

**EFFECT OF MACRO ECONOMIC FACTORS ON BOND MARKET PERFORMANCE
IN KENYA**


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DECLARATION

This research Project is my own original work and has never been presented for a degree at any other university for examination.


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ABSTRACT

Equity and bond markets are essential to creating higher economic efficiency. For strong economic development, a well-functioning financial sector is a critical component. By presenting investment opportunities to local and international savers and financing the government's budget deficit, the Kenyan bond market is crucial to the country's economic growth. The domestic bond market in Kenya, on the other hand, is relatively tiny compared to the rest of the globe, although it is rated third in sub-Saharan Africa in terms of market size. Even in the face of the country's economic difficulties, this market remains crucial for government bonds. Macroeconomic variables were examined in this research to see how they affected the performance of the Kenyan bond market. Specifically, the research intended to examine the impact of interest rate, inflation rate, foreign currency rate, money supply, and equities market performance on bond market performance in Kenya. The analysis found statistically significant positive correlations between interest rates and bond market turnover and between the money supply and bond market development. Exchange rate and bond market development are statistically linked in a negative manner. There is no statistical significance to the correlation between the inflation rate and bond market development. The negative relationship between equity market performance index and bond market development is also established as not statistically significant. On dual causality, equity market performance exhibits dual causality relationships with the bond market performance, Bond market performance has dual causality with interest rates, equity market performance exhibit dual causality with exchange rates, money supply exhibits dual causality with bond market turnover and money supply exhibits dual causality with interest rates. The study recommends that the Government and Regulatory agencies should strengthen the interest rate regulatory framework so as to infuse economic development in diverse sectors of the Kenyan economy. The money supply as a responsibility of the central bank should be modelled to encourage private borrowing, bond market development and credit creation. A proactive approach to controlling macro-economic issues in the economy is also suggested by state and economic planners. Concentrate on factors that worsen corporate bond performance, such rising inflation and changing currency rates. For a longer research period, the paper advises a study using a variety of lagged macroeconomic parameters and the performance of bond markets in a regional context. Research on the impact of industry and company-level characteristics on the performance of corporate bonds should be conducted in the near future. Bond market failure in an economy may be studied in more detail, as can its origins and repercussions. Other emerging regions, such as East Africa, may be included in a research to help these nations create effective policies in the bond market.

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ABBREVIATIONS AND ACRONYMS

ANOVA	:	Analysis of Variance
APT	:	Arbitrage pricing Theory
BP	:	Bond Performance
CBK	:	Central Bank of Kenya
CMA	:	Capital Markets Authority
EMH	:	Efficient Market Hypothesis
ER	:	Exchange Rate
GCF	:	Gross Capital Formation
GDP	:	Gross Domestic Product
IL	:	Inflation Rate
KES	:	Kenya Shillings
KNBS	:	Kenya National Bureau of Statistics
IR	:	Interest Rate
LR	:	Likelihood Ratio
MEV	:	Macro-Economic Variable
MS	:	Money Supply
MST	:	Market Segmentation Theory
NSE	:	Nairobi Securities Exchange
OLS	:	Ordinary Least Squares
PPP	:	Purchasing Power Parity
SSA	:	Sub Saharan Africa
VIF	:	Variance Inflation Factor

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Financial markets can be used to improve the economy in a variety of ways. Financial sector health has a direct association with economic development (Mishkin & Eakins, 2012). A country's bond market must grow in order to preserve the health of its financial and economic institutions. A wide variety of macroeconomic, industry, market, and firm-level variables may affect the bond market (Sprcic & Wilson, 2017).

In Campbell (1980), the market segmentation theories, there is no correlation between bond markets with various maturities since interest rates impact supply and demand for bonds. These linkages are shown in the expectations theories of Fisher (86), Hicks (1946), and Lutz (1951). To better understand the dynamics of financial markets, Fama (1970) developed a theory of market efficiency. Models established by Dornbusch and Fisher (1980) show the link between macroeconomic characteristics and financial market performance.

In order to promote economic progress, the Kenyan bond market provides investment options to local and international investors and helps the government to meet its budget deficit (Maina and Kimutai, 2018). By offering investment opportunities for both local and international investors, Kenya's bond market helps to boost the country's economic development, according to Fredrick (2014). The Kenyan bond market is purely regional; it is not a part of the global market at all. Primary and secondary bond markets exist for both government and business bonds on the domestic market. According to Maina and Kimutai, Kenya's domestic bond market ranks third in Sub-Saharan Africa, behind South Africa and Nigeria (2018). Because it allows the government to generate money locally to offset its budget shortfalls, this market will likely remain crucial going forward.

1.1.1 Macro-Economic Factors

Macroeconomics, according to Romer (2012), is the study of the economy as a whole. Research shows that macroeconomics is concerned with the overall functioning of the economy. According to Brunner's (2012) definition, macroeconomic variables are those that have a major effect on the economy at a regional or national level. It is important to note that these

characteristics influence the whole population, not just a few individuals. All stakeholders, including company owners, customers, the government, commercial and service businesses, and others, are affected by these factors.

Income, production, and interdependencies across various economic sectors are examples of macroeconomic elements that are relevant to a country's total economy. In a favorable macroeconomic climate, businesses are able to obtain securities for long-term expansion, which is a result of increased profitability. Economic health may also be gauged by factors such as real GDP growth, inflation, the currency rate, and fiscal and debt balances (Asaolu and Ogunmuyiwa, 2010 and Elly and Oriwo, 2013).

Interest rate, inflation rate, money supply, foreign exchange rate, and GDP are macroeconomic factors that impact financial market activity, according to Ouma and Muriu (2014). The financial statistics of the economy may be affected positively or negatively depending on the interest rate policy of the central bank.

1.1.2 Bond Market Performance

There are three characteristics of financial instruments, such as performance, risk and yield that are correlated. The capacity of a market to handle a high number of transactions without significantly altering the price is a critical component of market microstructure (Thomas, 2015). As long as there isn't a countervailing premium paid, holding an asset that hasn't performed will be less appealing than selling it for the same amount of money. Only when it's absent is performance evident to markets, like oxygen is to people (Das, Ericsson & Kalimipalli, 2013).

In order for an economy to get the full benefits of a bond market, it must be liquid, efficient, and more stable (Mbewa et al., 2014). A market's ability to perform is a good sign of how efficient and active it is. If the market is large enough, it is likely to have a high turnover rate compared to its size. Secondary-market pricing are more likely to be information-efficient when a market is more liquid (Holstrom & Tirole, 2017). There are several advantages to trading on the open market in liquid marketplaces. Investors find them more appealing since they are more convenient to trade. With these products, investors may also change the composition of their

portfolios. A more stable currency transmission mechanism may be achieved by enabling financial institutions to tolerate wider asset-liability mismatches and allowing the central bank to deploy indirect monetary instruments (Sarr & Lybek, 2012).

Liquidity in a market breeds activity, which in turn draws more market participants, creating a positive feedback loop in which the market grows both more liquid and more efficient with each passing year. The growth process calls for a market with low transaction costs and volatility, as well as excellent performance and efficiency. In their study, Gwalani and Bharat (2013) found that the advantages of liquid markets include better allocation of financial resources, a more stable financial system, and assistance to financial institutions in dealing with massive asset-liability mismatches.

1.1.3 Macro-Economic Factors and Bond Market Performance

According to McKinnon and Shaw, macroeconomic factors such as real interest rates, the money supply, and inflation have an influence on a wide range of economic fundamentals (1973). Although interest rates might boost the demand for investment, they do not really increase the amount of actual investment.

Bond markets are affected by a variety of macroeconomic, industry, market, and firm-specific variables (Spric & Wilson, 2017). For the market level factors, Eichengreen and Luengnaruemitchai (2014) identify interest rate variability to be having a huge impact on bond market development. Bond market performance is influenced by a number of macroeconomic factors like the exchange rate, interest rates, and volatility of the exchange rate, according to Bhattacharyay (2013).

Drivers of bond market performance are noted in Adelegan and Redzewicz-Beck (2009) and Mu et al. (2003) include fundamental institutional factors such as political stability (political risk), regulatory framework, democratic accountability, corruption, bureaucratic quality among others. According to Kahn (2005), Fredrick (2014), Soek (20120), Dickie and Fan(2005), inflation, interest rates, banking sector growth, exchange rates, foreign direct investments, fiscal balances and trade openness, and economic size all impact bond market performance.

1.1.4 Bond Market in Kenya

Bond markets in Africa are still in their infancy, with government and corporate bonds still accounting for most. Many African nations' bond markets, including Kenya, have recently been quite active, so things may be changing (Kibua et al, 2005). The government has made a big effort to aid in the growth of this business by granting incentives. Kenya's government has significantly lowered withholding tax on corporate bonds having a maturity of 10 years or more from 15% to 10% in an attempt to boost bond trading. As a consequence, listing costs decreased significantly (Kihuro, 2009).

The Kenyan bond market is a regional market. Government and business bonds are traded on the local market. Kenya's domestic bond markets were worth \$16.45 billion (KES 1.645 trillion) at the end of March 2018, or 21.94 percent of its \$74.94 billion GDP (CBK report, 2018; CMA Quarterly report 2018). The government bond market offers a wide variety of bonds, including those with fixed coupon rates, zero coupon rates, variable rate rates, restructuring bonds, amortizing bonds, and development bonds (Maina and Kimutai, 2018, 2019).

A company's bonds might be secured or unsecured in the corporate market. Bonds are available for terms ranging from one year to thirty years on both markets. Kenya's bond market, behind South Africa and Nigeria, with daily activity of \$70 million to \$100 million. Secondary trade has slowed since late 2015 due to changing economic circumstances and increasing short-term debt interest rates (Maina and Kimutai, 2018).

1.2 Research Problem

Financial crises throughout the globe have emphasized the necessity for countries to diversify their financial portfolios via healthy bond markets. Additionally, they will be able to support quick and sustainable infrastructure expansion, which will ultimately lead to increased economic growth (Musah, et al., 2019). Every bond market (whether developed or emerging market) is characterized with macroeconomic factors, no doubt. These macroeconomic factors directly (indirectly) impose challenges on the bond market. The influence and challenges of these macroeconomic factors have generated phenomenal academic debate (Nkwede, 2020). The

ability of investors to quickly and cheaply sell their bonds on the secondary market is critical to the smooth operation of the bond market (Backberg, 2014).

The bond, according to Nkwede (2020), is plagued by poor performance, excessive volatility, and inefficiency in most debt markets throughout Africa. Ndung'u believes that despite Kenya's well-diversified bond market, it has to be extended even more (2013). Most of Kenya's business bonds have failed to perform well (Ngabirano, 2016). Research by Baraza (2014) and Wanjiru (2015) shows that Kenya's loan market is undeveloped and narrow. A lack of a yield curve to price long-term assets is highlighted by Ochenge (2014) as a result of institutional investors' dominance and an uneven and volatile interest rate structure.

According to Beck et al. (1999), the size of the global bond market correlates with per capita GDP. According to Eichengreen and Luengnamemitchai (2004), macroeconomic policy has a dualistic function in Asia, supporting and stifling the growth of Asian bond markets simultaneously. According to Adelegan and Radzewicz (2009), high interest rates deter issuance and market growth, whereas exchange rate flexibility promotes market development.

Christensen (2004) demonstrated regionally that African nations' domestic debt markets are tiny, extremely speculative, and often have a limited investor base. According to Mu and colleagues (2013), despite consistent growth, African bond markets are immature because government securities market capitalization is connected to interest rate volatility but not spread or currency rate volatility. Money supply is critical to the expansion of Ghana's corporate bond market, according to Musah et al. (2019). Capitalization of the Nigerian bond market was negatively impacted by a combination of currency, interest, and inflation rates, according to Nkwede (2020).

In Kenya, exchange rates, interest rates, and GDP per capita all contributed to the expansion of the bond market, while purchasing power parity had a negative impact, according to Fredrick (2014). Kamenju (2018) confirms that interest rates, inflation rates, and currency volatility all have a favorable effect on the bond market's development. Mugo (2018) found that although currency and interest rates harmed bond market performance, inflation had a favorable influence.

A substantial negative link between corporate bond performance and currency rates, interest rates, and inflation rates was found by Maina and Kimutai (2018). The contradicting results from the preceding studies prompt the following research question: What influence do lagged macroeconomic factors have on the performance of the corporate and government bond markets in Kenya?

1.3 Research Objectives

The major objective of the research was to determine the effect of macroeconomic variables on the performance of Kenya's bond market. Specifically, the study sought to determine the influence of:

- i. Interest rate on bond market performance in Kenya
- ii. Inflation rate on bond market performance in Kenya
- iii. Foreign exchange rate on bond market performance in Kenya
- iv. Money supply on bond market performance in Kenya
- v. Equity Market Performance on bond market performance in Kenya

1.4 Value of the Study

The research makes a significant addition to both theoretical and practical aspects of the field. Information gaps that are identified in the study may serve as a foundation for future research, and the study contributes to this body of knowledge. This study might lead to further research into macroeconomic issues and how they impact bond market performance. For scholars and researchers, this study's findings will be of great use.

The results are also useful for policymakers. Regulatory regimes that support economic stability and growth rely heavily on macroeconomic conditions. The suggestions of this research inform policy formation on the bond market, resulting in enhanced bond performance in Kenya.

Investors in the bond market will be interested in the conclusions of this research. Young Kenyan investors may greatly benefit from the capacity to forecast future bond market developments. In

this way, they are better able to choose where and when to invest in the Kenyan bond market. Investors, both present and future, will be better informed about the variables that influence their investments and the bond market's performance. In this way, they are able to make meaningful investment choices.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter studies macroeconomic factors and their impact on corporate bond markets. There is a discussion of the empirical and theoretical review, as well as the overview of the literature, the conceptual framework, and the research gaps that it was meant to cover.

2.2 Theoretical Literature Review

Theory of market segmentation, theory of expectations, theory of market efficiency, and flow-oriented model are all used to guide this research.

2.2.1 Market Segmentation Theory

Tim Campbell came up with the theory of market segmentation in 1980. When it comes to interest rates and bond supply and demand, Smithin (2003) asserts that there is no correlation between bond markets of various maturity lengths. A short-term interest rate has minimal impact on long-term interest rates. According to this theory, only short-term rates can reliably anticipate future interest rates.

Long and short-term interest rates must be evaluated separately. In other words, a change in one isn't always a hint that the other will change quickly (Terrell & Frazer, 1976). Market expectations can only be derived from the long-term interest rate, which does not always predict the outcome of a financial transaction. Smaller markets emerge as a result of these decisions, each with its own set of market dynamics. Market variables affecting short-term government and corporate bonds, for example, are impacted by the short-term asset needs of businesses, such as debtors and inventory (Smithin, 2003). Long-term bonds, on the other hand, tend to be driven by

the financing of large-scale capital expenditures by corporations (Korkut, 2006). Bond market segments function independently of each other because investors and borrowers strive to hedge at each maturity length. Segmented market theory is another name for market segmentation (Korkut, 2006). Bond maturities are divided into sections, and each section's market is dominated by investors who have a particular interest in that section's maturities (Terrell & Frazer, 1976).

According to Segmented Market Theory, buyers and sellers in the short term bond market display a wide range of behavior and investment objectives that are distinct from those of buyers and sellers in the medium- and long-term securities markets (Smithin, 2003). Quiry et al. (2005) pointed out that bond investors had a preference for maturity lengths in their criticism. It is only if a higher return is available outside of the investor's favored market that they will consider acquiring bonds with varying maturities. A higher return on longer-term bonds than on shorter-term bonds will attract investors who generally only purchase short-term bonds in order to improve their profits. This theory helps to explain why current macroeconomic variables cannot be utilized to forecast the future environment. It enables investors to put their money to work without having to depend on the present state of the economy.

The theory supports the study as it looks at the behavior of investors and other players in the bond market including the banking and the insurance industries. Banks would always prefer to finance short term projects and issue short term bonds while the government would go for long term bonds. Additionally, insurance companies prefer long term projects as well. Hence, the theory elaborates on why there is need to establish how interest rate at a given time; whether short or long term would predict future rate which can have the impact on bond market performance in the country.

2.2.2 Expectations Theory

The average of the current and prospective one-year interest rates is used by Fisher (1986), Hicks (1946), and Lutz (1951). Long-term interest rates are believed to be a reflection of short-term interest rate expectations in the marketplace. Inflation is predicted to be contained if the yield curve slopes downward.

The form of the yield curve is affected by market participants' expectations of future interest rates and their uncertainty about their accuracy. When interest rates vary, short-term bonds tend to have an upward sloping yield curve because investors seek a risk premium for such bonds.

According to Russell (1992), the expectations theory may explain two main stylized occurrences related to yield curves. The slope and steepness of these curves fluctuate in lockstep with changes in short-term interest rates, but that's not all. Because they expect short-term rates to fluctuate over time, foresighted lenders won't acquire term securities until long-term interest rates reflect these fluctuations.

2.2.3 Market Efficiency Theory

According to EMH formulated by Fama (1970), assets (stocks and bonds) are held at equilibrium, with their values published as public information that can be accessed and acted upon instantly. As a result, investors are more likely to take prompt action when assets are priced properly and completely. In a nutshell, the objective is to develop a market where the price reflects appropriate indications for apportionment of money. Assuming this theory is correct, the price of a security should represent the information that is currently accessible. In order to be an effective market, it states that prices must reflect all of the available information.

Markets for the trading of stocks and bonds facilitate price discovery, liquidity, cost reduction, and risk transfer. It is essential to the growth of the financial sector that capital markets be developed, since they complement banking systems' roles as economic drivers. Yartey and Adjasi (2007) claim they help reduce information costs by creating and sharing information with other enterprises, resulting in efficient marketplaces where prices reflect current market knowledge. Growth in the home economy is supported by efficient markets. In addition to providing investors with access to capital, efficient markets move funds into local economies. Having no bond or stock markets has encouraged activity in the credit market, with deposits accounting for a large amount of their financial asset portfolios.

A number of macroeconomic factors, such as inflation, currency rates, and the money supply, were identified by several academics as a factor in the performance of bonds (Elly and Oriwo, 2012). The EMH allows for the premise that changes in key macroeconomic characteristics have a direct influence on the performance of corporate bonds. As a consequence, the study aims to identify the predicted link between important macroeconomic parameters and the performance of Kenyan corporate bonds.

2.2.4 Flow Oriented Model

As advanced in Dornbusch and Fisher (1980), changes in interest rates at a country level changes the international competitiveness of companies and the statement of a balance of trade which again affects the GDP of a country. Stock market prices are also impacted by changes in currency exchange rates, which in turn influences the growth of the financial markets.

Ndunda (2016) posit that the model maintains that variability in exchange rates affect the competitiveness of all the financial markets such as bond and derivative markets as well as equity markets. It the proceeds that appreciation of exchange rates affect exporters negatively which is also likely to affect the quantity of goods and services as it represents the amount of money exchanged at a time in the market. The theory considers macro-economic variables and is therefore of essence in the foregoing study.

2.3 Determinants of Bond Market Performance

This section covers the macroeconomic variables that affect bond market performance, such as interest rates, inflation, currency rates, money supply, and gross capital formation.

2.3.1 Interest Rates

Ouma and Muriu (2014) posit that level of investment for a country depends on the interest rates. People who invest their money would demand compensation either periodically or after a given time. High interest rates can result into a drop in investment activities while low interest rates can spur economic activities. Most investment companies as well as government, use more debt in form of bond to finance their long term economic activities. This therefore demonstrates that there is a relationship between debt financing in form of bond and interest rates in the country.

2.3.2 Inflation Rates

According to Kang and Pflueger (2013), a rise in inflation in an economy raises the cost of living for a majority of consumers in developing nations when unemployment is high. In scenarios where there is an increase in inflation rates, consumers shift their resources from investment in the security market to consumption. The volume of bonds exchanged in the bond market has decreased as a result of a fall in demand for bond security.

2.3.3 Exchange Rates

Longei and Ali (2017) argue that when the exchange rate is stable, it has an impact on the bond market because it influences the country's trade balance and the country's monetary and fiscal policy. According to Ngabirano (2016), foreign currency appreciation is anticipated to increase the liquidity of the secondary bond market. Fluctuations in foreign exchange rates can cause foreign investors to transfer their bond investments back to their home countries.

2.3.4 Money Supply

Musah, Badu-Acquah, and Adjei (2019) demonstrate that an increase in money supply (broad money) may increase investment opportunities in capital markets, especially bonds, provided a high degree of knowledge exists. Broad money is expected to have an effect on the growth of the bond market.

2.3.5 Gross Capital Formation

Gross capital formation is one of the most essential variables in the growth of a nation, according to Rahman and Ahmad (2019). Increasing inflation, according to Choi, Smith and Boyd (1996), exacerbates several financial market frictions. Inflation, on the other hand, interferes with the availability and allocation of investment capital. Capital creation and actual activity will suffer as a result of this meddling.

2.4 Empirical Review

Generally, the relationships between macro-economic factors and bond market performance attributes have been studied globally, regionally and locally. This sections presents the studies identified.

2.4.1 Global Studies

Using data from Beck, Demirguc-Kunt, and Levine (1999), the size of the bond market is positively correlated with GDP per capita. The size of a nation is determined by GDP per capita at purchasing power parity (PPP). Because there are both buyers and sellers in bond markets in developing countries, there is a great deal of price fluctuation. It's because they're so little. The expansion of the bond market is also dependent on the quantity of domestic lending by the banking sector to GDP. Banking institutions compete with bonds for market share, limiting bonds' capacity to generate money.

The underdevelopment of Asian bond markets was examined by Eichengreen and Luengnamemitchai (2004). An in-depth look at local bond markets using multivariate regression analysis shows that the sluggish growth is due to a variety of variables (attributing corruption, bureaucracy, market size, poor accounting standard among others as the contributory factors). Macroeconomic policy in Asia, on the other hand, serves a dual purpose when it comes to substance: (supporting the development of the bond markets and at the same time twisting the development of the markets).

Adelegan and Radzewicz (2009) claim that interest rate increases have a detrimental impact on bond market development because few businesses can afford to repay their loans when interest rates are high. Investment in long-term fixed-rate notes is less appealing to investors when interest rates are variable, since the purchasing power of such assets is at risk. The expansion of the domestic bond market is facilitated by an increase in the flexibility of the exchange rate. As a result of the worldwide rivalry created by pegged exchange rates, local intermediation may be hampered in its efforts to expand. Bond market growth is predicted to be linked to current GDP per capita growth. Investors in underdeveloped nations suffer restrictions on creditor rights, lack of transparency, and weak corporate governance.

2.4.2 Regional Studies

Christensen (2004) studied the domestic loan market in Sub-Saharan Africa in order to get a sense of how deep it is. The study revealed that the African domestic debt markets are small, short-term, and have a limited investor base. As stated in the study, private sector borrowing is essentially stifled due to rising domestic debt levels.

Adelegan and Radzewiczbak examined the evolution of the bond market in 23 SSA countries (2009). Bond market development is positively correlated with nation size, which indicates that the lesser a country's natural openness to outside investment, the greater its potential to build a local bond market through external finance. Sub-Saharan Africa's domestic bond market growth and financial market widening have been hampered by a lack of savings, according to the study's overall conclusion financial intermediation has been limited by these limits, and the research claims that the development of domestic bonds as a sub-segment of the overall financial market has a favorable impact on a country's financial system growth.

Africa's bond market is still in its early stages, according to Mu et al (2013) Balanced budget, wider interest rate spread, more exchange rate volatility, and more open capital accounts were shown to be inversely linked with market capitalization of a government securities market. Stigmatization of local currency bond markets, corporate bonds and government debt are some of the major difficulties facing bond markets in African nations like Nigeria, according to the research.

An investigation by Musah, Badu-Acquah, and Adjei (2019) looked at what factors help to fuel growth in Ghana's bond market. Data were analyzed with the use of the VECM (Vector Error Correction Model). ADF stationarity, Johansen Co-integration, and other tests ensured our results' accuracy. Global bank size, Ghana's economy, foreign debt, and money supply all affect corporate bond market growth. Growth in the economy, the budget deficit, and the size of Ghana's banks all affect the country's government bond market. Size of the banking system, money supply, and other external loans determine much of the market size in Ghana.

Nigeria's bond market evolution was evaluated by Nkwede (2020) on a macroeconomic level. Multiple regression was used to evaluate time series data collected over a 32-year period using standard least square regression methods. The total market capitalization of the bond market, which includes both government and corporate bonds, was taken advantage of. Inflation, currency fluctuation, and interest rate fluctuations are all significant macroeconomic variables that have a negative impact on Nigeria's bond market capitalization, as the study's findings demonstrate.

2.4.3 Local Studies

Based on his findings, Fredrick (2014) studied the impact of macroeconomic factors on Kenya's debt market. It was shown that macroeconomic considerations have a direct effect in shaping the growth of the bond market. According to the results of the research, exports and fiscal policy had minimal influence on bond market development. But the analysis indicated that exchange rates, interest rates and GDP per capita all had a favorable impact. A measure of economic scale, GDP at purchasing power parity, has a negative influence.

Bond market performance in Kenya is directly influenced by macroeconomic factors, according to Mugo (2018). The study used a longitudinal research strategy. Regression findings demonstrated that macroeconomic variables have an impact on bond performance in the long term. According to the VECM, bond performance and macroeconomic conditions are linked in the near term. The currency exchange rate and interest rate have a negative impact on the performance of bond issues. At least in the short run, inflation was positively related to bond performance. For the sake of bond performance, this research proposes keeping an eye on policies on the exchange rate and interest rate. In order to improve bond performance, the research advises a rigorous monetary policy and control over the elements that contribute to the change in the inflation rate.

The performance of NSE corporate bonds was examined by Maina and Kimutai (2018) for the effect of macroeconomic conditions. During the study period, corporate bond returns were negatively correlated with currency exchange rates, interest rates, and inflation. Using multiple linear regression, currency, inflation, and commercial bank interest rates all negatively impact

corporate bond performance. The performance of corporate bonds was significantly linked to the amount of governmental expenditure. Investing in government bonds has a favorable correlation with their performance.

Macroeconomic factors were examined by Kamenju (2018) to see how they affected the development of Kenya's bond market. As interest rates rose and inflation fell, the bond market's volatility increased, according to a regression analysis. In contrast, the expansion of the bond market was inversely proportional to the size of a country's economy. Large bank size, exports, and fiscal policy had no significant impact on bond market expansion.

Table 2.1: Summary of Literature Review and Knowledge Gaps

Author	Focus of Study	Methodology	Findings	Research Gaps
Beck et al. (1999)	Relationship between level of GDP and bond market size	Regression Analysis	Growth of the bond market is largely dependent on the size of the banking sector.	Identify effect of size on performance
Eichengreen and Luengnamemitchai (2004)	Factors that have impeded the growth of the Asian bond market.	Multivariate Regression Analysis	Macroeconomic policy in Asia supports the growth of bond markets while at the same time distorting the growth of the markets.	Need to distinguish factors that positively influence performance from the negative ones
Adelegan and Radzewicz (2009)	Selected macro-economic variables and bond market development	Regression Analysis	Too high interest rates have a detrimental impact on the development and issuance of the bond market. In countries where currency rates are more flexible, a local bond market is likely to develop. The growth of the bond market correlates positively with GDP.	Determine the impact of macroeconomic variables on performance.
Christensen (2004)	Reviewing the depth of African bond markets	Desktop review	These markets are small, short-term and have a limited investor base in African countries.	Study the underlying macroeconomic determinants of depth
Adelegan and Radzewicz (2009)	The factors affecting Sub-Saharan Africa's bond market growth.	Multivariate Regression Analysis	The size of a nation has a positive correlation with the development of the bond market. The absence of savings has stifled the expansion of the domestic bond market.	Study the underlying macroeconomic determinants of performance
Mu et al (2013)	Nature of bond markets in Africa	Econometric model	Higher market value for government assets is directly linked to improved institutions and reduced interest rate volatility. Government securities market	Study the relationship between the macroeconomic determinants and performance of both

			capitalization is adversely correlated with financial stability, wider interest rate spreads, exchange rate volatility, and capital account openness.	corporate and government bond markets
Author	Focus of Study	Methodology	Findings	Research Gaps
Musah, et al. (2019)	Factors that encourage the growth of the Ghanaian bond market.	Vector Error Correction Model (VECM)	Growth in the corporate bond market depends on the size of a country's banks, foreign debt, money supply and economy. The size of Ghana's government bond market is impacted by the country's economic success, budget deficit, and bank size.	Model the link between macroeconomic factors and the performance of both corporate and government bond markets.
Nkwede (2020)	Macroeconomic determinants of bond market growth in Nigeria	Multivariate Regression Analysis	An increasing demand for bonds in a nation is dependent on the size of its banks and the amount of money it has available. A country's economic growth, budget deficit, and bank size all affect the size of Ghana's government bond market.	Study how other macroeconomic variables relate with bond market performance
Fredrick (2014)	The impact of macroeconomic conditions on Kenya's bond market.	Multivariate Regression Analysis	Large bank size, exports, and fiscal policy had no significant impact on bond market expansion. Economic growth, inflation, and GDP per capita all had a positive impact on the interest rate. Size of the economy and inflationary pressures hurt the economy	Model the relationship between lagged macroeconomic drivers and bond markets performance
Mugo (2018)	The impact of macroeconomic variables on Kenya's bond market performance	Vector Error Correction Model (VECM)	Currency and interest rate movements have a negative impact on the performance of the bond market. High inflation has a beneficial impact on bond market returns.	Model the relationship between lagged macroeconomic drivers and bond markets performance
Maina and	Corporate bond performance at	Multiple linear	Companies' bond performance suffers	Model the relationship

Kimutai (2018)	the NSE is affected by macroeconomic conditions.	regression	when exchange rates, inflation rates, and interest rates at commercial banks fluctuate negatively. Corporate bond performance is positively correlated with government expenditure.	between lagged macroeconomic drivers and bond markets performance
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2.5 Conceptual Framework

As presented in the figure below, the dependent variable in the study (bond market performance) is influenced by predictor variables derived from the literature specifically interest rates by Ouma and Muriu (2014), inflation rates by Kang and Pflueger (2013), exchange rates by Longei and Ali (2017) and Ngabirano (2016), money supply by Musah, Badu-Acquah and Adjei (2019) and gross capital formation by Rahman and Ahmad (2019) and Choi, Smith and Boyd (1996).

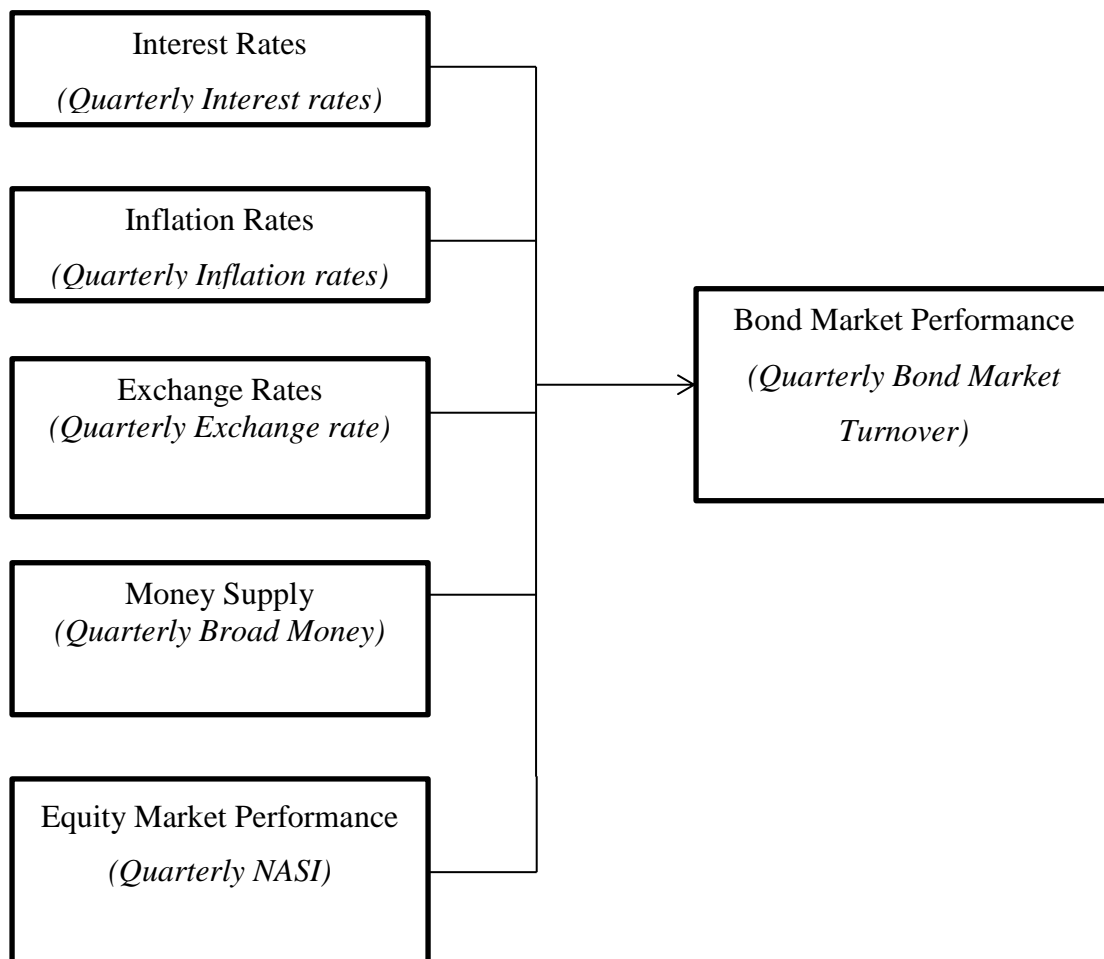


Figure 2.1: Conceptual Framework

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed overview of how the research was to be carried out. It includes the study's research design, the study's intended audience, the sampling strategy and sample size, as well as the processes and techniques used to collect data throughout the investigation. Also included are diagnostic tests, the empirical model used, and the presentation of the results.

3.2 Research Design

A research design is a strategy for addressing questions (Orodho, 2003). Alternatively, a broad method or plan for studying particular testable research issues might be adopted (Lavrakas, 2008). The investigation was carried out with the aid of a quantitative strategy. Quantitative research's purpose is to give more information about a study subject by connecting the variables being examined, according to Mugenda & Mugenda (2003). Quantitative research may be divided into longitudinal and cross-sectional surveys according to Bryman and Bell (2007). A longitudinal survey was used in this investigation. The goal of a longitudinal survey is to gather information about a given condition across time by conducting a series of surveys. Macroeconomic variables that affect bond market performance were investigated over a period of 10 years in this study.

3.3 Data Collection

Previously, secondary data was collected as part of the research. Throughout the study, the researcher gathered data on a quarterly cycle. Kenya's National Bureau of Statistics (KNBS), Nairobi Securities Exchange (NSE), and Central Bank of Kenya (CBK) annual reports were utilized for secondary data collecting in this research (KNBS). From 2015 through 2020, data was collected on bond market turnover, interest rates and inflation, the exchange rate, the money supply and the stock market index.

3.4 Data Analysis

The data were analyzed using descriptive and inferential statistics. The data were examined using mean, standard deviation, frequency, and percentages. The data was examined via the use of regression analyses in both SPSS and E-Views. The overall regression model was as follows:

$$BP_t = \beta_0 + \beta_1 IR_t + \beta_2 IL_t + \beta_3 ER_t + \beta_4 MS_t + \beta_5 GCF_t + \beta_6 EQMP_t + \varepsilon_t \dots \dots \dots (i)$$

Where;

BP_t = Quarterly Bond market performance index in period t

IR_t = Interest rate measured as quarterly interest rate in period t

IL_t = Inflation rate measured as quarterly inflation rate in Period t

ER_t = Exchange rate measured as quarterly exchange rate in period t

MS_t = Money supply measured as quarterly M2/GDP in period t

$EQMP_t$ = Quarterly Equity market performance index in period t

β_0 = Constant, β_1 - β_5 = Regression coefficient of the independent variables.

3.4.1 Model Specification

Macroeconomic factors and bond market performance components were tested using a distributed lag model with explanatory variables that included explanatory variables with lagged values of independent variables. There are many previous values of the explanatory variable, x, that impact the dependent variable in a distributed lag model. For each macroeconomic variable, the model was;

$$BP_t = \beta_0 + \beta_1 MEV_t + \beta_2 MEV_{t-1} + \dots + \beta_q MEV_{t-q} + \varepsilon_t \dots \dots \dots (ii)$$

Where BP_t is the Bond market performance index at time t

MEV is macroeconomic variable

ε is the error term

q is the maximum lag

t is the time period

Using lagged values as an explanatory variable in most economic connections since economic activity is affected by the previous values' behavior and patterns. Lag lengths were selected using a Likelihood Ratio (LR) test.

3.4.2 Diagnostic Tests

To determine whether the model is significant, diagnostic tests were performed. Multicollinearity, normalcy, and heteroskedasticity were all tested. Multicollinearity was evaluated to see whether there are any free components that are linked together. When working with time series data, researchers are more likely to encounter multicollinearity. Multicollinearity was determined using the variance inflation factor (VIF). Over 10 indicates a problem with multicollinearity, but VIF values below 10 suggest no problems.

The model was subjected to a normality test. When looking for anomalies in the data, normality testing is used. It is expected that data in a linear regression are regularly distributed. There are several things that should have been included in the study but were assumed by the researcher in the model development. Errors in OLS must be distributed in a natural way. Testing for normalcy was performed using the Shapiro–Wilk test.

The heteroscedasticity test was used to examine whether the error term was consistent across all of the data. If all of the residuals come from a population with a constant variance, then there will be heteroscedasticity. Breusch–white Pagan's tests were used to determine whether a variable's variance across sample units was continuous in a regression model. There are no issues with heteroscedasticity if the p-value is more than 0.05, but there are issues with heteroscedasticity that need to be addressed if the p-value is less than 0.05. Corrected standard errors were then applied to remedy the problem.

3.4.3 Test of Significance

The model and variables were put to the test using an ANOVA. Analysis of Variance (ANOVA) employed F-stats and p values to examine the model's ability to fit the data.

CHAPTER FOUR
DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter summarizes the key conclusions from the preceding chapter's data analysis. It incorporates quantitative data analysis and correlation analysis to discover the study's variables' relationships. Tables are used to present the findings. A discussion of the finding is then presented, which summarizes the main study findings.

4.2 Descriptive Statistics

Table 4.1 shows that the average turnover for the period is Kshs, 128,314,830,000, with the minimum turnover of Kshs. 44,511,000,000 and the maximum turnover of Kshs. 227,862,000,000 with a standard deviation of Kshs. 44,914,320,000. The average equity market index is 3,233.0817 as the minimum index is 1,759.90 and the maximum index is 5,346.00 with a standard deviation of 925.629.

Table 4.1: Study Variables Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
1. Bond Turnover (Ksh Millions)	24	44,511.0	227,862.0	128,314.83	44,914.32
2. Interest rate	24	11.75	18.15	13.8342	1.91321
3. Inflation rate	24	4.00	10.80	6.0917	1.55064
4. Exchange rate	24	91.53	109.49	102.1371	3.46652
5. Money supply	24	971.89	1720.10	1357.7778	227.31718
6. Equity market performance index	24	1759.90	5346.00	3233.0817	925.62953
Valid N (listwise)	24				

Average interest rate is 13.83 percent with a standard deviation of 1.91 in table 4.1 above, where the minimum interest rate is 11.75 percent and the highest interest rate is 18.15 percent. The average inflation rate is 6.09 percent, with a standard deviation of 1.55 percent, with a minimum inflation rate of 4 percent and a maximum inflation rate of 10.80 percent. The average Usd/ Ksh exchange rate is 102.12 as the minimum Usd/ Ksh exchange rate is 91.53 and the maximum Usd/ Ksh. Exchange rate is 109.49 with a standard deviation of 3.466. Money supply for the period

was on average 1357.77 with a minimum of 971.89 and a maximum of 1720.10 with a standard deviation of 227.317.

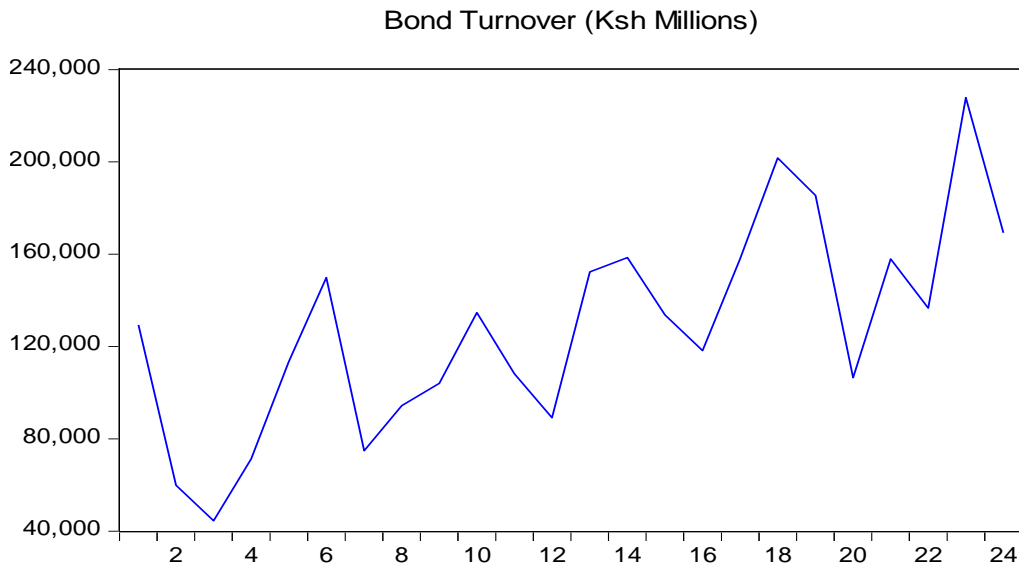


Figure 4.1: Bond Market Turnover

As presented in Figure 4.1 above, the bond market turnover in Kenya exhibits swings as there is no consistent trend of increase or decrease over the quarters. The minimum bond market turnover is Kshs. 44,511,000,000 and the maximum bond market turnover is Kshs. 227,862,000,000.

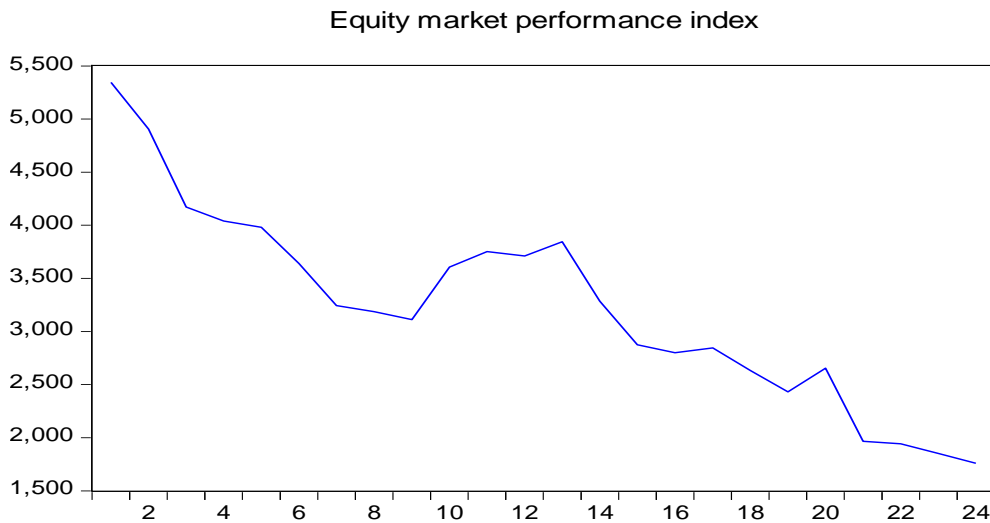


Figure 4.2: Equity Market Index

Figure 4.2 above shows that there has been a downward trend in the performance of the equity market index over the quarters and the years as the minimum index is 1,759.90 and the maximum index is 5,346.00.

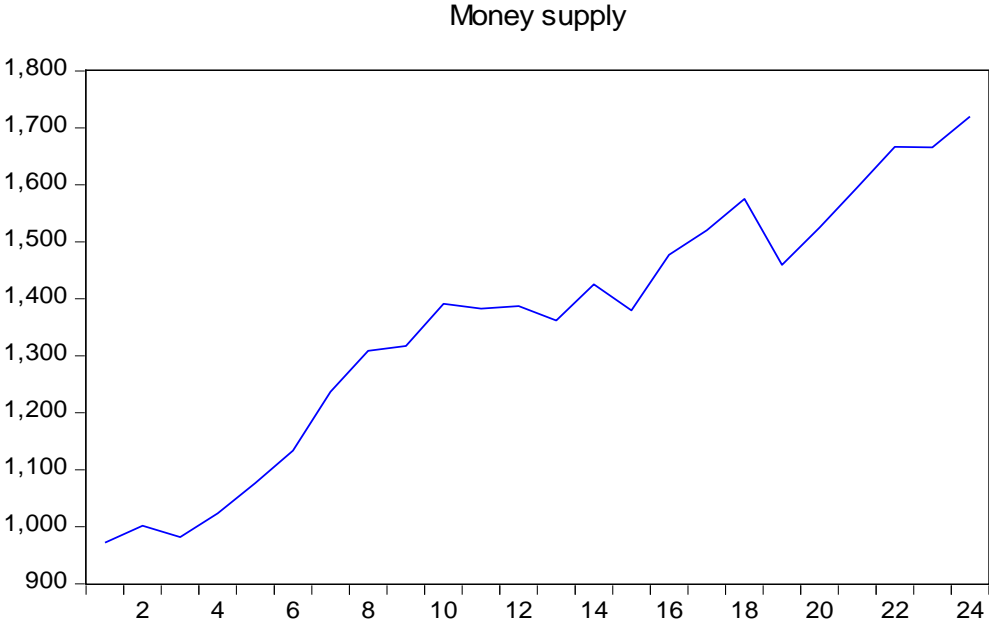


Figure 4.3: Money Supply

Figure 4.3 above shows that there has been an upward trend in the money supply over the quarters and the years as the minimum money supply is 971.89 and the maximum money supply is 1720.10. Figure 4.4 below shows that over the quarters and years, the exchange rate has risen from the initial Usd/ Ksh exchange rate of 91.53 to the maximum Usd/ Ksh exchange rate of 109.49. Between Quarter four and Quarter twenty one, the rate kept fluctuating slightly above the Usd/ Ksh 100 range.

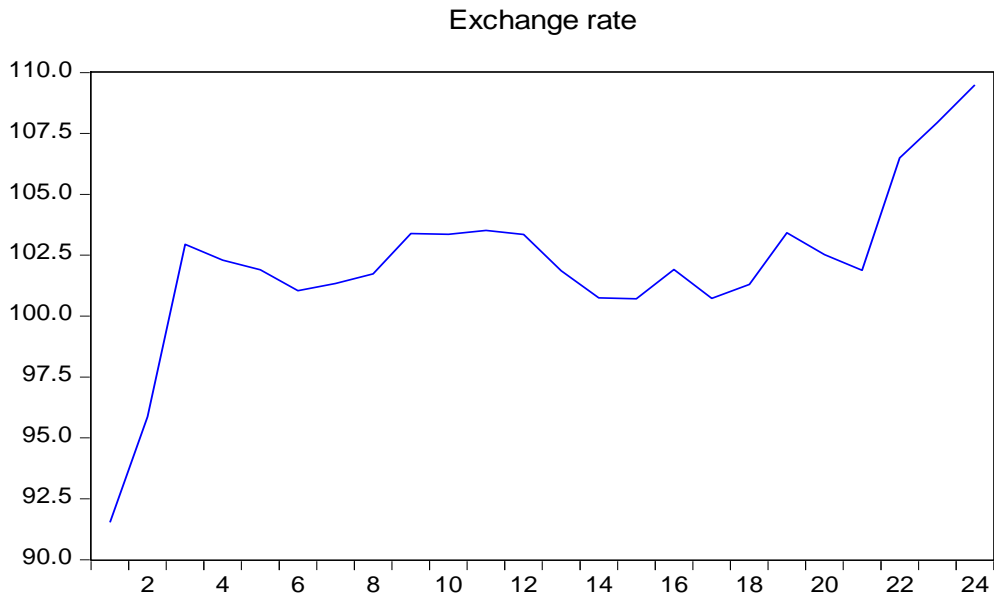


Figure 4.4: Exchange Rate

A declining trend in the economy's average interest rates may be seen in Figure 4.5 below, with the lowest interest rate standing at 11.75 percent and the highest at 18.15 percent.

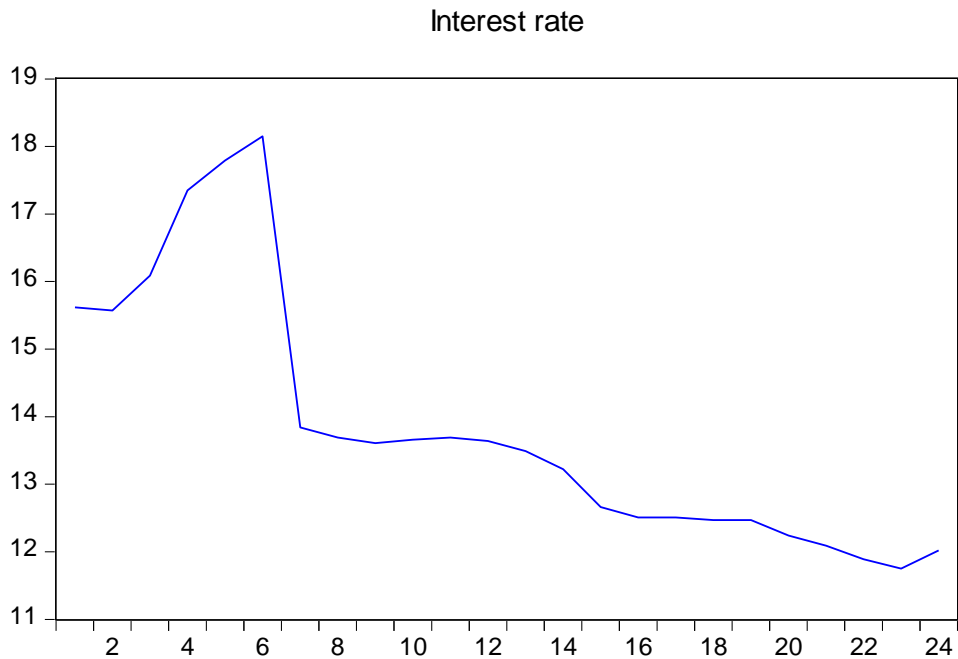


Figure 4.5: Interest Rate

Figure 4.6 below shows that there have been fluctuations in inflation rate over the quarters and the years without a predictable trend as the minimum inflation is at 4.00% and the maximum inflation rate is at 10.80%.

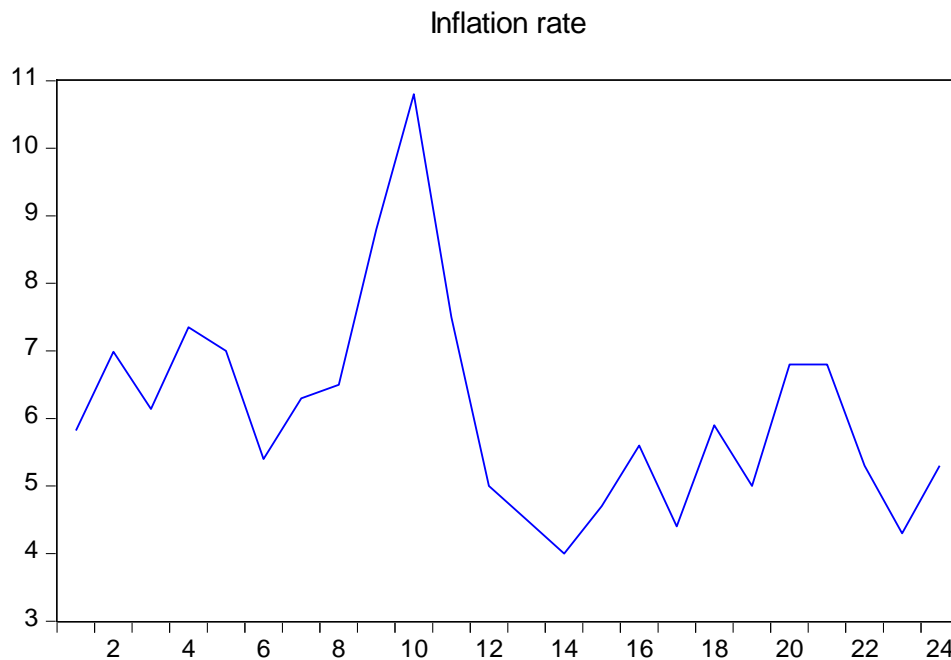


Figure 4.6: Inflation Rate

4.3 Diagnostic Tests

This involved testing for multicollinearity, normality and heteroscedasticity of the data that is used in the current study.

4.3.1 Multicollinearity Tests

Multicollinearity was investigated in the research to see whether the free variables of the study variables were linked. When working with time series data, multicollinearity is often encountered. Multicollinearity was determined using the variance inflation factor (VIF). Over 10 indicates a problem with multicollinearity, but VIF values below 10 suggest no problems.

Table 4.2: Multicollinearity Variance Inflation Factors

Model		Collinearity Statistics	
		Tolerance	VIF
1	Interest rate	.168	5.946
	Inflation rate	.864	1.157
	Exchange rate	.373	2.681
	Money supply	.094	9.678
	Equity market performance index	.182	5.500

a. Dependent Variable: Bond Turnover (Ksh Millions)

As evidenced in Table 4.2 above, all the variables returned $VIF < 10$ inferring that Multicollinearity does not exist. Specifically, interest rate $VIF = 5.946$, Inflation rate $VIF = 1.157$, Exchange rate $VIF = 2.681$, Money Supply $VIF = 9.678$ and Equity market Index $VIF = 5.500$.

4.3.2 Normality Tests

Table 4.3 shows the results of the model's normality test. In a linear regression, it is expected that the data are regularly distributed, hence normality testing is included while looking for anomalies in the data.

Table 4.3: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Bond Turnover (Ksh Millions)	.118	24	.200*	.959	24	.411
Interest rate	.249	24	.000	.849	24	.002
Inflation rate	.112	24	.200*	.912	24	.039
Exchange rate	.264	24	.000	.838	24	.001
Money supply	.164	24	.092	.917	24	.049
Equity market performance index	.110	24	.200*	.962	24	.472

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The Shapiro–Wilk and the Klomorogov Smirnov test used to test for the normality in the study shows that data on Bond turnover ($P > 0.05$), Inflation rate ($P > 0.05$), Money Supply ($P > 0.05$) and Equity market index ($P > 0.05$) are normally distributed while the data on Interest rate ($P < 0.05$) and Exchange rate ($P < 0.05$) are not normally distributed.

4.3.3 Heteroscedasticity Tests

Data heteroscedasticity or whether the error component was constant across observations was determined using the Breusch–Pagan test. Heteroscedasticity is an issue in regression since it presupposes that all residuals are obtained from a constant variance population. As shown in Table 4.4 below, when the p-value is more than 0.05, heteroscedasticity is not a concern; but, when the p-value is less than 0.05, there are heteroscedasticity-related issues that should be addressed. Because the p value of the research variables is more than 0.05, there is no evidence of heteroskedasticity for the study variables.

Table 4.4: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.601905	Prob. F(5,18)	0.6992
Obs*R-squared	3.437897	Prob. Chi-Square(5)	0.6328
Scaled explained SS	1.162608	Prob. Chi-Square(5)	0.9484

4.4 Correlation Analysis

Table 4.5 below presents the Correlation relationships between the study variables. As presented in the table, there is a statistically significant strong negative relationship between interest rate and bond market turnover ($r = -0.512$), a weak negative relationship between inflation rate and bond market turnover ($r = -0.356$), a weak positive relationship between exchange rate and bond market turnover ($r = 0.255$), a statistically significant strong positive relationship between money supply and bond market turnover ($r = 0.697$) and a statistically significant weak negative relationship between Equity market performance index and Bond market turnover ($r = -0.603$).

Table 4.5: Correlation Matrix

	Bond Turnover (Ksh Millions)	Interest rate	Inflation rate	Exchange rate	Money supply	Equity market performance index	
Bond Turnover (Ksh Millions)	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	24					
Interest rate	Pearson Correlation	-.512*	1				
	Sig. (2-tailed)	.011					
	N	24	24				
Inflation rate	Pearson Correlation	-.356	.252	1			
	Sig. (2-tailed)	.087	.235				
	N	24	24	24			
Exchange rate	Pearson Correlation	.255	-.415*	-.040	1		
	Sig. (2-tailed)	.229	.044	.854			
	N	24	24	24	24		
Money supply	Pearson Correlation	.697**	-.888**	-.259	.644**	1	
	Sig. (2-tailed)	.000	.000	.221	.001		
	N	24	24	24	24	24	
Equity market performance index	Pearson Correlation	-.603**	.747**	.281	-.717**	-.877**	1
	Sig. (2-tailed)	.002	.000	.184	.000	.000	
	N	24	24	24	24	24	24

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

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

In table 4.5 above, a statistically significant strong negative relationship is presented between equity market performance index and exchange rate ($r=-0.717$), a statistically significant negative relationship is established between equity market performance index and money supply ($r=-0.877$), a weak positive relationship is presented between equity market performance index and inflation rate and a strong positive relationship is presented between equity market performance index and interest rates ($r=0.747$).

There is a weak but statistically significant correlation between inflation and interest rates in table 4.5 above ($r=0.252$), a weak but statistically significant correlation between exchange rate ($r=-0.415$), and a large but statistically significant correlation between money supply ($r=-0.888$). The correlation coefficient of $r=0.644$ indicates a strong relationship between the money supply and the exchange rate. Between inflation and the exchange rate, there is a minor negative connection ($r=-0.040$), as well as a weak negative correlation between money supply and inflation ($r=-0.259$).

4.5 Regression Analysis

Table 4.6 shows that macroeconomic variables account for 64.6 percent of Bond market turnover volatility (Adjusted $R^2 = 0.646$).

Table 4.6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.850 ^a	.723	.646	.23295

a. Predictors: (Constant), Equity market performance index, Inflation rate, Exchange rate, Interest rate , Money supply

In table 4.7 below, the analytical model presenting the relationships between bond market turnover and the macro economic variables is statistically significant ($F=9.399$, $p < 0.05$).

Table 4.7: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.550	5	.510	9.399	.000 ^b
	Residual	.977	18	.054		
	Total	3.527	23			

a. Dependent Variable: Bond Turnover (Ksh Millions)

b. Predictors: (Constant), Equity market performance index, Inflation rate, Exchange rate, Interest rate, Money supply

The regression coefficients in Table 4.8 indicate that interest rates and bond market turnover have a statistically significant positive association ($\beta=0.943$, $p < 0.05$), implying that a unit rise in interest rates results in an increase in bond market turnover of up to 0.943 units. Additionally, there is a statistically significant positive association between money supply and bond market development ($\beta=1.714$, $p < 0.05$), meaning that increasing money supply by a unit results in an increase in bond market development of up to 1.714 units.

Table 4.8: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16.197	12.702		1.275	.218
	Interest rate	.193	.062	.943	3.118	.006
	Inflation rate	-.029	.034	-.114	-.857	.403
	Exchange rate	-6.964	2.305	-.613	-3.021	.007
	Money supply	3.814	.902	1.714	4.228	.001
	Equity market performance index	-.278	.382	-.212	-.728	.476

a. Dependent Variable: Bond Turnover (Ksh Millions)

As shown in Table 4.8, the negative association between exchange rates and bond market market development is statistically significant ($\beta=-0.613$, $p < 0.05$), meaning that a one-unit rise in exchange rates results in a 0.613-unit drop in bond market turnover. The negative link between inflation and bond market development is not statistically significant ($\beta=-0.114$, $p > 0.05$), implying that a unit rise in inflation results in a fall of up to 0.114 units in bond market development.

Table 4.9: Pairwise Granger Causality Tests

Date: 11/14/21 Time: 15:46

Sample: 1 24

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EQUITY_MARKET_PERFORMANC does not Granger Cause BOND_TURNOVER__KSH_MILLI	22	5.36933	0.0156
BOND_TURNOVER__KSH_MILLI does not Granger Cause EQUITY_MARKET_PERFORMANC		0.62041	0.5495
EXCHANGE_RATE does not Granger Cause BOND_TURNOVER__KSH_MILLI	22	2.63850	0.1005
BOND_TURNOVER__KSH_MILLI does not Granger Cause EXCHANGE_RATE		1.69223	0.2137
INFLATION_RATE does not Granger Cause BOND_TURNOVER__KSH_MILLI	22	0.45516	0.6419
BOND_TURNOVER__KSH_MILLI does not Granger Cause INFLATION_RATE		0.61270	0.5534
INTEREST_RATE does not Granger Cause BOND_TURNOVER__KSH_MILLI	22	3.54389	0.0517
BOND_TURNOVER__KSH_MILLI does not Granger Cause INTEREST_RATE		8.39769	0.0029
MONEY_SUPPLY does not Granger Cause BOND_TURNOVER__KSH_MILLI	22	8.68605	0.0025
BOND_TURNOVER__KSH_MILLI does not Granger Cause MONEY_SUPPLY		0.25399	0.7786
EXCHANGE_RATE does not Granger Cause EQUITY_MARKET_PERFORMANC	22	1.79694	0.1959
EQUITY_MARKET_PERFORMANC does not Granger Cause EXCHANGE_RATE		4.35122	0.0298
INFLATION_RATE does not Granger Cause EQUITY_MARKET_PERFORMANC	22	2.26610	0.1341
EQUITY_MARKET_PERFORMANC does not Granger Cause INFLATION_RATE		0.10062	0.9048
INTEREST_RATE does not Granger Cause EQUITY_MARKET_PERFORMANC	22	0.01137	0.9887
EQUITY_MARKET_PERFORMANC does not Granger Cause INTEREST_RATE		1.24538	0.3128
MONEY_SUPPLY does not Granger Cause EQUITY_MARKET_PERFORMANC	22	0.57259	0.5746
EQUITY_MARKET_PERFORMANC does not Granger Cause MONEY_SUPPLY		2.82261	0.0874
INFLATION_RATE does not Granger Cause EXCHANGE_RATE	22	0.08549	0.9185

EXCHANGE_RATE does not Granger Cause INFLATION_RATE		0.38867	0.6838
INTEREST_RATE does not Granger Cause EXCHANGE_RATE	22	1.16124	0.3367
EXCHANGE_RATE does not Granger Cause INTEREST_RATE		1.90257	0.1796
MONEY_SUPPLY does not Granger Cause EXCHANGE_RATE	22	2.50087	0.1117
EXCHANGE_RATE does not Granger Cause MONEY_SUPPLY		1.85329	0.1870
INTEREST_RATE does not Granger Cause INFLATION_RATE	22	0.19078	0.8281
INFLATION_RATE does not Granger Cause INTEREST_RATE		0.83915	0.4492
MONEY_SUPPLY does not Granger Cause INFLATION_RATE	22	1.42823	0.2671
INFLATION_RATE does not Granger Cause MONEY_SUPPLY		0.07476	0.9283
MONEY_SUPPLY does not Granger Cause INTEREST_RATE	22	7.68671	0.0042
INTEREST_RATE does not Granger Cause MONEY_SUPPLY		1.66005	0.2195

In table 4.8 above, the negative relationship between equity market performance index and bond market development is not statistically significant ($\beta=-0.212$, $p > 0.05$) implying that a unit increase in equity market performance index leads to a decline in bond market turnover by up to 0.212 units. The following regression equation was therefore estimated:

$$BP_t = 16.197 + 0.943IR_t - 0.114IL_t - 0.613ER_t + 1.714MS_t - 0.212EQMP_t + \varepsilon$$

Where;

BP_t = Quarterly Bond market performance index in period t

IR_t = Interest rate measured as quarterly interest rate in period t

IL_t = Inflation rate measured as quarterly inflation rate in Period t

ER_t = Exchange rate measured as quarterly exchange rate in period t

MS_t = Money supply measured as quarterly M2/GDP in period t

$EQMP_t$ = Quarterly Equity market performance index in period t

β_0 = Constant, β_1 - β_5 = Regression coefficient of the independent variables.

4.6 Dual Causality Tests

Granger Causality between the study variables was tested and the findings are presented in table 4.9 above. As presented, equity market performance exhibits dual causality relationships with the bond market performance ($p < 0.05$), Bond market performance has dual causality with interest rates ($p < 0.05$), equity market performance exhibit dual causality with exchange rates ($p < 0.05$), money supply exhibits dual causality with bond turnover ($p < 0.05$) and money supply exhibits dual causality with interest rates ($p < 0.05$).

4.7 Interpretation and Discussion of Findings

Coefficients and their signs are critical to this research since they represent the model's determinants' strengths. There is a positive correlation between the interest rate, the money supply, and the exchange rate on bond market turnover, whereas the latter has a negative correlation. Inflation and equity market development have little effect on bond and stock market growth.

However, Adelegan and Radzewicz (2009) and Mu et al. (2013) revealed that market capitalization of government securities is favorably associated to better institutions and interest rate volatility, but inversely associated to company size. Bank size and exports have little influence on bond market growth, according to Fredrick (2014).

The number of banks, foreign debt, money supply, and economy all influence corporate bond market growth (Musah and Badu-Acquah and Adjei, 2019). Here's another to bolster their case. The exchange rate has a detrimental influence on the Nigerian bond market capitalisation and bond performance, according to Nkwede (2020) and Mugo (2018). Exchange rates have been shown to have a detrimental impact on the performance of corporate bonds, as illustrated by Maina and Kimutai (2018).

Inflation reduces corporate bond returns, according to Maina and Kimutai (2018), which matches our findings. Mugo (2018) found a link between inflation and bond performance, while Kamenju (2018) found a link between inflation and bond market growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In chapter five, findings and suggestions are provided in line with the study's goals. Chapter four's findings and analysis, as well as its relationship to the literature discussed in Chapter 2, provide the basis for the summary and conclusion.

5.2 Summary of Findings

Investing possibilities for both local and international investors, as well as funding the government's budget deficit, are critical components of Kenya's bond market growth. Macroeconomic, industry-level, market-level, and firm-level effects are only some of the many factors that may impact the bond market. A stable macroeconomic environment is the key to a healthy bond market. This assumption necessitates an examination of macroeconomic factors and their influence on Kenya's bond market performance.

The purpose of this research was to examine how Kenya's bond market's performance is influenced by macroeconomic factors. According to the report, the impact of interest rates, inflation rates, and foreign currency rates on Kenya's bond market performance was examined in detail. On Kenya's bond market and stock market performance, the influence of the country's money supply.

Bond market turnover and money supply growth have been determined to have statistically significant positive relationships, according to the study. The relationship between the exchange rate and the growth of the bond market is statistically negative. Inflation and bond market growth have no statistically significant relationship. It has also been demonstrated that the correlation between the equities performance index and the growth of the bond market is not statistically significant.

On dual causality, equity market performance exhibits dual causality relationships with the bond market performance, Bond market performance has dual causality with interest rates, equity

market performance exhibit dual causality with exchange rates, money supply exhibits dual causality with bond market turnover and money supply exhibits dual causality with interest rates.

5.3 Conclusions

According to the findings, macroeconomic variables account for 64.6% of the changes in bond market turnover, while other factors account for 35.4%. Interest rates and bond market turnover were shown to have statistically significant positive correlations with the money supply and bond market development. In this analysis, there is a statistically significant correlation between the exchange rate and the growth of the bond market. The negative association between inflation and bond market development isn't statistically significant.

As expected among macro-economic variables, the study concludes that dual causality relationships exist between equity market performance and bond market performance, bond market performance and interest rates, equity market performance and exchange rates, money supply and bond market turnover as well as money supply and interest rates.

5.4 Recommendations

Given that the interest rate levels significantly effect the bond market performance, it is hereby recommended that the Government and Regulatory agencies should strengthen the interest rate regulatory framework so as to infuse economic development in diverse sectors of the Kenyan economy. The money supply as a responsibility of the central bank should be modelled to encourage private borrowing, bond market development and credit creation.

Economic planners are urged to be proactive in controlling macro-economic issues in the economy that impede bond market growth. As inflation rises and the value of the currency increases, the performance of corporate bonds suffers. In order to prevent the economy from being overtaken by inflation, the government and its fiscal agents must monitor the monetary policy on a regular basis.

5.5 Study Limitations

The research focused on macroeconomic conditions and the performance of Kenya's bond markets throughout the period from 2015 to 2020. As a result, the results may vary from those of other studies conducted at a later date and in a different country. A further limitation of the research was due to its impreciseness.

The study applied a linear regression analysis with a presupposition that bond market performance relate with the macro economic variables in a linear manner. The presumptions may have influence on the findings and interpretations as some literature allude to existence of curvilinear and cyclic relationships.

5.6 Recommendations for Further Research

Another study with diverse lagged macro-economic factors and performance of bond markets in a regional context is hereby advised using robust techniques for longer study duration. To put it simply, a research like this will reveal how macroeconomic factors affect the stock market in both the short and long terms.

There are still a lot of unexplored regions in the bond market, notwithstanding the findings of this research. Besides macroeconomic considerations, future research should investigate industry and business level factors that affect corporate bond market performance. Firm-level research may compare bonds from various companies and identify the major elements that explain such differences.

Further investigation can be done on the causes and effects of bond market failure in an economy. Other emerging regions, such as East Africa, may be included in a research to help these nations adopt effective strategies in growing their bond markets.

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APPENDIX ONE: DATA COLLECTION SHEET

Year	Qtr	Bond market performance index	Equity market performance index	Interest rate	Inflation rate	Exchange rate	Money supply
2010	1						
	2						
	3						
	4						
2011	1						
	2						
	3						
	4						
2012	1						
	2						
	3						
	4						
2013	1						
	2						
	3						
	4						
2014	1						
	2						
	3						
	4						
2015	1						
	2						
	3						
	4						
Year	Qtr	Bond market	Equity market	Interest	Inflation	Exchange	Money supply

		performance index	performance index	rate	rate	rate	
2016	1						
	2						
	3						
	4						
2017	1						
	2						
	3						
	4						
2018	1						
	2						
	3						
	4						
2019	1						
	2						
	3						
	4						
2020	1						
	2						
	3						
	4						

Year	Quarter	Bond Turnover (Ksh Millions)	Interest rate	Inflation rate	Exchange rate	Money supply	Equity Market Performance Index
2015	1	129,370	15.62	5.82	91.53	971.893	5,346
	2	59,897	15.57	6.99	95.87	1001.714	4,906
	3	44,511	16.09	6.14	102.95	982	4,173
	4	71,321	17.35	7.35	102.3	1,023.70	4040
2016	1	113,400	17.79	7	101.9	1,076.77	3982
	2	149,809	18.15	5.4	101.04	1,133.71	3640.6
	3	74,809	13.84	6.3	101.34	1,236.72	3243.2
	4	94,367	13.69	6.5	101.73	1,308.93	3186
2017	1	103,997	13.61	8.8	103.39	1317.2	3112.5
	2	134,633	13.66	10.8	103.36	1391.3	3,607.18
	3	108,168	13.69	7.5	103.52	1382.7	3,751.46
	4	89,120	13.64	5	103.35	1387.1	3,711.94
2018	1	152,338	13.49	4.5	101.86	1362	3,845.34
	2	158,523	13.22	4	100.75	1425.6	3,285.73
	3	133,683	12.66	4.7	100.71	1379.5	2,875.51
	4	118,171	12.51	5.6	101.91	1477.5	2,801.00
2019	1	158,069	12.51	4.4	100.73	1520.3	2846.4
	2	201,715	12.47	5.9	101.3	1575.5	2633.3
	3	185,440	12.47	5	103.42	1,459.73	2432
	4	106,458	12.24	6.8	102.52	1525.2	2654.4
2020	1	157,985	12.09	6.8	101.88	1595.1	1966.1
	2	136,651	11.89	5.3	106.5	1666.6	1942.1
	3	227,862	11.75	4.3	107.94	1665.8	1852.3
	4	169,259	12.02	5.3	109.49	1720.1	1759.9