

Effect of Inflation Rate on Aggregate Bond Performance in Nairobi Securities Exchange in Kenya

Nancy W Kariuki¹, Dr. Assumptah Kagiri²

College of Human Resource Development, Jomo Kenyatta University of Agriculture and Technology

Abstract: The study examined the effects of inflation rate on aggregate bond performance in Nairobi securities exchange in Kenya. The study adopted a descriptive research design. The population being all age of the bond in Kenya. The population also comprised of all finance manager of corporations with bond issued in Kenya. The sample size entailed bond trading in NSE between 2011 to 2015 with a tenor of 1 to 5years. The primary data was collected through questionnaires to the staff in these listed companies. Secondary data was obtained from company financials statements, CMA, NSE, KNBS and CBK data. Data was analysed using multiple linear regression model and the results and findings shows that the macroeconomic indicators have effects on aggregated bond performance. Inflation rate was found to positively affect the aggregate bond performance in Nairobi Securities Exchange in Kenya. The study therefore concluded that inflation rates significantly affect the aggregate bond performance. This will then have a significant impact on the bond performance traded in NSE thusand eventually improve economic growth.

Keywords: Inflation Rate, Aggregate Bond, Performance, Securities Exchange.

1. INTRODUCTION

The capital markets play important roles in the economy growth of the market. The role of public debt in promoting economic growth in Kenya has been the subject of much debate among economists, development specialists and researchers. Bonds market is an alternative vehicle for mobilizing finance for both the government and the private sector in financing long term projects such as housing and infrastructure development, in addition to financing government deficit. Kibua et al., (2005), allude that over the years, bond markets in developing and emerging markets have been growing steadily. The East African bond market is dominated by treasury bonds and is significantly underdeveloped. Kenyan bond market is the largest and most developed as compared to other East Africa Community (EAC) member countries. Beyond the EAC, financial markets in the Sub Saharan Africa (SSA) countries are shallow, and have inadequate access to finance, (Adelegan and Radzewicz-Bak, 2009). According to emerging markets committee of the international organization of securities commissions, emerging bond markets comprised of 11% of global bond markets, which totaled over USD55 trillion as at 2007. By 2030, this is projected to rise to just over 30%, and by 2050 to nearly 40% of the total global bond markets. During the last decade, Kenya has changed rapidly in the range of sophistication of market, intermediaries and product range, (Ngugi & Agoti, 2007). Demand for bonds and bank loans triggers the flow of capital in the market. By the end of 2014, ratio of corporate bond market capitalization to GDP stood at 2% and ratio of corporate bond market turnover to total bond market capitalization stood at 0.1%. This is contrasted by the ratio of equity market capitalization to GDP which stood at 50% in the same period, (CMA, 2014). Bond market capitalization is the number of outstanding bond multiplied by its bond price. Hawkins, (2002) emphasizes that the bond market can lead to a healthier banking system by improving market discipline, and that bond issuance can help central banks and companies achieve steady economic growth. Emerging countries began to fundraise increasingly with sovereign debt securities as of 1990s. The issuance of emerging-market bonds denominated in the U.S. dollar soared to about \$375 billion in 2012, (McCarthy, 2012).

In Kenya bonds trades in both the treasury and corporate bonds. Treasury bonds are interest-bearing securities with maturities one to 30 years offering interest payments on a semi-annual basis throughout to maturity of the bond and on maturity, the investor receives the face value of the bond, (CBK, 2015). These bonds are an important component of a country's financial system and represent a critical component of central banks' monetary policy. Biepeke, (2004), states that treasury bonds act as a bench mark interest rate and form part of the yield curve, which conveys important information for monetary policy. On the other hand corporate bonds are debt securities issued by private and public corporations and sold to investors (Roldes et al., 2004). Corporate bonds provide investors with regular interest payments which may be fixed or vary in accordance with a defined benchmark. These payments are backed by the entity's cash flow or in some cases, the company's physical assets that may be used as security for bonds, (Davis & Jenkinson, 2012). Ehrhardt (2013), also defines corporate bond as a long-term contract under which a borrower agrees to make payments of interest and principal, on specific dates, to the holders of the bond many corporations in the world especially in developed financial markets in the USA, Japan and Western Europe do issue corporate bonds as a means of financing. Companies such as Time Warner, Viacom, TCI, Delta, UAL, USL, and Digital Equipment use borrowed money from investors by issuing bonds, (Mussa & Kihongo, 2011). Corporate bond gives the investor creditor rights in the company; the holder does not have ownership interest in the issuing company unlike a shareholder of a company's stock, (Reszat, 2003).

Macroeconomic news alters interest rates along the yield curve as market participants not only adjust their views about the state and prospects of the economy, but also because they raise expectations about the reaction of monetary policy to such news (Fleming and Remolona, 1999). Asset price movements following regularly scheduled macroeconomic announcements provide a unique source of information about the evolution of public and private sector expectations and about how those expectations reflect back on the economy. IMF and World Bank, (2001), mention that aggressive bond investors must consider market liquidity, investment risks and interest rate behavior. This calls for investors to understand the market and its environment. Efficient markets it's a market where all the information are available to the traders and are incorporated in the price while inefficient market the information is not readily available meaning prices set may be unfavorable to the traders, this is well explained in efficient market theory Fama (1970).

2. STATEMENT OF THE PROBLEM

Although the bond market in Kenya has seen a steady growth line over the last couple of years, the corporate bonds market has had a lower trading activity compared to the treasury bonds market, (Ngugi & Agoti, 2007). There are many macroeconomic factors that are related to the depth and currency composition of bond markets. Investors and the government face difficulty in analyzing the trend of the bond market and macroeconomic indicators can help to analyze this market and hence the purpose of this study.

Several studies have found jumps in this area both local and international. Globally, Nieto, Novalev and Rubio, (2013), conducted a study on macroeconomic and financial determinants of the volatility of corporate bond return applying GARCH model. In this study, it was concluded that macroeconomic indicators seem to do a good job at predicting volatility for high-rating bonds in recession as well as in normal times, while financial indicators provide good estimates of future volatility in recession times. Bengoechea, (2012), examined the relationship between sovereign bond yields spreads and fundamental macroeconomic variables in the Eurozone. The study concluded that there are no constant relationships between fundamental variables and sovereign bond yields spreads across quintiles.

In additional, Fah and Chee, (2013), conducted a study on macro-economic determinants of UK treasury bonds Spread. The study summarized that short term interest rate bear's strong and inverse relationship with UK government bond yield while exchange rate has significant and positive relationship with five-year UK government bond yield. This finding benefits investors, portfolio managers, policy makers and other parties that are related to bond movements and bond investments. This brings up evidence that macroeconomic indicators influence bond performance in UK and other European countries. Zahedul, (2013), studied the effects of major macroeconomic indicators on emerging markets bond index.

Locally, few studies has been done on corporate bond or treasury bonds determinants, uptake and demand, none has addressed the aggregate bonds and how macroeconomic indicators influences performance. Were, (2010), carried out a study on the factors influencing the development of corporate bonds market; a case of Kenyan financial market, Kiuna, (2010), carried a survey on the impact of automated trading system on the bonds market activities where the concluded that there is a significant relationship between trading system and the bond market. Ngugi, (2011), examined on the effect

of regulation on infrastructure bonds uptake in Kenya. Karanja, (2014), carried out a study on determinants of issuance of corporate bonds by listed firms in the Nairobi Securities Exchange. The empirical study focused on the maturity of the bond and price at which the bond are issued. Conclude that investors prefer short term bonds unlike long term and also prefer investing when the interest are high and bonds are low priced. Furthermore, Woldemichael, (2015), establish the effect of financial market infrastructure on issuance of corporate bonds at the Nairobi Securities. The study concentrated on the relationship between payment system and corporate bonds performance which concluded that firms in the NSE have enough assets to cater for their liabilities. Ringui, (2012), also carried out a study on factors determining development of corporate bonds market in Kenya. The study establish that corporate bond market development is influenced by macro-economic environment as measured by various variables including tax regime, inflation, exchange and interest rates, government bond issuance and alternative financing sources.

Ndindo, (2012), carried out a study on the relationship between the government bond issue and economic growth in Kenya. He examined the GDP and the Government bonds traded in NSE in between 2003-2012 and he concluded that there is a strong positive relationship between the GDP and the government bond issuance. Ngabirano, (2016), studied on determinants of corporate bond performance in Kenya. The study focused on both internal and external determinants of corporate bond and the ways to enhance performance of the bond in Kenya. A gap from the existing literature is that there limited study that has considered the influence macro-economic indicators on aggregate bond performance in Kenya. In Kenya the evidence of previous study still exhibit mixed reactions and contradictions. Bond market bowing a very key source of finance and economic vehicle despite the fact that Kenyan banking stocks remain most sensitive and active at NSE. The challenges experienced by investors at the NSE as a result changes in global macro-economic trends, inadequate local studies on the relationship of macro-economic variables and bond performance in Kenya, form the basis of this study to examine the effects of inflation rate as one of the macroeconomic variables on aggregate bond performance in Nairobi securities exchange in Kenya.

3. LITERATURE REVIEW

Inflation can be defined as a persistent increase in general price levels in an economy over the time. Low or medium levels of inflation in a country can have a positive effect on the business sector, in that it can act as an incentive to production. Akers, (2014), states that inflation rate measures changes in the average price level based on a price index. High levels of inflation however can harm company's profitability by affecting the cost of inputs as well as reducing final demand for its output. Myers, (2014), a firm which experiences an inelastic demand for its products may be able to cushion itself from adverse impact of inflation by transferring the price increases to final consumers, thus leaving its margin unaffected. The same could be said of a company operating in a sector with low levels of competition.

From liquidity point of view, inflation is likely to result in an erosion of the real value of any financial claims outstanding an opposed to the nominal value of such claims which may find it with receivables whose real value is diminished, thus inflation harms lenders and tend to benefit borrowers. Dokko, (2009), finds empirical support for a change in inflation to create wealth redistribution between creditors and debtors, while Booth et al. (2001), found that higher inflation leads to a decrease in both total and long term debt ratios in developing countries. Kelly and Miles, (2009), incorporate the capital structure theory to model the response of nominal interest rates to expected inflation on a world with tax. Gajurel, (2015), reveals that for the firms listed at Nepalese stock exchanges inflation is negatively related to leverage ratio.

The bonds market in Kenya trades in both the treasury and corporate bonds. Mbewa, Ngugi and Kithinji, (2007), noted that although treasury bonds were introduced into the market in the early 1980s, the market faced various challenges that constrained its development. Until 2001 when the government took a deliberate effort to shift domestic debt to long term instruments, government bonds maturities were short. Bonds market is an alternative vehicle for mobilizing finance for both the government and the private sector in financing long term projects such as housing and infrastructure development, in addition to financing government deficit. There is no model for determining prices of bonds. In the case of treasury bonds primary market, the government determines the interest rates. The interest rate depends on whether the price is competitive, otherwise also known as "of-the-run" (which is normally close to the interest rate of the previous issue) or non-competitive also known as "on-the-run" (current rate of interest), (Ndindo, 2012).

There are several economic and financial benefits of corporate bond markets. Bond markets significant contribution is in diversifying the source of finance and reducing the reliance on the domestic banks which has been the case in many East

Asian countries. In this way, bond markets stimulate opportunities for risk pooling and risk sharing for both borrowers and lenders. Bond markets can be important means for reducing an economy's vulnerability to maturity risk, exchange rate risk, and unexpected reversal of global private capital flows. Moreover it is clear that bond markets can indirectly improve corporate governance by developing a credit culture, (Das, 2005).

Corporates issue bonds in order to borrow money from investors, who cumulatively make up demand in a given bond market. In the bond market the most relevant and often quoted characteristic of a bond is the interest rate. Bond prices are a function of the interest rate, (Fixler, 2010). Thus all factors held constant the lower the interest rates the higher the bond price-they have an inverse relationship. Bond prices and yields are inversely related: as yields increases, bond prices fall; as yields fall, bond prices rise, an increase in bond's yield to maturity results in a small price change than a decrease in yield of equitable magnitude, prices of long term bonds tend to be more sensitive to interest rate changes than prices of short term bonds, the sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases. The interest rates are directly proportional to bond maturity and are inversely proportional to the coupon rate of bonds. Prices of high coupon bonds are less sensitive to changes in interest rates than prices of low coupon bonds. The Nairobi Securities Exchange, formally Nairobi Stock Exchange was constituted in 1954 as a voluntary association of stock brokers in the European community and was registered under Societies Act. Since then the market has undergone tremendous transformations. At the heart of the Exchange is market liquidity improvement through innovations fostering ethical practices amongst listed companies, (Mwaniki, 2014). The exchange requires that the officers of the listed companies – led by the boards of directors, make optimal decisions that can enhance the welfare of the shareholders, (Ngugi, 2003). Barako, (2007), noted that the Kenyan government legislative bodies have made numeral legislations and reforms aiming to transform the exchange to be the vehicle to mobilize domestic savings and to attract foreign capital investment.

4. RESEARCH METHODOLOGY

The study adopted descriptive research design. The target population for this study was the 155 Board of Directors from the 17 companies which have issued corporate bonds in the NSE and treasury bonds with a tenor of 1-5 years from 2011-2015. The study applied stratified random sampling, where the population was divided into strata as per the sector before using simple random sampling to get a sample from each stratum. This study adopted questionnaire as primary data collection instrument. Secondary data was collected from the NSE, CBK, CMA, KNBS published reports, journals, newspaper and magazines. Descriptive statistics used was frequency distribution tables, pie charts, bar graph and percentages while inferential statistics was multiple regression and correlation analysis. Quantitative data was presented using graphs, frequency distribution tables.

5. FINDINGS

The study sought to ascertain the effect of the inflation rates on aggregate bond performance in NSE. The mean and the standard deviation of independent variables is presented below. The respondents were requested to tick where appropriate, where strongly agree=5, Agree 4, Disagree 3, strongly disagree 2, Neutral 1.

Table 1 Inflation rates

Measures	Mean	Standard deviation
High inflation forces investors to sell bonds and thus firms capital structure as debt-equity ratio drops	3.8	2.45
Future bond cash flow is eroded by inflation where it affects the purchasing power of the local currency	4.5	3.03
Inflation is a function of the dynamics between short-term and long-term interest rates	4.49	3.004
In the long term, bonds are good protection against inflation	4.36	2.99
Changes in inflation rates have an effect on the expected returns on bonds		

The respondents agreed that inflation is a function of dynamic between short term and long term interest rates as shown by the mean of 4.49, future bond cash flow is eroded by inflation where it affects the purchasing power of the local

currency and changes in inflation rates have an effect on the expected returns on bonds also the respondents agreed to this measures as indicated by a mean of 4.5 and 4.36 respectively. Respondents disagreed with the statements that in the long term bonds are good protection against inflation and high inflation forces investors to sell bonds and thus firms capital structure as debt ratio drops as shown by a mean of 3.3 and 3.8 respectively.

A regression analysis was carried out to study the variable. The regression of the Inflation Rates dependent variable, Aggregate Bond Performance was performed. The results show that debt and equity ratio, purchasing power of local currency and bonds expected returns have a significant direct effect on Aggregate Bond Performance as shown below.

Table 2 Regression coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	Beta	Std. Error	Beta		
(Constant)	2.438	.28	-----	8.703	0.003
debt and equity ratio	0.273	.056	0.339	4.886	0.0045
bonds expected returns	0.285	.058	0.591	4.887	0.0067
purchasing power of local currency	-0.112	.047	-0.236	-2.389	0.018

A regression equation of $Y = 2.438 + 0.273\text{debt and equity ratio} + 0.285\text{ bonds expected returns} - 0.112\text{ purchasing power of local currency}$. This shows a linear relationship between the variables.

Table 3 Model Summary

Model Summary				
			Adjusted R Square	Std. Error of the Estimate
Model	R	R Square		
1	0.571	0.326	0.294	0.45298

In the model summary we find that 32.6% Aggregate Bond Performance can be accounted for by debt and equity ratio, purchasing power of local currency and bonds expected returns the adjusted R square is 0.294.

The majority of the respondents were of the view that an inflation change has a direct effect on aggregated bond performance in NSE. From the regression analysis, inflation was found to positively affect the aggregate bond performance in NSE. This is consistent with the findings of Noguera, (2011), who investigated on the relationship between inflation and capital structures finds a positive relationship between leverage and inflation. Akers, (2014), states that inflation rate measures changes in the average price level based on a price index. A high or increasing CPI indicates existence of inflation. Increase rates of inflation signal the possibility of poor macroeconomic health.

6. CONCLUSIONS

From the findings mentioned earlier, it can be concluded that, Inflation Rates significantly affect the aggregate bond performance. Increase in inflation rate leads to a decrease in debt ratio which leads to decrease in performance of the bond performance. This is in line with conclusion in a research by Booth et al. (2001), found that higher inflation leads to a decrease in both total and long term debt ratios in developing countries. Dokko, (2009), on an empirical study found that for a change in inflation it create wealth redistribution between creditors and debtors.

7. RECOMMENDATIONS

The study recommends that the government through its policy makers should come up with measures and policies that will help control and stabilize inflation rate fluctuation in the bond market. This will consequently avoid exploitation by the corporate build the confidence of the investors and thus increasing market investment activity. This will then have a

significant impact on the bond performance traded in NSE thus and eventually improve economic growth. Investors should understand that bonds with shorter durations mature faster, and may be more appropriate for short time investment goals. While longer duration investments may be more appropriate for diversification in a portfolio designed to meet long-term investment goals.

REFERENCES

- [1] African Development Bank (2003). *Harmonization of bond market rules and regulations, August. Reducing the vulnerability of the poor through adaptation*. World Bank.
- [2] CMA (2009). Defining Uptake Status: An application Using Euro-Area Bonds. *National Bureau of Economic Research, Working Paper 9087*
- [3] Daily Nation newspaper dated September 13, 2016 pg 30
- [4] Dickson, P. & Muragu, K. (1994). Market Efficiency in Developing Countries: A Case Study of the Nairobi Stock Exchange. *Journal of Business Finance and Accounting*, 21 (1), 133- 150
- [5] Dunne, P., Moore J. & Portes, R. (2006). European Treasury bond Markets: Transparency, Liquidity, and Efficiency. *Explorations in Economic History* 41, 48-72
- [6] Hakim, V. (2014). The effect of inflation on the stock market returns of the Nairobi securities exchange ,47, 59-65
- [7] Jianheng, Z. S. (2003). Empirical Study of Treasury Bonds Term Structure in Bourse. *Journal of Finance*, 45 (1), 107-134.
- [8] Juan, L. (2006). Strategies and benefits of developing a market for treasury bonds. *Journal of Financial Regulation and Compliance*, 14(1), 47 – 56
- [9] Matemilola, B.T, & Bany-Ariffin, A.N. (2011). Pecking Order Theory of Capital Structure: Empirical Evidence from Dynamic Panel Data. *International Journal on GSTF Business Review* 1 (1): 185–189.
- [10] Mbewa, M. Ngugi, R. & Kithinji, A. (2007). Development Of Bond Market In Kenya: Kenya’s Experience. *Nairobi, KIPPRA*.
- [11] Ministry of Finance Kenya, (2009). *Medium Term Debt Management Strategy*.
- [12] Monia-Kelly, Ngabirano (2016). Determinants of corporate bond performance in Kenya *published MBA United State International University Africa*
- [13] Mussa, S. & Kihongo V. (2011). Prospects and Challenges of Treasury bonds financing in Tanzania. *Asian Journal of Business Management* 3(3), 178-187, 2011
- [14] Nairobi Securities Exchange, (2012). *Monthly statistical bulletin*
- [15] Ndung’u, N. (2013). Challenges in developing a successful bond market in Kenya. *Remarks by Governor of the Central Bank of Kenya, at the Market Leaders Forum dinner, Nairobi, 6 August 2013*.
- [16] Ngugi, D.M. (2011). The Effect of Regulation on Infrastructure Bonds Uptake In Kenya. *MBA Project*, University of Nairobi. *Review of Financial Studies*, 2(3), 297
- [17] Ngugi, R. & Agoti, J. (2007). Microstructure Elements of the Bonds Market in Kenya. Kenya Institute for Public Policy Research and Analysis. *Review of Financial Studies*, 2(3), 297- 310.
- [18] Ngugi, S.M. & Afande, F.O. (2015). Drivers for Issuance of Corporate Bonds by Listed Companies in Kenya. *Developing Country Studies*, 5(7), 143-64.
- [19] Ngugi, W. & Agoti, J. (2007). Microstructure Elements of The Bonds Market in Kenya. *KIPPRA Discussion Paper* 71
- [20] Nyaga, E. M. (2015). Determinants of Treasury bond uptake in Kenya *published MBA Project, University of Nairobi*
- [21] Okech, T. C. & Mugambi M. (2016). *International Journal of Economics, Commerce and Management* 25 - 29

- [22] Owusu-Nantwi, V. & Kuwornu, J. K. M. (2011). *Journal of Economics and International Finance* Vol. 3(11), pp. 605-615
- [23] Pipat, L., Ong, L. & Li, T. (2005). An Anatomy of Corporate Bond Markets: Growing Pains and Knowledge Gains. *IMF Working Paper 5 (152)*
- [24] Reddy, Y.V. (2002). Developing Bond Markets in Emerging Economies: Issues and Indian Experience, *Keynote address at the Asian Bond Conference at Bangkok*
- [25] Ringui, J. (2012). A Survey of Factors Determining Development of Treasury bonds Market in Kenya. *MBA Project, University of Nairobi.*
- [26] Robert, D. Gay, Jr., Effect of Macroeconomic Variables On Stock Market Returns for Four Emerging economies: Brazil, Russia, India, And China *International Business & Economics Research Journal – March 2008 Volume 7, Number 3*
- [27] Rohini, T. (2015). Corporate Bond Markets: An Emerging Markets perspective *Staff Working Paper of the IOSCO Research Department Author.*
- [28] Soh Wei Chee Cheng Fan Fah (2013). Economic Determinants of UK Treasury Bonds Spread *International Journal of Arts and Commerce*
- [29] Sosan Hailekiros Woldemichael (2015). Effect of financial market infrastructure on issuance of corporate bonds at the Nairobi Securities Exchange *published MBA Project, University of Nairobi*
- [30] Souza, C. & Gaa, C. (2004). The Effect of Economic News on Bond market uptake. *Bank of Canada, Working Paper 2004-16*
- [31] Turner, P. (2002). The Development of Bond Markets in Emerging Economies. *BIS Papers (11).*
- [32] Were, J. (2010). An investigation of the factors influencing the development of corporate bonds market: the case of Kenyan Financial Market. *Unpublished MBA Project, University of Nairobi.*