

American Journal of Economics (AJE)



**EFFECT OF EXCHANGE RATES ON BONDS
PRICES: A SURVEY OF BONDS LISTED AT
THE NAIROBI SECURITIES EXCHANGE**

Margaret Ngaruiya and Dr. Amos Njuguna



EFFECT OF EXCHANGE RATES ON BONDS PRICES: A SURVEY OF BONDS LISTED AT THE NAIROBI SECURITIES EXCHANGE

^{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 exchange rates 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: The study found out that Correlation results also indicated that there was a positive and insignificant relationship between exchange rate and the bond price; this was also supported by regression results which indicated that the inverse of exchange rate is positively related to bond prices.

Unique contribution to theory, practice and policy: The study recommends that investors should also consider factors such as exchange rate as this determines the bond prices. It is recommended that the monetary authority should use policies aimed at weakening the Kenya shilling as doing so would increase bond prices. This is because bond prices would be cheaper and more attractive to foreign investors.

Keywords: Exchange rates, bond price. Nairobi Securities Exchange.

1.0 INTRODUCTION

1.1 Background of the Study

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).

The exchange rate risk occurs when the amount being paid in currency is worth less in real term where bond yield will be influenced (Hilscher & Nosbusch, 2010). Hence, the existence of exchange rate risk is positive correlation with world market bond portfolio. Also, Purchasing Power Parity theoretically can be used to hedge the exchange rate risk of UK government in purchasing and selling of government bonds. Investors can gain returns by hedging government bonds and therefore his paper concludes that the exchange rate has an impact in influencing government bond yields (Hilscher & Nosbusch, 2010).

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 auto regression 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 & 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 and Green (2008); Eita, (2011); Chau (2012) have advanced the Arbitrage 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) and 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 this study was to determine the effect of exchange rates on bond prices.

2.0 LITERATURE REVIEW

2.1 Exchange Rates and Bond Prices

Exchange rates are determined in the foreign exchange market (Sheffrin, 2003) which is open to a wide range of different types of buyers and sellers where currency trading is continuous: 24 hours a day except weekends, i.e. trading from 20:15 GMT on Sunday until 22:00 GMT Friday.

2.1.1 Movement in Exchange rates

Aside from factors such as interest rates and inflation, the exchange rate is one of the most important determinants of a country's relative level of economic health. Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world. For this reason, exchange rates are among the most watched analyzed and governmentally manipulated economic measures. But exchange rates matter on a smaller scale as well: they impact the real return of an investor's portfolio (Sheffrin, 2003).

A flexible exchange-rate system is a monetary system that allows the exchange rate to be determined by supply and demand (Sheffrin, 2003). Every currency area must decide what type of exchange rate arrangement to maintain. Between permanently fixed and completely flexible however, are heterogeneous approaches. They have different implications for the extent to which national authorities participate in foreign exchange markets. According to their degree of flexibility, post-Bretton Woods-exchange rate regimes are arranged into three categories: currency unions, dollarized regimes, currency boards and conventional currency pegs are described as "fixed-rate regimes"; Horizontal bands, crawling pegs and crawling bands are grouped into "intermediate regimes"; Managed and independent floats are described as flexible

regimes. All monetary regimes except for the permanently fixed regime experience the time inconsistency problem and exchange rate volatility, albeit to different degrees (Bernholz, 2003).

2.1.2 Effect on Shilling

Interest rates, inflation and exchange rates are all highly correlated. By manipulating interest rates, central banks exert influence over both inflation and exchange rates, and changing interest rates impact inflation and currency values. Higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise. The impact of higher interest rates is mitigated, however, if inflation in the country is much higher than in others, or if additional factors serve to drive the currency down. The opposite relationship exists for decreasing interest rates - that is, lower interest rates tend to decrease exchange rates (Taylor, 2008).

The current account is the balance of trade between a country and its trading partners, reflecting all payments between countries for goods, services, interest and dividends. A deficit in the current account shows the country is spending more on foreign trade than it is earning, and that it is borrowing capital from foreign sources to make up the deficit. In other words, the country requires more foreign currency than it receives through sales of exports, and it supplies more of its own currency than foreigners demand for its products. The excess demand for foreign currency lowers the country's exchange rate until domestic goods and services are cheap enough for foreigners, and foreign assets are too expensive to generate sales for domestic interests (Sheffrin, 2003).

2.1.3 Effect on Dollar

A ratio comparing export prices to import prices, the terms of trade is related to current accounts and the balance of payments. If the price of a country's exports rises by a greater rate than that of its imports, its terms of trade have favorably improved. Increasing terms of trade shows greater demand for the country's exports. This, in turn, results in rising revenues from exports, which provides increased demand for the country's currency (and an increase in the currency's value). If the price of exports rises by a smaller rate than that of its imports, the currency's value will decrease in relation to its trading partners (Barro & Grilli, 1994; Parsley & Wei, 2001).

Foreign investors inevitably seek out stable countries with strong economic performance in which to invest their capital. A country with such positive attributes will draw investment funds away from other countries perceived to have more political and economic risk. Political turmoil, for example, can cause a loss of confidence in a currency and a movement of capital to the currencies of more stable countries (Mohan, 2009).

2.1.4 Effect of exchange rate on bond prices

Empirical evidence indicates that nominal exchange rate changes are not fully passed through to goods prices. In fact, it appears that consumer prices are very unresponsive to nominal exchange rate changes (Parsley and Wei, 2001). An implication of this finding is that the "expenditure-switching" effect of exchange rate changes might be very small. That is, a change in the nominal exchange rate might not lead to much substitution between domestically-produced goods and internationally-produced goods, because the relative prices of those goods do not change much for final users. If the exchange rate change has little effect on the behavior of final purchasers of

goods, then it may take large changes in exchange rates to achieve equilibrium after some shock to fundamentals (Devereux & Engel, 2000).

Jahjah, Wei and Yue (2012) conducted a study on exchange rate policy and sovereign bond spreads in developing countries. The authors analyzed how exchange rate policy affects the issuance and pricing of international bonds for developing countries, and found that countries with less flexible exchange rate regimes pay higher sovereign bond spreads and are less likely to issue bonds. Quantitatively, changing a free-floating regime to a fixed regime decreases the likelihood of bond issuance by 4.6% and increases the bond spread by 1.3% on average. Furthermore, countries with real exchange rate overvaluation have higher bond spreads and higher bond issuance probabilities. Moreover, such positive effects of real exchange rate overvaluation tend to be magnified for countries with fixed exchange rate regimes. The results suggested that choosing a less flexible exchange rate regime in general leads to higher borrowing costs for developing countries, especially when their currencies are overvalued.

A few empirical studies have incorporated the exchange rate policy into the assessment of sovereign default risk. Some works include exchange rate devaluation as one determinant of spreads, but the impact of devaluation is not significant. Some authors have studied the liability dollarization and the effect of real exchange rates on the ability to pay dollar debt. Arrelano (2003) found that in Argentina real exchange rate appreciation is associated with a sudden stop in capital flow and high interest rate. Obstfeld & Taylor (2003) investigated the impact of the interwar gold standard on London bond market. But none of the works study the full impact of exchange rate policy (regime and exchange rate level) on sovereign bonds.

Jahjah and Montiel (2003) explored the link between debt crises and exchange rate policy in a theoretical framework. The authors modeled the government's fiscal and debt-servicing policy, as well as exchange rate policy. The interaction between exchange rate policy and debt repayment may differ depending on the degree of exchange rate misalignment and investors' expectation. The authors showed that under a hard peg, the absence of an exchange rate instrument can lead to default equilibrium, especially if the country experiences a serious exchange rate misalignment. However, a more flexible exchange rate regime yields multiple equilibria, one of which is characterized by exchange rate misalignment, high interest rates, and default. Exchange rate regimes that "go to the extreme" are prone to debt crises; however, the dynamics of the crises differs substantially.

A related literature focuses on the effects of macroeconomic announcements on various asset prices. Andersen, Bollerslev, Diebold and Vega (2003) & Ehrmann and Fratzscher (2004c) show that in particular US macroeconomic news have a significant effect on the US dollar – euro exchange rate. For bond markets Goldberg and Leonard (2003) and Ehrmann & Fratzscher (2004b) find that not only macroeconomic news are an important driving force behind changes in bond yields, but that there are significant international bond market linkages between the United States and the euro area. The results of Ehrmann & Fratzscher (2004b) indicate that spillovers are stronger from the US to the euro area market, but that spillovers in the opposite direction are present since the introduction of the euro in 1999.

Andersen, Fair (2003) and Faust, Rogers, Wang & Wright (2003) look at the effect of macro announcements on high-frequency asset returns across several asset prices, such as exchange

rates and the yield curve, confirming the importance of news and in some cases finding a significant response of risk premia or an overshooting of exchange rates in the short run.

Global Investor (2013) notes that Exchange rates affect bond prices because if, for instance, the pound is struggling against other currencies, the Bank of England may feel it necessary to increase interest rates. An increase in interest rates yields the yield of bonds but at the same time lowers the prices of bonds.

AFME Finance for Europe (2013) suggests that Currency exchange rate movements can also lead to inflation. For example, the author notes that recently the Euro has moved to record highs against the dollar. The cost of European imported goods to the US rises and that can lead to increases in inflation in the US. This process, if continued over time, can lead to a depreciation of the currency of the country with a higher inflation rate compared to the country or region with lower inflation rates. As noted above, inflation erodes the value of investment returns over time and investors are likely to move their investments to other countries or markets that have lower inflation rates in order to have more value from their investments. Inflation forces the investor to work to make his investments first keep up with the rate of inflation just to maintain his existing purchasing power. If an investor has a bond with a fixed rate coupon and principal at maturity, inflation affects the value negatively of the interest rate coupon payments that he receives. As noted above, the inflation-interest rate connection means that when inflation increases, interest rates rise too--we know that when interest rates rise, bond prices fall.

Bond Squawk, (2013) suggest that Currency risk occurs only when an investor purchases a bond that is denominated in a foreign currency. The exchange rate between any two currencies is constantly changing due to such factors as the two countries' relative balance of payments and level of interest rates. If a U.S. investor purchases a euro denominated bond, his future payments of interest and principal are made in Euros. Because the investor will have to exchange those Euros for U.S. dollars when they receive the payment in the future, changes in the dollar/euro exchange rate will affect how many dollars the investor receives in the future. There is a risk that the investor will get back less dollars than they anticipated, which would adversely affect the actual yield to maturity that they will realize. For example, if one euro is worth \$2, a bond payment of 100 Euros will be worth \$200. If the euro strengthens relative to the dollar to be worth \$2.50, that same payment will be worth \$250. So investors that purchase bonds denominated in a foreign currency hope that the currency increases in value relative to their home currency. The risk to U.S. investors is that the currency weakens and the investor is paid back with fewer dollars.

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

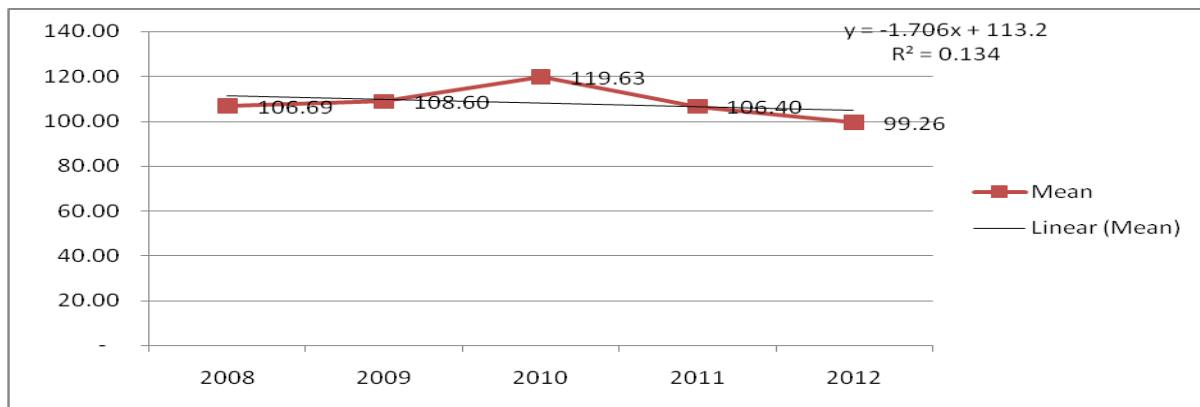


Figure 1: FXD1/2003/10Yr

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.

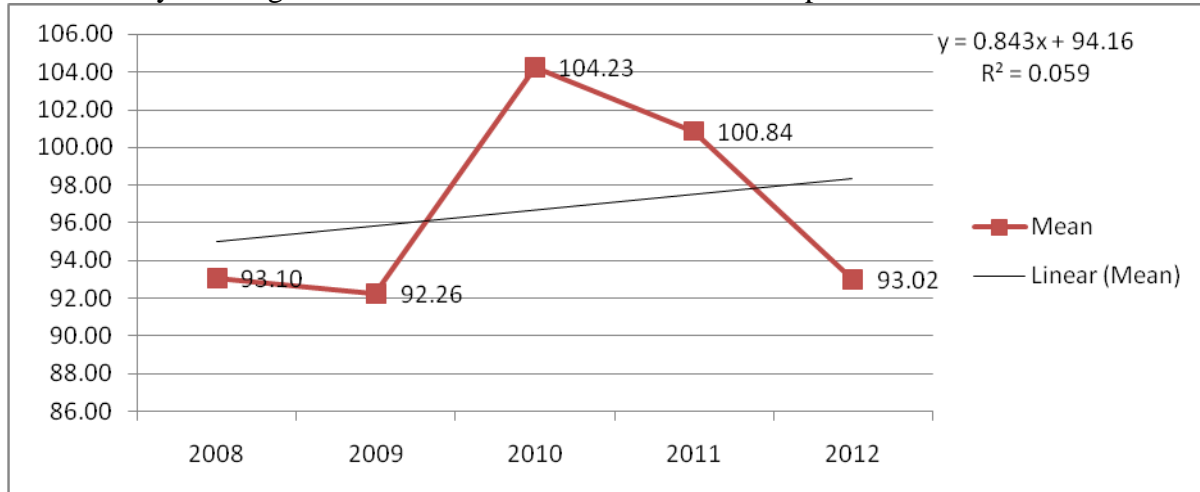


Figure 2:FXD2/2003/10Yr

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.

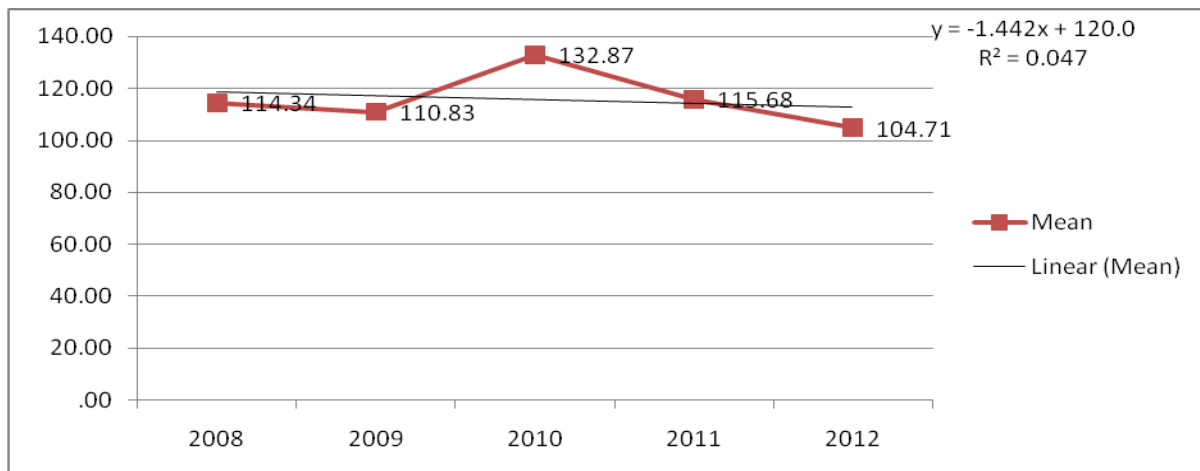


Figure 2:FXD1/2006/10Yr

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.

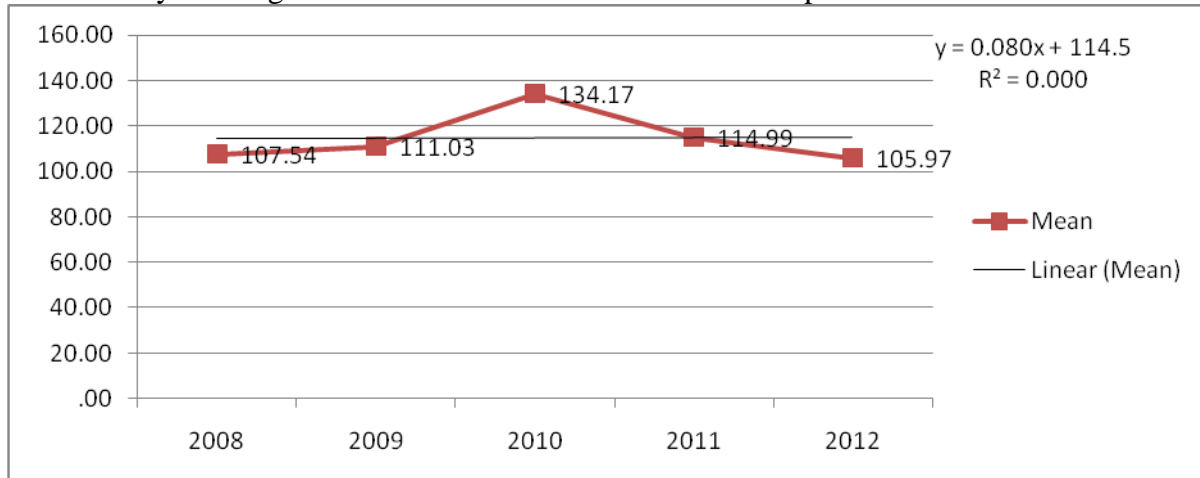


Figure3:FXD2/2006/10Yr

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.

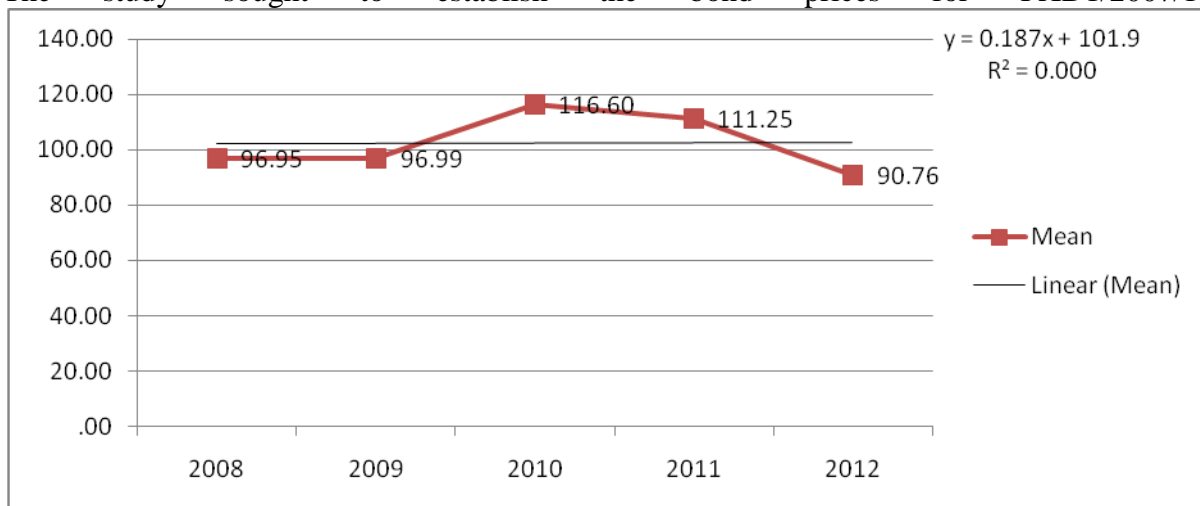


Figure 4:FXD1/2007/10Yr

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.

4.2 Effect of Exchange Rates on Bonds

4.2.1 Descriptive Results

The study sought to establish the effect of exchange rate on bond price. The findings were presented in the following sub section. The particular exchange rates that the study focused on were USD rate, UK Pound rate, Euro rate and the SA rand and the Ugandan shilling.

4.2.1.1 Exchange Rates for Dollar

Results in Table 1 indicated the exchange rates for dollar. In the year 2008, the dollar had a mean of 69.19, in the year 2008 and in 2009 the mean increased to 77.35 the mean figure slightly increased to 79.23 in 2010 and in 2011 the mean increased to 88.81 and decreased further to 84.63 in 2012. The findings implied that the Kenyan shilling had consistently depreciated against the US dollar over the 5 year period and this could have caused bonds to be cheaper to foreign investors.

Table 1: Descriptive Statistics for Dollar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2008	12	69.19	5.88	1.70	65.45	72.92	61.90	78.18
2009	12	77.35	1.93	0.56	76.13	78.57	74.74	80.26
2010	12	79.23	2.03	0.59	77.94	80.53	75.79	81.43
2011	12	88.81	6.24	1.80	84.84	92.78	81.03	101.27
2012	12	84.63	1.17	0.34	83.88	85.37	82.90	86.34
Total	60	79.84	7.80	1.01	77.83	81.86	61.90	101.27

4.2.1.2 Exchange Rate for UK Pound

Results in Table 2 indicated the exchange rates for dollar. In the year 2008, the dollar had a mean of 127.29 and the mean reduced to 120.90 in 2009 and it slightly increased to 122.51 in 2010 and further increased to 142.34 in 2011 and increased to 134.51 in the year 2012. The findings

implied that the Kenyan shilling had generally depreciated against the UK Pound over the 5 year period and this could have caused bonds to be cheaper to foreign investors.

Table 2: Descriptive Statistics for UK Pound

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2008	12	127.29	6.32	1.82	123.27	131.31	116.53	138.46
2009	12	120.90	4.87	1.41	117.81	124.00	113.98	127.22
2010	12	122.51	4.59	1.32	119.59	125.43	115.2	128.52
2011	12	142.34	9.45	2.73	136.33	148.34	127.7	159.41
2012	12	134.51	3.00	0.87	132.60	136.41	131.18	139.02
Total	60	129.51	9.93	1.28	126.94	132.08	113.98	159.41

4.2.1.3 Exchange Rates for Euro

Results in Table 3 indicated the exchange rates for Euro. In the year 2008, the Euro had a mean of 101.22 and decreased to 108.73 in 2009 and to 105.12 in 2010 and it slightly increased to 123.60 in 2011 and decreased to 108.93 in the following year. The findings implied that the Kenyan shilling had generally depreciated against the EURO over the 5 year period and this could have caused bonds to be cheaper to foreign investors.

Table 3: Descriptive Statistics for Euro

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2008	12	101.22	2.86	0.83	99.41	103.04	96.32	105.56
2009	12	108.73	3.05	0.88	106.80	110.67	104.85	114.54
2010	12	105.12	3.93	1.14	102.62	107.62	98.79	112.20
2011	12	123.60	9.42	2.72	117.61	129.59	108.16	138.74
2012	12	108.93	2.83	0.82	107.13	110.73	103.46	113.56
Total	60	109.52	9.09	1.17	107.17	111.87	96.32	138.74

4.2.1.4 Exchange Rates for SA Rand

Results in Table 4 indicated the exchange rates for SA Rand. In the year 2008, the SA Rand had a mean of 8.56 and increased to 9.26 in 2009 and also to 10.83 and in 2010 it slightly increased to 12.27 in 2011 and increased to 10.36 in the last year. The findings implied that the Kenyan shilling had generally depreciated against the SA rand over the 5 year period and this could have caused bonds to be cheaper to foreign investors.

Table 4: Descriptive Statistics for SA Rand

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2008	12	8.56	0.66	0.19	8.15	8.98	7.83	9.77
2009	12	9.26	0.83	0.24	8.73	9.79	7.95	10.07
2010	12	10.83	0.62	0.18	10.44	11.23	10.01	11.79
2011	12	12.27	0.83	0.24	11.74	12.79	10.56	13.23
2012	12	10.36	0.36	0.10	10.13	10.59	9.85	10.9
Total	60	10.26	1.45	0.19	9.88	10.63	7.83	13.23

4.2.5 Exchange Rate for Uganda Shilling

Results in Table 5 indicated the exchange rates for Uganda shilling. In the year 2008, the shilling had a mean of 24.92 and increased to 26.27 in 2009, and increased to 27.46 in 2010 and to 28.43 in 2011 and further to 29.52 in 2012. The finding implied the exchange rate for Uganda shilling increases consistently. The findings implied that the Kenyan shilling had generally appreciated against the Ugandan Shilling over the 5 year period and this could have caused bonds to be more costly to foreign investors from Uganda.

Table 5: Descriptive Statistics for Uganda Shs

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2008	12	24.92	1.16	0.34	24.18	25.65	23.07	27.05
2009	12	26.27	1.33	0.38	25.42	27.11	24.73	28.84
2010	12	27.46	0.92	0.27	26.87	28.05	25.53	28.59

2011	12	28.43	0.67	0.19	28.01	28.85	27.61	29.69
2012	12	29.52	0.97	0.28	28.90	30.13	27.9	31.26
Total	60	27.32	1.91	0.25	26.82	27.81	23.07	31.26

4.2.2 Correlations between Exchange Rates and Bonds

The study sought to establish whether exchange rate influences bond price. Results in Table 6 revealed that there was a positive and insignificant relationship between exchange rate and the bond price ($r = 0.140$, $p > 0.01$). The findings implied that a rise in exchange rate which was also interpreted as depreciation or weakening of the Kenyan Shilling was associated with a positive increase in bond prices. However, the association was not statistically significant.

Table 6: Correlations between Exchange Rates and Bonds

		Average Bond prices	Exchange Rates
Average Bond prices	Pearson Correlation	1	.140
	Sig. (2-tailed)		.286
	N	60	60
Exchange Rates	Pearson Correlation	.140	1
	Sig. (2-tailed)	.286	
	N	60	60

4.2.3 Regression Analysis of Exchange Rate and Bond Price

Regression analysis was conducted empirically to determine the relationship between the effects of exchange rate on bond price. Result in Table 7 indicates that the goodness of fit of the model was satisfactory. This finding was supported by an r squared of 0.020. An r squared of 0.020 indicates that 2.0% of variation in bond price is explained by exchange rate.

Regression results indicate that the exchange rate is positively related to bond prices. This was evidence by a regression coefficient of 0.232 (p value = 0.286). 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 increase in exchange rate by one unit leads to an increase in bond price by 0.232 units.

An Analysis of Variance (ANOVA) statistics indicate that the overall model was significant. This was supported by an f statistic of 1.160 (p value = 0.286). The ANOVA results demonstrated that the independent variable (exchange rate) is a good predictor of average bond prices

Table7: Regression Coefficients

Estimate	Value	T-Statistic	P value
(Constant)	91.932	5.322	.000
Exchange Rates	.232	1.077	.286
F	1.160		.286 ^a
R	.140 ^a		
R square	.020		
Dependent variable	Average Bond prices		
Independent variable	Exchange Rates		

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

It was concluded from the findings that the US dollar Kenya Shilling exchange consistently increased for the period 2008 to 2012. This is an indication that the Kenyan shilling is depreciating and this further implied an unfavorable balance of payments. The study indicated that the UK pound to the Kenya Shilling exchange rate has generally increased thus indicating that the Kenya shilling has depreciated. The Euro, the South African Rand and the Ugandan Shilling exchange to Kenya shilling also increased implying that the Kenya Shilling depreciated. It was concluded that there was a positive and insignificant relationship between exchange rate and the bond price. This implied that an increase in exchanges lead to an increase in bond prices though not significantly.

5.2 Recommendations

The study also recommends that investors should also consider factors such as exchange rate as this determines the bond prices. It is recommended that the monetary authority should use policies aimed at weakening the Kenya shilling as doing so would increase bond prices. This is because bond prices would be cheaper and more attractive to foreign investors.

REFERENCES

Andersen, T., Bollerslev, T., Diebold, F.X. and Labys, P.,(2003), Modeling and Forecasting Realized Volatility, *Econometrica*, 71, 529-626

Arellano, C. (200). Default Risk and Income Fluctuations in Emerging Economies, *The American Economic Review* , Vol. 98, No. 3, pp. 690-712.

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

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

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

Delvaux, J. (2013). *The case for investing in sub-Saharan Africa bond markets*. Retrieved from <http://www.howwemadeitinafrica.com/the-case-for-investing-in-sub-saharan-africa-bond-markets/25543/>

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

Ehrmann, M. & Fratzscher M. (2004b). Equal size, equal role? Interest rate interdependence between the euro area and the United States, *Economic Journal*,

Ehrmann, M. & Fratzscher, M (2004c). Exchange rates and fundamentals: new evidence from real-time data, *Journal of International Money and Finance*

Eita J.H (2011). *Determinants of Stock Market Prices in Namibia*. Working Paper 209. Monash University.

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

Global Investor (2013). *Gilts and Bonds*. Retrieved from <http://www.incademy.com/courses/Gilts-and-bonds/Factors-which-affect-bond-prices/10/1067/10002>

Goldberg, L. & Leonard, D. (2003). What Moves Sovereign Bond Markets? The Effects of Economic News on U.S. and German Yields. *Current Issues in Economics and Finance, Federal Reserve Bank of New York*, 9, 1-7

Hilscher J. & Nosbusch Y. (2010). Determinants of Sovereign Risk: Macroeconomic Fundamentals and the Pricing of Sovereign Debt. *Review of Finance* (14): 235–262.

Jahjah, S. & Peter J. M., (2003). *Exchange Rate Policy and Debt Crisis in Emerging Economies*. IMF Working Paper 03/60.

Jahjah, S., Wei, B. & Yue, V.Z. (2012). *Exchange Rate Policy and Sovereign Bond Spreads in Developing Countries*. International Finance Discussion Papers

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 portfolio frontier, *Journal of Financial and Quantitative Analysis* 7 (1973), 1851–1872.

Mohan J. R. (2009). *International Business*. Oxford University Press, New Delhi and New York
NSE (2011). NSE Handbook 2011.

Obstfeld, M., & Kenneth R., (1995). Exchange rate dynamics redux, *Journal of Political Economy* 103, 624-660

Parsley, D. C., & Wei, S. (2001). Explaining the border effect: the role of exchange rate variability, shipping costs and geography, *Journal of International Economics* 55, 87-105

Riley, N. (2003, September 03). *Reduce your risk with ICAPM* . Retrieved from <http://www.investopedia.com/articles/financial-theory/09/ICAPM-and-CAPM.asp>

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