American Journal of
Economics
(AJE)

EFFECT OF ECONOMIC GROWTH ON BONDS PRICES

Margaret Ngaruiya and Dr. Amos Njuguna

American Journal of Economics
ISSN xxxx-xxxx (Paper) ISSN XXXX-XXX (Online)
Vol.1, Issue No.2, pp 1 - 15, 2016

www.ajpojournals.org

EFFECT OF ECONOMIC GROWTH ON BONDS PRICES

[1*] Margaret Ngaruiya
Postgraduate Student, United States International University
*Corresponding Author's email: madgengaruiya@gmail.com
[2] Dr. Amos Njuguna,
Lecturer, United States International University

Abstract

Purpose: The purpose of this study was to establish the effect of economic growth on bond price.

Methodology: The research used an explanatory research design. 65 bonds listed in 23 categories at the NSE. The study used secondary data collected from NSE and the (KNBS) Kenya National Bureau of Statistics. A sample of 10 bonds was selected as these bonds were issued in the January 2008 and were still not mature by the 31st December 2012. Standard deviations were calculated for all the variables in the study. Further statistical analysis was carried out by use of correlation and regression analysis where bond prices were regressed against inflation, exchange rates and economic growth measured using the Kenya's Gross Domestic Product growth. The Statistical Package for Social Sciences (SPSS) version 17 was used to conduct the analysis. The findings were presented in form of tables and figures.

Results: Results on correlation revealed that there was a positive and insignificant relationship between GDP and the bond price and this was confirmed by the regression results which indicated that the inverse of GDP is positively related to bond prices.

Unique contribution to theory, practice and policy: The study recommends that investors who are looking to invest into bonds should consider government policies as this determines the bond prices. It is recommended that economic growth should be enhanced through the pursuit of expansionary monetary and fiscal policies. The use of expansionary monetary policy would be to reduce the interest rates and this would increase the access to finance. These would ensure that more factors of production are put into productive use and thus increasing the national income. Expansionary fiscal policies should include an increase in government spending.

Keywords: *Economic Growth, bond price. Nairobi Securities Exchange.*

1.0 INTRODUCTION

1.1 Background of the Study

Macroeconomics is a branch of economics dealing with the performance, structure, behavior, and decision-making of an economy as a whole, rather than individual markets, which include national, regional, and global economies (Sheffrin, 2003). Macroeconomists study aggregated indicators such as GDP, unemployment rates, and price indices to understand how the whole economy functions.

Macro-economic factors such as inflation, GDP growth, interest rates on alternative financial instruments and exchange rates were employed as control variables across most studies. However, Birchwood (2004) explicitly examined the impact of macroeconomic influences on

nominal and real interest spreads in the Caribbean region. He concluded that differences in interest rate spreads across the region may be due to differences in economic cycles, inflation and liquidity conditions, while the differences in the exchange rate regime affected the magnitude of the spreads. The study also found that countries with fixed exchange rates exhibited lower inflation rates and the highest real spreads (Birchwood, 2004).

Research has been made in examined the effect of market value of privately held U.S and Canadian government debt on the real Canadian dollar/U.S dollar exchange rate by Mcmillan & Koray (1990). In the paper, a model allowing small autoregression to find out if there is any relationship between debt and six other variables - exchange rate, output, price level, interest rate, nominal money and government purchases for both U.S and Canadian. They find that debt shock tend to have a negative relationship on both interest rate and exchange rate, which matched with the Ricardian Equivalence framework.

Research that explains the relationship between the yield curve and macroeconomic variables are important for public policy, bond valuation and investment decisions. This significance has recently induced many other papers in studying this issue. To construct a fine yield curve model, Duffie and Kan (2002) have considered models in which quite a number of unobserved factors explain the whole set of yield curves. There are many term structure models using latent factor models in which the factors are giving indirect comparisons to macroeconomic variables. In the other way around, there are other studies trying to clarify the relationships between bond yields and macro variables in direct model by using vector autoregressive (VAR) models. In a study done by Evans and Marshall (1998), they used VAR models in seeing the relationship of yields of various maturities together with macro variables.

1.2 Problem Statement

The environment of the stock market in Kenya changed considerably in the late 1970s and especially in the 1980s & 90s when it moved from over reliance on the T-bills as the only vehicle of investment to the stock market when the Kenyan Government realized and embraced the need to design and implement policy reforms to foster sustainable economic development with an efficient and stable financial system (NSE, 2011).

This spurred increased activity at the NSE leading to a dramatic increase towards more active stock portfolio management, encouraging substantially more dispersed performance by stock portfolio managers and investors. The dispersion in turn created a demand for techniques that would help investors evaluate the performance of stocks and bonds. The question now is what models are to be used for the above purpose? What are the factors for inclusion on estimating the bond prices? And how will this model be subsequently used to evaluate future bond prices in Kenya. The problem is that despite the increased activity and size of the stock market, the bond market still remains small with majority of the bonds issued by the government and a handful of others by private sector organizations (NSE, 2011). The NSE handbook (2011) indicates that the highest market activity is experienced in the stock market and the bond market only contributes to a very small percentage of the total market activity.

The problem of low participation and size of the bonds market may have been caused by the failure of investors to understand the factors that drive the bond prices. Many models on the factors affecting bond prices have been advanced. For instance, Bhole and Mahakud (2009),

Chau (2012) advocate for the use of the Capital Asset pricing Model (CAPM) in estimating the price of bonds. Merton (1973) and Riley (2003) suggest that the Inter Temporal Capital Asset Pricing Model (ICAMP) is superior to the Capital Asset Pricing Model (CAPM) in estimating bond prices. Bai & Green (2008); Eita, (2011); Chau (2012) have advanced the Abitrage Pricing Model (APT) as a superior approach to selecting the factors that influence bond prices.

However, none of the models are conclusive enough. While some models used in various studies show that the government debt, exchange rate and inflation rate have a positive relationship with bond prices, others show that they have a negative relationship while others don't show any relationship at all. In addition, there are scarce studies on the factors that influence bond prices in Kenya. Majority of the studies focus on developed economies eg Bhole & Mahakud (2009); Bai & Green (2008) & Chau, (2012) and fail to focus on Kenya which is a developing economy. The lack of conclusiveness of the studies and the scarcity of studies in Kenya on factors affecting bond prices forms the knowledge gap. It is for this research gap that this study seeks to close.

1.3 Research Objective

The objective of the study was to investigate the effect of economic growth on bond prices.

2.0 LITERATURE REVIEW

2.1 Economic Growth and Bond Prices

2.1.1 Fiscal Policy

The two main instruments of fiscal policy are government taxation and changes in the level and composition of taxation and government spending can affect the following variables in the economy: Aggregate demand and the level of economic activity; The distribution of income and the pattern of resource allocation within the government sector and relative to the private sector. Fiscal policy refers to the use of the government budget to influence economic activity

2.1.2 Government borrowing

Government debt (also known as public debt, national debt) is the debt owed by a central government. (In the U.S. and other federal states, "government debt" may also refer to the debt of a state or provincial government, municipal or local government.) By contrast, the annual "government deficit" refers to the difference between government receipts and spending in a single year, that is, the increase of debt over a particular year (Mishkin, 2010).

Government debt is one method of financing government operations, but it is not the only method. Governments can also create money to monetize their debts, thereby removing the need to pay interest. But this practice simply reduces government interest costs rather than truly canceling government debt (Mishkin, 2010). Governments usually borrow by issuing securities, government bonds and bills. Less creditworthy countries sometimes borrow directly from a supranational organization (e.g. the World Bank) or international financial institutions.

2.1.3 Government expenditure

Government spending (or government expenditure) includes all government consumption and investment but excludes transfer payments made by a state (Barro & Grilli, 1994). Government acquisition of goods and services for current use to directly satisfy individual or collective needs

of the members of the community is classed as government final consumption expenditure. Government acquisition of goods and services intended to create future benefits, such as infrastructure investment or research spending, is classed as government investment (gross fixed capital formation). Government expenditures that are not acquisition of goods and services, and instead just represent transfers of money, such as social security payments, are called transfer payments. The first two types of government spending, final consumption expenditure and gross capital formation, together constitute one of the major components of gross domestic product.

2.1.4 Taxation

This is a means by which governments finance their expenditure by imposing charges on citizens and corporate entities. Governments use taxation to encourage or discourage certain economic decisions. For example, reduction in taxable personal (or household) income by the amount paid as interest on home mortgage loans results in greater construction activity, and generates more jobs (Sheffrin, 2003; Blanchard, 2000) A tax is a financial charge or other levy imposed upon a taxpayer (an individual or legal entity) by a state or the functional equivalent of a state such that failure to pay is punishable by law. Taxes are also imposed by many administrative divisions. Taxes consist of direct or indirect taxes and may be paid in money or as its labor equivalent (Burg, 2004).

Governments use different kinds of taxes and vary the tax rates. This is done to distribute the tax burden among individuals or classes of the population involved in taxable activities, such as business, or to redistribute resources between individuals or classes in the population. Historically, the nobility were supported by taxes on the poor; modern social security systems are intended to support the poor, the disabled, or the retired by taxes on those who are still working. In addition, taxes are applied to fund foreign aid and military ventures, to influence the macroeconomic performance of the economy (the government's strategy for doing this is called its fiscal policy; see also tax exemption), or to modify patterns of consumption or employment within an economy, by making some classes of transaction more or less attractive (Blanchard, 2000).

Some economists, especially neo-classical economists, argue that all taxation creates market distortion and results in economic inefficiency. They have therefore sought to identify the kind of tax system that would minimize this distortion (Mankiw, 2002). Since governments also resolve commercial disputes, especially in countries with common law, similar arguments are sometimes used to justify a sales tax or value added tax. Others (e.g. libertarians) argue that most or all forms of taxes are immoral due to their involuntary (and therefore eventually coercive/violent) nature. The most extreme anti-tax view is anarcho-capitalism, in which the provision of all social services should be voluntarily bought by the person(s) using them (Mishkin, 2010).

2.1.5 Tax Incentives of Investing in Bonds

Governments frequently use tax policies to encourage certain activities and discourage others. Higher rates of taxation generally reduce aggregate business investment, but it is common for certain assets to receive preferential tax treatment designed to enhance their attractiveness to investors. In the United States, the prevailing view of such preferences is decidedly skeptical; nevertheless, the current U.S. tax code offers special incentives for foreign investment,

investment in R&D, and other restricted categories of activity. In the years before 1987, the use of special incentives was considerably more widespread (Mankiw, 2002).

If a firm loses money and is unable to pay off its debts, bondholders may be able to claim the firm's assets (net of its operating losses and any costs associated with bankruptcy). Conflict of interest stems from anticipation of this possibility, since shareholders, who control firms, invest in assets to maximize returns in those states of the world in which they, and not bondholders, are the residual claimants. Optimizing equity investors allocate resources between assets so as to equalize after-tax marginal returns. Bondholders prefer that firms equalize before-tax marginal returns, since such a rule maximizes the value of the firm if in default. Since the bond market anticipates that shareholder-controlled firms invest to maximize after-tax returns, borrowing rates rise in response to the introduction of specific investment tax incentives. Higher interest rates, in turn, reduce profits and make investment more costly. It is possible that interest rate reactions are so powerful that firms reduce total investment in response to greater incentives (Sheffrin, 2003).

2.1.6 Effects of Economic growth on bond prices

Some research, Bar and Campbell (1997) related UK government bond price and real interest rate in order to find out the relationship between them. In their paper, they used the simple asset pricing method to transfer the prices of UK nominal and index-linked government bonds into implied expected real interest rate. As a result, they find that the short run movement in three-month real interest rate and three-month inflation is negatively related.

Christiansen (2000) continue the study of Balduzzi *et al*. (1997) on the influence of macroeconomic announcements. The research investigated the effect of macroeconomic news announcements on the US Treasury bond market. The study mainly concerned on the impact of employment situation and price index report on Treasury bond yield. By applying multivariate model in exercise the test macroeconomic news announcement on Treasury bond yield she found that the announcements of macroeconomic variables' news significantly impact on the volatility of Treasury bond returns.

Kenny (2013) asserts that while all areas of the bond market ultimately take their cue for Treasuries – since, correctly or otherwise, U.S. government bonds are seen as being the safest investment in the world and are therefore the baseline for the rest of the market – certain types of bonds tend to benefit from stronger growth, rather than being hurt by it. Typically, these areas are high yield bonds, emerging markets bonds, and lower-rated corporate bonds. This is because their yields are high enough that modest moves in Treasury yields have less effect on their performance. As an example, if the 10-year Treasury is yielding 2.0%, a mortgage-backed security with a yield of 2.5% (a 0.5 percentage-point gap) is affected to a greater extent than a below-investment grade corporate bond yielding 8.5% (a 6.5 percentage-point gap). Second, the bonds of corporations and emerging markets trade based on their underlying financial strength. The better their balance sheets, cash balances, and underlying business trends, the less likely they are to default (i.e., miss a payment of principal or interest). And the lower the likelihood of a default, the lower the yield investors will demand to compensate them for the risk of investing in that particular security. As a result, while stronger economic growth can be a negative for Treasuries, it is much more likely to be a positive factor for higher-yielding bonds where the

issuer's creditworthiness is a primary concern for investors. This helps make the case for why investors should diversify rather than emphasize on any one segment of the bond market. Overall, this implies that high yielding bonds have low prices. The effect of economic growth on bond yields is positive but negative on bond prices.

Franklin Global Asset Management (2010) suggests that when the GDP report is released, its value is immediately compared to analysists' expectations. The bond market is likely to react positively if the GDP value is at or below the expected value. This is especially true if real final sales are poor and inventories are increasing because of slowing demands. Flat or declining economic growth is unlikely to motivate the FED to increase interest rates -- this can increase demand for bonds, and push prices higher. Conversely, the value of existing bonds could drop dramatically if GDP exceeds expectations. A strong GDP report coupled with rising inflation will increase speculation and fears that the Federal Reserve will increase short-term interest rates. Concern that the Fed will increase interest rates can cause bond prices to plummet.

Fink, Haiss and Hristoforova (2003) conducted a study on bond markets and economic growth. The authors were able to find a bi-directional causality, or interdependence between the bond sector growth and real growth, in the cases of Japan, Finland and Italy. There is support for supply-leading causality from bond market capitalization change to real growth in USA, Great Britain, Germany, Austria, Switzerland, and to a weaker extent in the Netherlands and Spain. Finally, we find no support for the reverse case, i.e. demand-leading causality from real economic activity to the bond market.

Bonds Squawk (2013) notes that the overall macroeconomic health of the nation has a tremendous influence on the fixed income markets. For example, an economic decline will have an impact on the financial fortune of the issuers of most bonds, be they corporations or state and local governments, thereby affecting the price of the bonds. Issues of lower credit quality are typically more affected, as they are less able to withstand an environment of lower revenues and earnings. In fairly significant downturns, investors usually sell out of equities and lower quality bonds and purchase much safer treasury instruments; most often short maturity treasury bills (T-Bills). This phenomenon is known as a "flight to quality' and can lead to an increase in the price of certain treasury issues for a period of time.

Bonds Squawk (2013) further asserts that experienced bond investors and traders keep a close eye on economic indicators and indexes, such as *gross domestic product (GDP)*, which is the sum of all of a country's goods and services produced in a year; and the *consumer price index (CPI)* which measures the overall rate of change in the prices of consumer goods and services. A faltering economy is not the only concern for bond investors- an economy that is growing too rapidly will lead to excessive demand for goods and services, which will eventually lead to rapidly increasing prices, or price inflation (the law of supply and demand). A declining economy, as evidenced by a declining GDP, and an "overheated" economy, as evidenced by a rapidly increasing GDP, which will eventually lead to significant increases in the CPI, will both have a significant impact on bond prices. In an effort to promote a healthy economy, the U.S. government seeks to maintain moderate growth in GDP. Each administration sets GDP growth targets that may vary according to current and expected economic conditions (e.g. the Obama administration is targeting 6.5% growth for 2010), so it is important to monitor what GDP is doing relative to government targets. If changes in GDP stray too far from the target, the

government will take action to bring it back into line, and these actions will have a significant impact on the financial markets.

3.0 RESEARCH METHODOLOGY

The research used an explanatory research design. 65 bonds listed in 23 categories at the NSE. The study used secondary data collected from NSE and the (KNBS) Kenya National Bureau of Statistics. A sample of 10 bonds was selected as these bonds were issued in the January 2008 and were still not mature by the 31st December 2012. Standard deviations were calculated for all the variables in the study. Further statistical analysis was carried out by use of correlation and regression analysis where bond prices were regressed against inflation, exchange rates and economic growth measured using the Kenya's Gross Domestic Product growth. The Statistical Package for Social Sciences (SPSS) version 17 was used to conduct the analysis. The findings were presented in form of tables and figures.

4.0 RESULTS AND DISCUSSIONS

4.1 Bond Prices

The study sought to establish the effect of bond prices. The results are presented as follows.

4.1.1 10 Year Bond (FXD1/2003/10Yr)

The study sought to establish the bond prices for FXD1/2003/10yr.

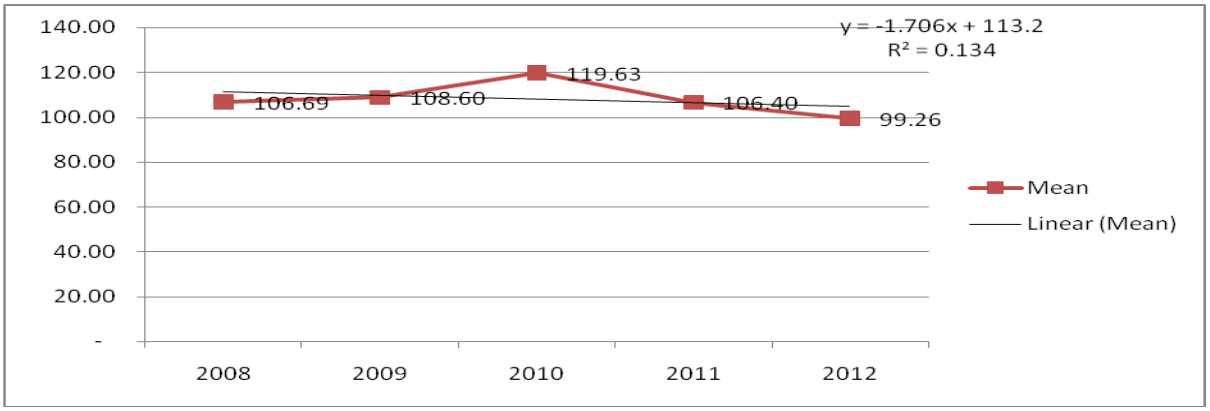

Figure 1: FXD1/2003/10Yr

Results in Figure 1 indicates that the prices for the bond increased to reach to a peak of 119.63 in the year 2010, however the prices declined the following years to a low of 99.26 in the year 2012. The findings implied that the prices of the ten year bond generally declined over the five year period. This also implied that the bond yield went up as there existed negative relationship between bond prices and yields.

4.1.2 10 Year Bond (FXD2/2003/10Yr)

The study sought to establish the bond prices for FXD2/2003/10yr

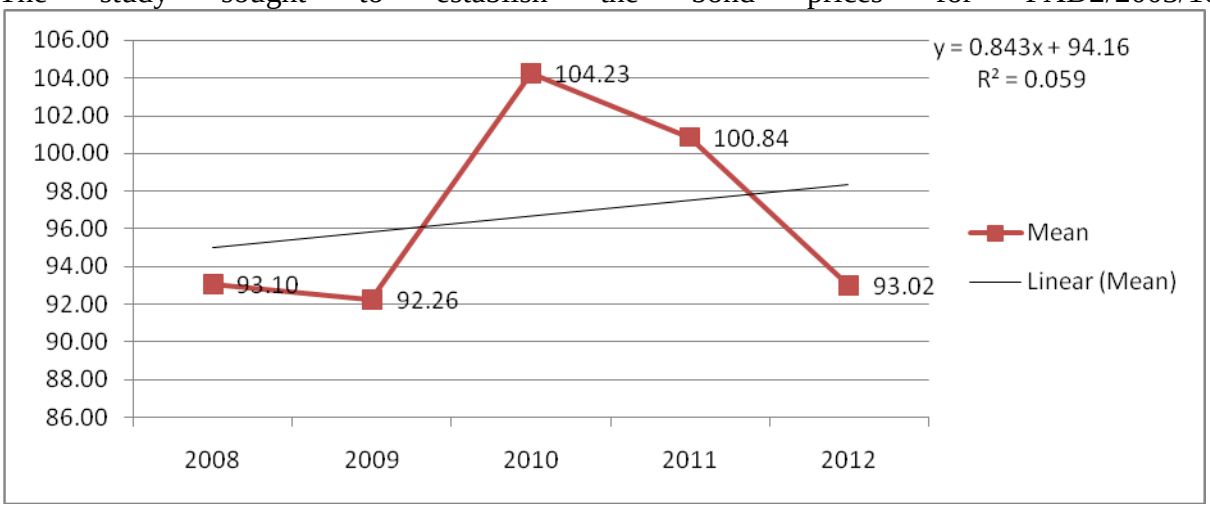

Figure 2:FXD2/2003/10Yr

Results in Figure 2 indicates that the prices for the bond increased to reach to a peak of 104.23 in the year 2010; however the prices declined the following years to a low of 93.02 in the year 2012. The findings implied that the prices of the ten year bond generally increased over the five year period. This also implied that the bond yield went down as there existed negative relationship between bond prices and yields.

4.1.3 10 Year Bond (FXD1/2006/10Yr)

The study sought to establish the bond prices for FXD1/2006/10yr.

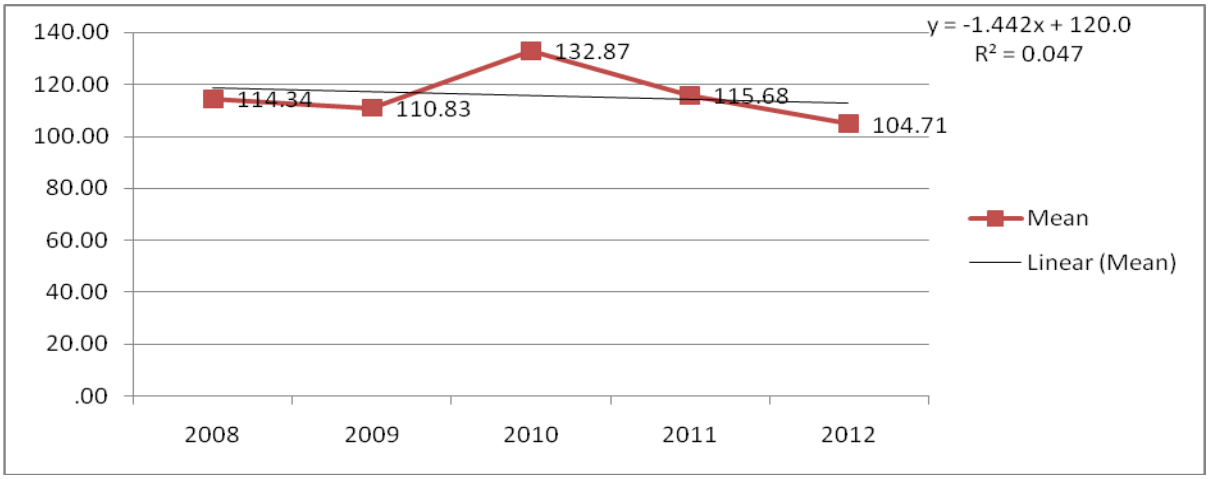

Figure 3:FXD1/2006/10Yr

Results in Figure 3 indicates that the prices for the bond increased to reach to a peak of 32.87 in the year 2010, however the prices declined the following years to a low of 104.71 in the year 2012. The findings implied that the prices of the ten year bond generally declined over the five

year period. This also implied that the bond yield went up as there existed negative relationship between bond prices and yields.

4.1.4 10 Year Bond (FXD2/2006/10Yr)

The study sought to establish the bond prices for FXD2/2006/10yr.

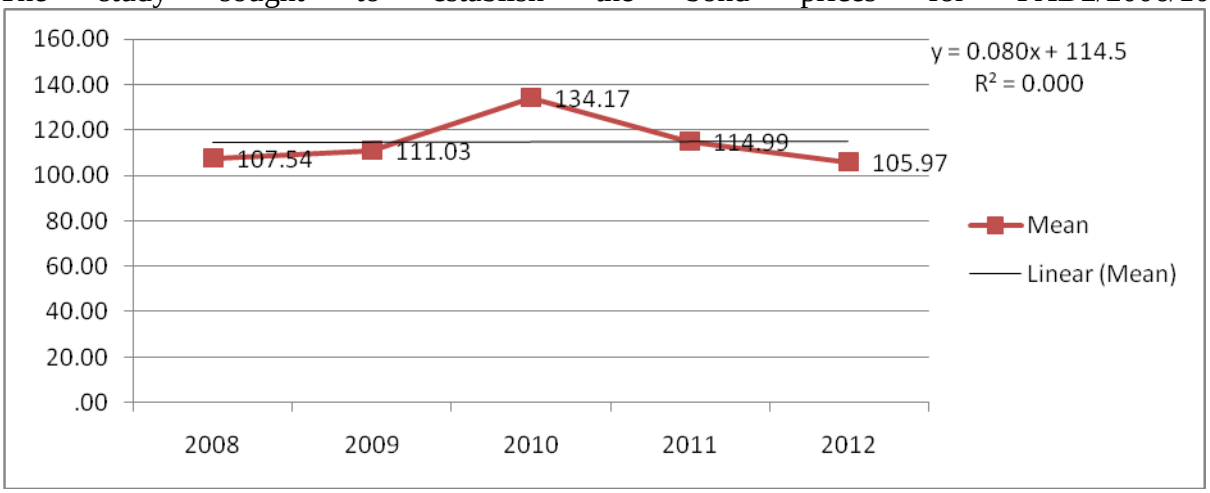

Figure 4:FXD2/2006/10Yr

Results in Figure 4 indicates that the prices for the bond increased to reach to a peak of 134.17 in the year 2010, however the prices declined the following years to a low of 105.97 in the year 2012. The findings implied that the prices of the ten year bond generally increased over the five year period. This also implied that the bond yield went down as there existed a negative relationship between bond prices and yields.

4. 1.5 10 Year Bond (FXD1/2007/10Yr)

The study sought to establish the bond prices for FXD1/2007/10yr.

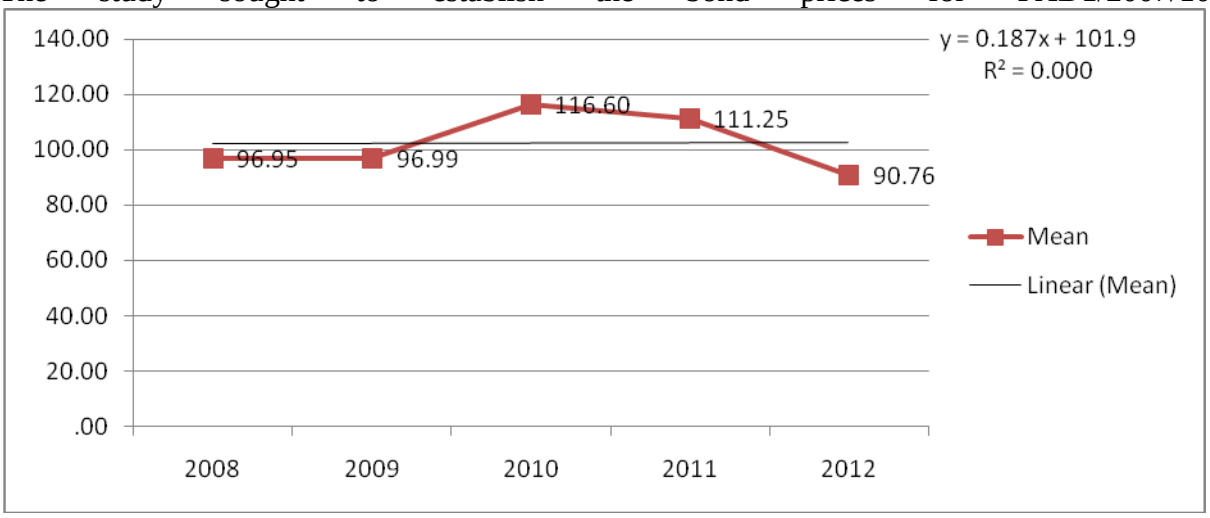

Figure 4:FXD1/2007/10Yr

Results in Figure 5 indicates that the prices for the bond increased to reach to a peak of 116.60 in the year 2010, however the prices declined the following years to a low of 90.76 in the year 2012. The findings implied that the prices of the ten year bond generally increased over the five year period. This also implied that the bond yield went down as there existed negative relationship between bond prices and yields.

4. 1.6 11 Year Bond (FXD1/2006/11Yr)

The study sought to establish the bond prices for FXD1/2006/11yr.

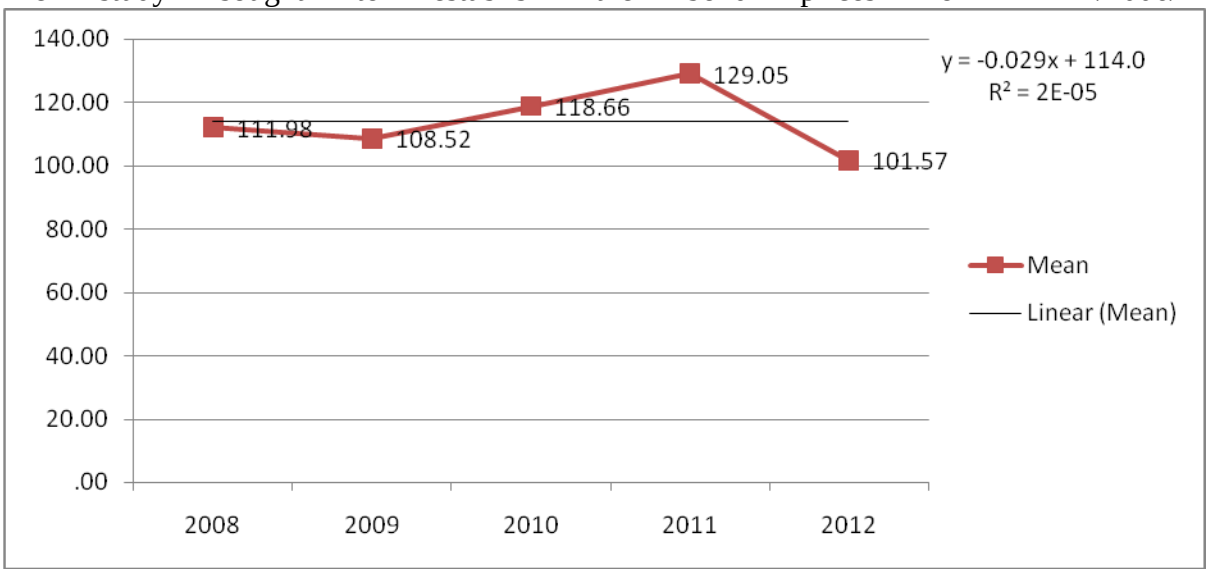

Figure 5:FXD1/2006/11Yr

Results in Figure 6 indicates that the prices for the bond increased to reach to a peak of 129.05 in the year 2011 however the prices declined the following years to a low of 101.57 in the year 2012. The findings implied that the prices of the eleven year bond generally declined over the five year period. This also implied that the bond yield went up as there existed negative relationship between bond prices and yields.

4. 1.7 12 Year Bond (FXD1/2006/12Yr)

The study sought to establish the bond prices for FXD1/2006/12yr.

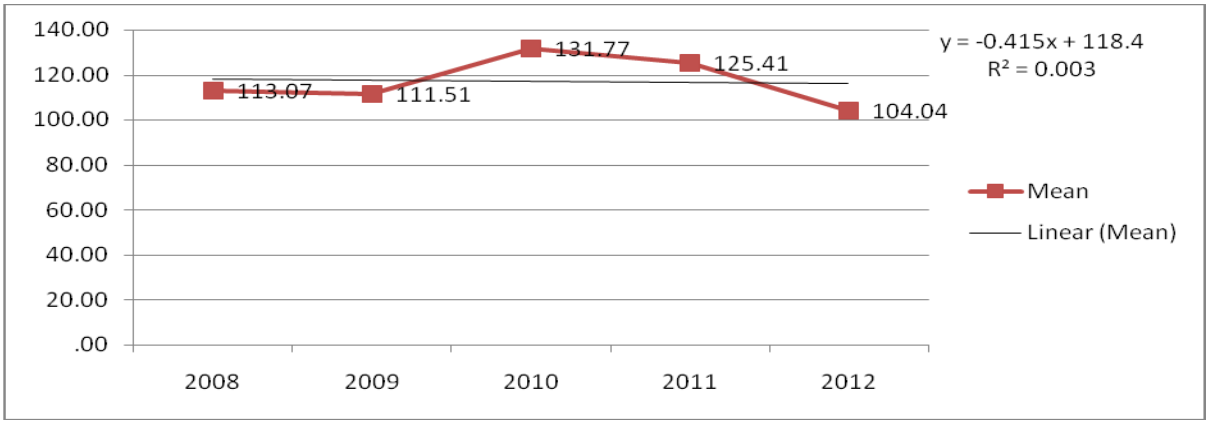

Figure 6:FXD1/2006/12Yr

Results in Figure 7 indicates that the prices for the bond increased to reach to a peak of 131.77 in the year 2010, however the prices declined the following years to a low of 104.04 in the year 2012. The findings implied that the prices of the twelve year bond generally declined over the five year period. This also implied that the bond yield went up as there existed negative relationship between bond prices and yields.

4.2 Effect of GDP on Bonds

4.2.1 Descriptive Results

The study sought to establish the effect of GDP on bond price.

Table 1: Descriptive Statistics for GDP

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
2008	12	339477.75	7211.61	2081.81	334895.71	344059.79	327656.00	344414.00
2009	12	348795.75	1154.49	333.27	348062.22	349529.28	347387.00	350457.00
2010	12	368748.00	4798.75	1385.28	365699.02	371796.98	362850.00	374731.00
2011	12	384796.25	5729.76	1654.04	381155.74	388436.76	379401.00	393200.00
2012	12	406701.38	27229.74	7860.55	389400.42	424002.33	373778.00	441430.50
Total	60	369703.83	27536.28	3554.92	362590.45	376817.20	327656.00	441430.50

Results in Table 1 revealed that GDP had a mean of 3339477.75 in 2008 and a mean of 348795.75 in 2009 and in 2010 to 212 the mean increased gradually from 348795.75 in 2009 to 3688748.00 in 2010 to 384769.25 in 2011 finally to 406701.38. The findings implied that the national incomes had consistently increased over the 5 year period. This further implied that the government had put it in place macroeconomic policies which were expansionary in nature and

which supported the creation of additional incomes. Such expansionary measures included a reduction in interest rates and an increase in government expenditure.

4.1.2 Correlations between GDP and Bonds

The study sought to establish whether GDP influences bond price.

Table 2: Correlations between GDP and Bonds

		Average Bond prices	GDP
Average Bond prices	Pearson Correlation	1	.038
	Sig. (2-tailed)		.771
	N	60	60
GDP	Pearson Correlation	.038	1
	Sig. (2-tailed)	.771	
	N	60	60

Results in Table 2 revealed that there was a positive and insignificant relationship between GDP and the bond price ($r = 0.038$, $p > 0.01$). The findings implied that an increase in Gross domestic product was associated with a rise in the average bond prices. However, the relationship was not statistically significant implying that factors other than GDP could have contributed to the change in the average bond prices.

4.2.3 Regression Analysis of GDP and Bond Price

Regression analysis was conducted empirically to determine the relationship between the effects of GDP on bond price.

Table 3: Regression Coefficients

Estimate	Value	T-Statistic	P value
(Constant)	103.791	4.546	.000
GDP	1.802	.293	.771
F	.086		0.000
R	.038[a]		
R square	0. 001		

Dependent variable	Average Bond prices
Independent variable	GDP

Regression result in Table 3 indicates that the goodness of fit of the model was satisfactory. This finding was supported by an r squared of 0.001. An r squared of 0.001 indicates that 0.01% of variation in bond price is explained by GDP.

Regression results indicate that GDP is positively related to bond prices. This was evidence by a regression coefficient of 1.802 (p value = 0.771). The relationship was insignificant at 0.05 critical value since the reported p value 0.000 was more than that the critical value of 0.05.

An Analysis of Variance (ANOVA) statistics indicate that the overall model was significant. This was supported by an f statistic of 0.086 (p value = 0.771). The ANOVA results demonstrated that the independent variable (GDP) is a good predictor of average bond prices.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study concluded that the GDP has consistently increased for the 5 years under study. This implied that economic growth led to an increase in bond prices. The study results indicate that the government maybe pursuing policies aimed at enhancing the national incomes. Such polices were expansionary in nature. The results further revealed that a rise in GDP by 1 unit led to an increase in bond prices by 1.802 units. The study also concludes that there was a positive and insignificant relationship between GDP and the bond price.

5.2 Recommendations

The study recommends that investors who are looking to invest into bonds should consider government policies as this determines the bond prices. It is recommended that economic growth should be enhanced through the pursuit of expansionary monetary and fiscal policies. The use of expansionary monetary policy would be to reduce the interest rates and this would increase the access to finance. These would ensure that more factors of production are put into productive use and thus increasing the national income. Expansionary fiscal policies should include an increase in government spending.

REFERENCES

Bai Y.& Green C.J. (2008). *Determinants of Cross-Sectional Stock Return Variations In Emerging Markets.* AES, Business School, Napier University, Edinburgh, EH14 1DJ, United Kingdom

Barro, R & Grilli, V (1994), *European Macroeconomics*, Ch. 8, p. 139, Fig. 8.1. Macmillan, ISBN 0-333-57764-7

Bhole, L.M., & Mahakud, J. (2009). *Financial institutions and markets: structure, growth and innovations.* (5 ed., pp. 38-39). New Delhi: Tata McGraw-Hill.

Birchwood, A.(2004). *An Examination of the Macro-economic Influence on Nominal and Real Interest Rate Spreads in the Caribbean.* Presented at the XXXVIth Annual Monetary Studies Conference, Central Bank of Trinidad & Tobago

Blanchard, O. (2000). *Macroeconomics* (2nd ed.). Englewood Cliffs, N.J: Prentice Hall

Blanchard, O.(2011). *Macroeconomics Updated* (5th ed.). Englewood Cliffs: Prentice Hall. ISBN 978-0-13-215986-9.

Bonds Squawk (2013). *Bond Risk.* Retrieved from http://www.bondsquawk.com/bond-risk/

Burg, D. F. (2004). *A World History of Tax Rebellions.* pp. vi-viii. ISBN 9780415924986

Chau, M. (2012).*Macroeconomic Determinants of Gold Industry Stock Returns*. Honors Projects. Paper 26. http://digitalcommons.iwu.edu/busadmin_honproj/26

Duffie D. & Kan R. (2002). Universal State Prices and Asymmetric Information, *Journal of Mathematical Economics* 38, 191–196

Evans L.C. & Marshall A.D. (1998). Monetary Policy and the Term Structure of Nominal Interest Rates: Evidence and Theory. *Carnegie-Rochester Conference Series on Public Policy*, 49, 53-111

Fink, G, Haiss, P, and Hristoforova, S. (2003). *Bond Markets and Economic Growth*. IEF Working Paper Nr. 49

Franklin Global Asset Management (2010). *Gross Domestic Product (GDP) and its impact on Bonds, Stocks, and the U.S. Dollar*. Retrieved from http://www.fgam.us/Articles/101106.GDP/GDP.php

Kenny, T. (2013). *The Impact of Inflation on Bonds*. Retrieved from http:// bonds about.com/ od/ bonds101/a / The Impact Of Inflation On Fixed Income-Investments.htm

Mankiw, N. G. (2002). *Macroeconomics* (5th ed.). NewYork. Worth Publishers .

Mcmillin W. D. and Koray F. (1990). Does Government Debt Affect Exchange Rate? An Empirical Analysis of the U.S- Canadian Exchange Rate. *Journal Economic Business ,42, 279-288.*

Merton R.C. (1973). An analytic derivation of the efficient portolio frontier, *Journal of Financial and Quantitative Analysis* 7 (1973), 1851–1872.

NSE (2011). NSE Handbook 2011.

Sheffrin, S.M. (2003). *Economics: Principles in action. Upper Saddle River, New Jersey* 07458: Pearson Prentice Hall. pp. 552. ISBN 0-13-063085-3.