderator variable Regression of coefficients results in table 4.58 above shows that exchange rate and Bond market growth were positively related (r=2.180199X_{3t}, p=0.0000). The study findings revealed that the exchange rate had a strong influence on the growth of bond market with significant p value. Before moderation a positive coefficient of exchange rate was 2.180199 implying that the exchange rate and bond market growth move in the same direction. It is concluded that 1 unit change in interest rate causes 2.180199 unit changes in bond market growth.

After moderation a positive coefficient of exchange rate was 44.45904 implying that the moderated exchange rate and bond market growth move in the same direction. It is concluded after introducing a moderating effect of diaspora remittance, 1 unit change in moderated exchange rate causes 44.45904 unit changes in bond market growth. The second model show that when the diaspora is introduced as a moderator, the explanation power of exchange rate increases to 44.45904. Finally, when the interaction term was introduced in the second model the results show that there is a statistically significant effect of diaspora remittances as a moderator.

The results show that exchange rate has significant influence on the growth of bond markets in Kenya. Specifically, the study findings revealed that exchange rate plays an important role in the growth of bond market in Kenya. The long run relationship is positive for exchange rate on bond market growth. The positive coefficient of 44.45904 for exchange rate after moderation is larger than for control model of

2.180199 and a significant p-value. Thus, this section concludes that remittance variable is a relevant moderator for exchange rate.

Findings from the secondary data seem to agree with findings made by Le, Nguyen, and Nguyen (2015), who investigated the influence of macroeconomic variables on the growth of corporate bond markets using the Generalized Method of Moments (GMM) model and found the exchange rate has a positive impact on corporate bond issuance. Francová (2018) used an OLS linear regression analysis approach to examine the effects of selected factors on the US bond market and discovered that changes in the exchange rate have a positive and significant impact on bond prices.

Gross Domestic Product

The results in table 4.38 show the regression coefficients of regression model where diaspora remittance is used as a control variable and as a moderator variable Regression of coefficients results in table 4.58 above shows that GDP and Bond market growth were positively related (r=2.468579X_{4t}, p=0.0000). The study findings revealed that the GDP had a strong influence on the growth of bond market with significant p value. Before moderation a positive coefficient of GDP was 2.468579 implying that GDP and bond market growth move in the same direction. It is concluded that 1 unit change in GDP causes 2.468579 unit changes in bond market growth.

After moderation a positive coefficient of GDP was 16.40064 implying that the moderated GDP and bond market growth move in the same direction. It is concluded after introducing a moderating effect of diaspora remittance, 1 unit change in moderated GDP causes 16.40064-unit changes in bond market growth. The second model show that when the diaspora is introduced as a moderator, the explanation power of GDP increases to 16.40064. Finally, when the interaction term was introduced in the second model the results show that there is a statistically significant effect of diaspora remittances as a moderator.

The results show that gross domestic product has significant influence on the growth of bond markets in Kenya. Specifically, the study findings revealed that GDP plays an important role in the growth of bond market in Kenya. The long run relationship is positive for GDP on bond market growth. The positive coefficient of 16.40064 for gross domestic product after moderation is larger than for control model of 2.468579 and a significant p-value. Thus, this section concludes that diaspora remittance variable is a relevant moderator for gross domestic product.

The study collaborated with the findings of Musah (2019) investigated the impact of bond market determinants on the development of the Ghanaian bond market, using VECM found that GDP has a positive influence on the development of Ghanaian bond market. Didia and Ayokunle (2020) also conducted similar study in Nigeria and used ARDL test and external debt was found to be a long-term growth impediment

The study collaborated with the findings of Mohamed (2019) who carried a research on remittances and economic growth in Uganda. Using the ADF tests for testing stationary and period is between 1993 and 2017 found significant positive impact between remittance and economic growth. The study also agrees with that of Masuduzzaman (2014) who examined the role of remittances in economic growth in Bangladesh with data from 1981 to 2013, using Johansen co-integration test, as well as the vector error correction model and Granger Causality tests the study found a significant positive influence. Further, the study agrees with Wanyoike (2015) who studied the influence of diaspora remittance and stock market performance and using time series regression model found a positive relationship between diaspora remittances and stock market performance

Table 4.39: Summary For the Hypothesis

S/no	Hypothesis	Decision
H_{01}	Inflation rate has no significant influence on growth of bond market	Reject H_{01}
H_{02}	Interest rate has no significant influence on growth of bond market	Reject H_{02}
H_{03}	Exchange rate has no significant influence on growth of bond market	Reject H_{03}
H_{04}	Gross domestic product has no significant influence on growth of bond market	Reject H_{04}
H_{05}	Diaspora remittance has no significant moderating effect on the relationship between macroeconomic variables and bond market growth	Reject H_{05}

4.10 Summary

This chapter set to investigate the influence of macroeconomic variables on the bond market growth in Kenya. The chapter employed various techniques to evaluate the dynamics in the individual variable. The chapter employed the usual descriptive statistics to assess the characteristics of the study variables. These included the mean, median Jaque Bera test, skewness and kurtosis. The chapter also employed several diagnostic tests such as heteroskedasticity to establish stability of variance, the autocorrelation to determine the serial correlation, ARMA analysis to determine lagged terms and their effect on individual variables. The section also employed the unit root to test the stationary of the macroeconomic variables. Granger causality was used to test the direction of influence to the paired variables. Cointegration was used to evaluate the long run relationship between the independent variables and dependent. The study also used graphs to make pictorial presentations where applicable to show the relevant patterns.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, a summary of the findings is presented as guided by the study objectives. Conclusions are drawn based on the information gathered. Finally, policy and managerial recommendations were presented for practice, as well as suggestions for further studies.

5.2 Summary of the Study

This study sought to examine the macroeconomic variables and the growth of bond markets in Kenya. Macroeconomic variables studied include inflation rate, interest rate, exchange rate, and gross domestic product, with diaspora remittance being used as the study's moderating variable. The summary of the key findings was clearly provided as guided by the specific objectives of the study and conclusions drawn based on the information gathered. The study's conclusions were drawn at 95% statistical confidence level. The respective hypotheses tested have been described in this chapter from which recommendations were drawn with suggestions to guide further studies in the area of study.

5.2.1 Inflation Rate and Growth of Bond Markets in Kenya

The first objective of the study was to examine the inflation rate and the growth of bond markets in Kenya. Secondary data was collected from the Central Bank of Kenya, Nairobi Securities Exchange, and Kenya National Bureau Statistics. The study used time-series regression model for data analysis. The study revealed that 84% of the change in the growth of bond market could be accounted for by changes in the macroeconomic variables.

From the findings, the correlation coefficient (r) of the study was found to have a strong positive relationship between macro economic variables and the growth of bond markets. The study further revealed that the regression model had a significant

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p value of 0.000, which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. Overall, the regression model predicts the growth of the bond markets significantly well at a 95% confidence level. This indicates that, statistically, the model applied can significantly predict the changes in the growth of bond markets. The study further revealed that the inflation rate significantly influences the growth of bond markets in Kenya.

From the data analysis, it was revealed that there exists a positive and significant relationship between the inflation rate and the growth of the bond market. This implies that an increase in inflation leads to a better growth rate in the bond market. This study also found out that just like the inflation rate was significant in influencing the growth of bond markets, the moderating variable of diaspora remittance was also a significant moderator in the relationship between the inflation rate and growth of bond markets in Kenya.

5.2.2 Interest Rate and the Growth of Bond Markets in Kenya

The second objective of the study was to establish the effect of interest rates on the growth of bond markets in Kenya. Secondary data was collected from CBK, NSE and KNBS and time series regression model was used in the data analysis. The study revealed that 84% of the change in bond market growth could be accounted for by changes in macroeconomic variables.

From the findings of r, which is the correlation coefficient, the study found that there was a strong positive relationship between the study variables. The study further revealed that the regression model had a significance level of 0.000, which is an indication that the data was ideal for making conclusions on the population parameters as the value of the significance p-value was less than 5%. Overall, the regression model predicted the bond market's growth significantly well at 95% confidence level. This indicates that, statistically, the model applied can significantly predict the changes in bond market growth. The study further revealed that interest rates significantly influence the growth of bond markets in Kenya.

From the data analysis, it was revealed that there was a positive relationship between interest rates and the growth of the bond market. This reveals that an increase in interest leads to an improvement in the growth rate in the bond market. The study also found that the moderating variable of diaspora remittance has a significant moderating influence on the relationship between interest rates and the growth of bond markets in Kenya.

5.2.3 Exchange Rate and Growth of Bond market in Kenya

The third objective of the study was to determine the influence of the exchange rate on the growth of bond markets in Kenya. Secondary data was collected from CBK, NSE, and KNBS and time series regression model was used in the data analysis. The study revealed that 84% of the change in bond market growth could be accounted for by macroeconomic variables.

From the findings of r, which is the correlation coefficient, the study found that there was a strong positive relationship between the study variables. The study further revealed that the regression model had a significance level of 0.000, which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%. Overall, the regression model predicted growth of bond markets significantly well at 95% confidence level. This indicates that, statistically, the model applied can significantly predict the changes in bond market growth. The study further revealed that the exchange rate significantly influences the growth of bond markets in Kenya.

From the data analysis, it was revealed that there was a positive and significant relationship between the exchange rate and the growth of the bond market. This implies that both the exchange rate and growth of bond market move in the same direction with significant influence. The moderating variable of diaspora remittance also had a significant moderating influence on the relationship between the exchange rate and growth of bond markets.

5.2.4 Gross Domestic Product and Growth of Bond Market in Kenya .

The fourth objective of the study was to determine the influence of the gross domestic product rate on the growth of bond markets in Kenya. Secondary data was collected from CBK, NSE, and KNBS and time series regression model was used in the data analysis. The study revealed that 84% change in growth of bond markets could be accounted for by changes in macroeconomic variables.

From the findings of r, which is the correlation coefficient, the study found that there was a strong positive relationship between the study variables. The study further revealed that the regression model had a significance level of 0.000, which is an indication that the data was ideal for making conclusion on the population parameters as the value of significance (p-value) was less than 5%.

Overall, the regression model predicted the growth of bond markets significantly well at 95% confidence level. This indicates that, statistically, the model applied can significantly predict the changes in bond market growth. The study further revealed that the gross domestic product rate significantly influences the growth of bond markets in Kenya.

From the data analysis, it was revealed that there was a positive and significant relationship between gross domestic product and the growth of the bond markets. This implies that an increase in gross domestic product leads to a better growth rate in the bond market. Meaning that both gross domestic product and bond market growth move in the same direction with a significant influence. The moderating variable of diaspora remittance also had a significant moderating influence on the relationship between gross domestic product and growth of bond markets.

5.2.5 The Moderating Effect of Diaspora Remittance on the Relationship between Macroeconomic Variables and Growth of Bond Markets in Kenya

The study carried out an analysis on the moderating effect of diaspora remittances on the relationship between macroeconomic variables and bond market growth in Kenya. The study revealed that 85.1% of the change in bond market growth could be

accounted for by the moderated macroeconomic variables. From the findings of r, which is the correlation coefficient, the study found that there was a strong positive relationship between the study variables. The study further revealed that the regression model had a significance level of 0.008, which is an indication that the data was ideal for making a conclusion on the population parameters as the value of significance (p-value) was less than 5%.

Overall, the regression model predicted bond market growth significantly well at 95% confidence level. This indicates that, statistically, the model applied can significantly predict the changes in bond market growth. The study further revealed that diaspora remittance has a significant moderating effect of macroeconomic variables on the growth of bond markets in Kenya.

From the data analysis, it was revealed that there was a positive significant influence of the inflation rate, interest rate, exchange rate, and GDP on the growth of bond markets with coefficients of 21.99289, 6.506514, 44.45904, and 16.40064, respectively. The moderating variable of diaspora remittance also had a significant moderating influence on the relationship between macroeconomic variables and bond market growth.

5.3 Conclusion of the Study

From the findings, the study concluded that the model was significant in explaining the effect of the macroeconomic variables on the growth of bond markets in Kenya. The inflation rate was a significant predictor of the dependent variable in this study with p-value of 0.011 (p-value<0.05). The interest rate was also significant to explain the bond market growth with a p value of 0.000<0.05.

The exchange rate was a significant predictor, as shown in the analysis p-value of 0.000<0.0 5 to the growth of the bond market. Finally, gross domestic product was a significant predictor of the bond market growth in Kenya with (a p-value of 0.000<0.05). Further the study established that when the diaspora remittance was included as a moderating variable in the model, the study revealed that macroeconomic variables positively and significantly influence bond market growth.

5.3.1 Inflation Rate and the Growth of Bond Markets in Kenya

Based on the regression analysis, the results showed a positive and significant influence of the inflation rate on bond market growth in Kenya. From the data analysis outcomes, the study concluded that the inflation rate has a positive influence on growth of bond markets in Kenya. This means that an increase in inflation rate would enhance the growth of the bond markets.

Conversely, a reduction in the inflation rate would reduce the growth of the bond markets. Furthermore, the study concluded that inflation rate influence was significantly and positively moderated by diaspora remittances to enhance its influence on the growth of bond markets in Kenya.

5.3.2 Interest Rate and the Growth of Bond Markets in Kenya

Based on the regression analysis, the results showed a positive and significant influence of the interest rate on the growth of bond market in Kenya. From the data analysis outcomes, the study concluded that interest rates had a positive influence on bond market growth in Kenya. This means that an increase in interest rate would enhance the growth of the bond market.

Conversely, a reduction in the interest rate would reduce the growth of the bond market. Furthermore, the study concluded that interest rate influence was significantly and positively moderated by diaspora remittances to enhance its influence on the growth of bond market in Kenya.

5.3.3 Exchange Rate and the Growth of Bond Markets in Kenya

Based on the data analysis, the study concluded that there was a strong relationship between the exchange rate and the growth of bond markets in Kenya. Regression results showed a positive and significant influence of the exchange rate on bond market growth in Kenya. From the data analysis outcome, the study concluded that the exchange rate has a positive influence on the growth of bond markets in Kenya. This means that an increase in the exchange rate would enhance the growth of the bond markets.

Conversely, a reduction in the exchange rate would reduce the growth of the bond markets. Furthermore, the study concluded that exchange rate influence was significantly and positively moderated by diaspora remittances to enhance its influence on the growth of bond markets in Kenya.

5.3.4 Gross Domestic Product and the Growth of Bond Markets in Kenya

Based on the data analysis, the study concluded that there was a strong relationship between gross domestic product and the growth of bond markets in Kenya. Regression results showed a positive and significant influence of gross domestic product on the growth of bond markets in Kenya. From the data analysis outcome, the study concluded that gross domestic product has a positive influence on the growth of bond markets in Kenya. This means that an increase in gross domestic product would enhance the growth of the bond markets.

Conversely, a reduction in the gross domestic product would slow the growth of the bond market. Furthermore, the study concluded that gross domestic product influence was significantly and positively moderated by diaspora remittances to enhance its influence on the growth of bond markets in Kenya.

5.4 Recommendations of the Study

On the basis of the analyzed results, the study offers both policy and managerial recommendations.

5.4.1 Policy Recommendations

On the basis of the analyzed results, the study recommended that it is essential to consider the relationship between macroeconomic variables and the growth of bond markets in Kenya when formulating bond market policy. Since the bond market is a key source for government financing long term projects, there is a need to ensure the stability of the macroeconomic variables and everything is done in accordance with well-formulated policies for the steady growth of the bond markets in the country.

A number of policy recommendations were outlined from the study findings;

The study recommended that the Central Bank of Kenya to regularly review the policy on monetary issues that is the discount rate and the reserve requirements to regulate the inflation levels in the economy. The study recommended that the CBK should apply monetary policies and regulations to monitor exchange rate fluctuations and control the depreciation of the shilling

The study recommends the policy makers should come up with policies and measures; for example good infrastructure, efficient water and energy services, improve security and using tax reforms regulations that improves the productivity in the country. The national assembly therefore needs to provide a conducive environment for diaspora investors through the formulation of favorable investment policies, ensuring political stability, minimizing bureaucracy, and managing corruption.

5.4.2 Managerial Recommendations

The study recommended the government and regulatory agents (CBK) to control interest rate charged, thus stabilizing the rates to encourage investments for example; direct intervention by government of Kenya, in buying or selling securities in open markets.

The government should devise measures that would boost investor confidence thus attract increased diaspora remittances through organizing constant briefs with diaspora remittance communities about investment opportunities in Kenya. Further, the government should institute aggressive campaigns targeting the Kenyans living in the diaspora to educate them on the importance of investing back home.

It is recommended that the government can spur the bond market's growth by enticing Kenyans in the Diaspora to invest in the Nairobi Securities Exchange. With this plan, the county will be able to more accurately account for the remittances as well as witnessing it enter formal investments.

5.5 Areas for Further Research

The study recommends further investigation to be done to include other macroeconomic variables not investigated in the study. The study focused on macroeconomic variables, it is therefore recommended further studies be done on other macroeconomic factors not covered in the study and the growth of the bond markets.

It is also recommended that further studies be carried out to include other emerging economies in the region, such as Eastern African countries. This would make it possible for these countries to formulate sound policies to assist them in developing their bond markets. Further, its recommended research to be conducted at the micro level to determine the influence of microeconomic variables on the growth of bond markets in Kenya because since this study focused at macro level.

Studies on the impact of non-economic shocks and the growth of bond markets should be conducted. Political interventions and corruption are examples of non-economic shocks. Research on causal relationships should also be conducted to determine whether causality exists, what type it is, and what policy implications it has. Studies should also be conducted to assess if the sensitivity of macroeconomic variables has changed over time. Further research on the determination of news on the growth of bond markets will help investors make rational investment decisions and will assist regulators in policy formulation. This will be aided by the use of other methodologies not used in conducting this study.

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APPENDICES

Appendix I: Secondary Data Collection Sheet

Data was collected and reviewed for a period of 240 monthly observation as scheduled below.

Year	Month	Inflation Rate (CPI)	Commercial Bank Lending Rate	Ksh/USD	Value of Remittances	GDP (Income of the country)	Value of the Bond Market
2001	Jan-Dec						
2002	Jan-Dec						
2003	Jan-Dec						
2004	Jan-Dec						
2005	Jan-Dec						
2006	Jan-Dec						
2007	Jan-Dec						
2008	Jan-Dec						
2009	Jan-Dec						
2010	Jan-Dec						
2011	Jan-Dec						
2012	Jan-Dec						
2013	Jan-Dec						
2014	Jan-Dec						
2015	Jan-Dec						
2016	Jan-Dec						
2017	Jan-Dec						
2018	Jan-Dec						
2019	Jan-Dec						
2020	Jan-Dec						