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The Domestic Bond Market and the Development of the Nigerian Capital Market: An Empirical Analysis

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Abstract
The fixed income security (bond) market is an important segment of the capital market in market economies. Its importance lies in the fact that it provides long term investment opportunity for the private investors and long term financing for firms at low cost. Governments use it as a low cost financing instrument for deficit budget. Also the domestic bond market is a source of huge liquidity in the financial market which eventually expands the size of the domestic capital market. Theory has it that, a combination of domestic and foreign participation in the domestic debt market generates liquidity, and lowers the national yield curve. This paper examines these theoretical assertions and relations as it applies to the Nigerian capital market. Using data from the Central Bank of Nigeria, we use the methodology of applied financial econometrics to analyse the various relationships.
Keywords: Domestic bond market, bond market liquidity, capital market size, national yield curve, Nigeria Eurobond, capital market, foreign participation.

Introduction

This paper essentially examines how the growth of domestic bond market and foreign participation in the same market function to impact the development and growth of the Nigeria capital market and enhance financial stability.Peiris (2010) noted, "A vibrant and deep local currency domestic bond market promotes financial stability and economic growth". Also a good and functioning domestic bond market is useful in the conduct of monetary policy. A functioning and stable domestic bond market in Nigeria is important for the West African region, Nigeria being the largest economy in the sub-region. Until 2003, Nigeria could not participate in the international debt market, but following the debt forgiveness by the Paris and London Clubs, in the Fourth Quarter of 2005, confidence returned to Sovereign Nigeria State to re-enter the International Financial capital markets to raise debt in order to finance her capital projects. In 2003 through the Debt Management Office (DMO) established in 2000, Nigeria issued her first Sovereign (FGN) debt in a 20 year domestic bond. Between 2008 and 2010, the Debt Management Office concluded the sale of eight corporate bonds worth N92.8 billion in the domestic capital market. The Nigerian domestic fixed income market had thereafter remained vibrant with high foreign participation. Table 1A below shows the growth of the Sovereign bond market between 2005 and 2010. The Sub-National and Corporate categories have also shown growth.

Table 1A: FGN Bonds Primary Market Issuance 2005 – 2010 (- billion)

Year	Offer	Subscription	Allotment
2005	140	326.362	178.275
2006	245	612.979	282.083
2007	592	1,167.597	592.000
2008	515	845.951	491.961
2009	694	1,340.891	726.500
2010	1,073	2,267.760	1,244.44

Source: BUSINESSDAY 2011, June 13.

The activities of DMO in the domestic bond market have effectively led to the emergency of a sovereign yield curve which was extended from 10 to 20 years when the DMO in 2008 issued the 20 year Federal Government Bonds (GFB) for the first time. Not only has the DMO raised the profile of the Nigeria domestic bond market, it has also debunked in the international bond market when on 21 January 2011; it issued the $500m 10 year 6.75% Nigeria Eurobond with maturity in January 2016.

International participation in the domestic bond market plays several important roles in the development of

emerging market economy domestic bond market. Foreign participation in the domestic bond market is an important source of liquidity to the domestic capital market which in turn helps to lower the national yield curve. Generally local private and institutional investors in the domestic bond market are typically buy and hold investors, while foreign investors are more likely to trade the instrument thereby increasing the liquidity of the market. Foreign participation also helps in internationalizing emerging market economies(EME) domestic capital markets. It attracts private sector borrowing away from the domestic market. For instance G.T Bank in January 2011 raised a $500 Eurobond 10 year 7.9 percent coupon in the international capital market away from the domestic market. Despite arguably the supportive role played by foreign participation in domestic bond market in the development of domestic bond markets, there are a number of downside risks to excessive foreign participation. Excessive foreign presence in the domestic capital market sometimes could result in greater volatility in local bond markets in the event of financial crises and instability. The Russian 1998 and Asian Tigers financial crisis of the same year are cases in point. The international bond market is subdivided into three market segments – the domestic bond market – debt sold domestically, foreign bond market which "is a debt security issued in a domestic market by a non-resident corporation (Batten, Hogan, and Szilagyi 2009). Finally, the Eurobond market underwritten by multinational syndicates of banks and placed in countries other than the one in whose currency it is issued.

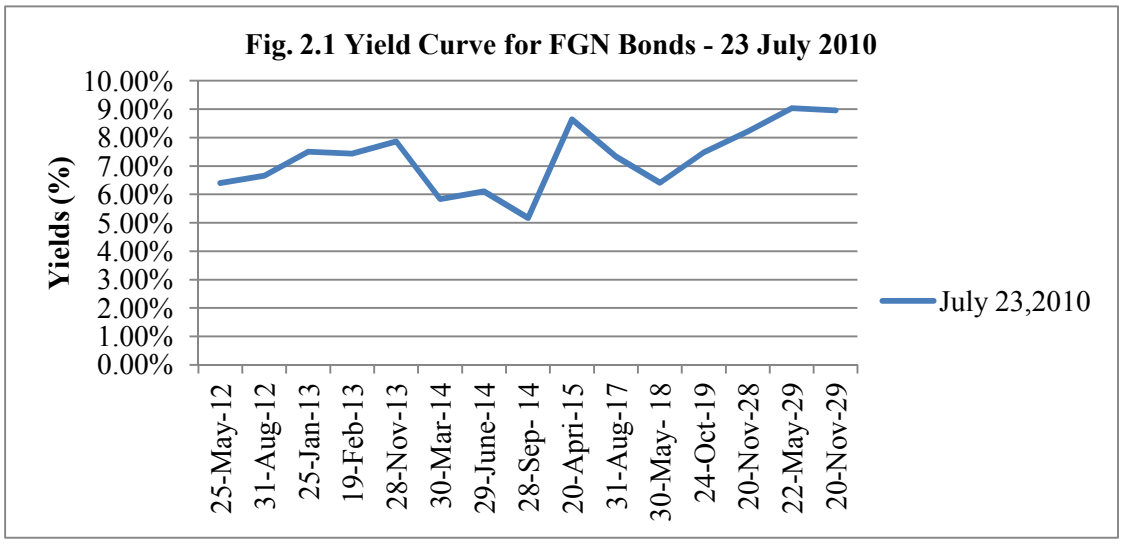
This paper is set to examine how Nigeria deficit budget could be financed through the country's participation in both the domestic and international debt markets. It also examines how foreign participations in the domestic bond market could contribute to the development of the Nigerian capital market through the provision of liquidity in the domestic market. The rapid growth of bond issues has placed the bond market as an important factor in the development of the Nigerian capital market. Has the domestic bond market in anyway helped the development of the Nigerian capital market? These issues form the focus of this paper. Section one is the introduction, section two treats the theoretical and empirical review of existing literature. Methodology is undertaken in section three. Section four treats detail of the work, while section five is the summary of findings, conclusion and recommendation.

2.1 The Nigerian Bond Market Review – the Primary Market

The Nigerian primary bond market as a subunit of the Nigerian capital market is relatively small when compared to similar markets in the developed economies. Nevertheless the market has experienced rapid transformation. Market capitalization was N3.02 trillion as at May 2011 compared to N108.5bnas at 2009. In September 2011, the total market turnover of the Nigerian domestic bond market is given as N4.55 trillion though much less than the turnovers in similar markets of the developed economies. The domestic bond market grew by 106 percent to N4.55 trillion between January 2010 and April 2011. Though it more than tripled the level issued in 2009, the supply of FGN Bonds has lagged sharply behind in relation to the surging demand during the year. For instance, the Debt Management Office (DMO) offered a total of N396.50bn of FGN Bonds as at the end of first half of the year (HY1 2011). This is about 13.80 percent lower than, and contrasts with the N460bn offered in HY1 of 2010. (BUSINESSDAY, 2011, Sept. 01).

2.2 The Nigerian Bond Market Overview – the Secondary Market

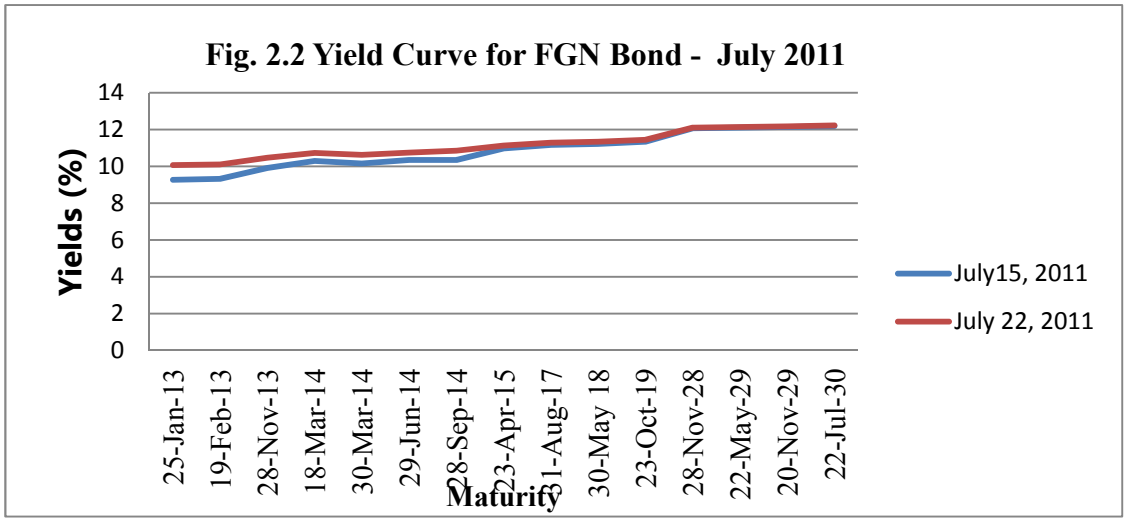
An active secondary market is important to the development of the domestic bond market. Until recent developments "Nigeria did not have a primary dealer/market for government bonds. Currently over the counter (OTC) market exists in the Nigerian bond market. Market capitalization stood at N3.02 (BUSINESSDAY, 2011 30 June). Market size grew from 3.93 billion units in 2007 to 13.75 billion units in 2010. In the past two years long term issues characterised the Nigerian bond market, accounting for some 43 percent of total issues in 2010 from 23 percent in 2008. By the second half of 2010, the Yield Curve, a measure of the return on fixed income securities and the secondary bond market performance was fairly low in the Nigerian domestic bond market. Theory says there is an inverse relation between bond yield curve and interest rate, for example inflation and price of bonds. The yield curve is simply "a graph showing bond yields on the vertical axis and different maturities lengths of any type of debt instrument such as government bonds and notes on the horizontal axis". Rising interest rates results in lower prices of bonds especially the long tenors fixed income securities. One explanation is that bond investors are exposed to higher interest rate fluctuations; the longer they hold a bond into an uncertain future. This higher rate of return when used to discount a bond's cash flow reduces the price (Pandey, 2008).Figure 2.1 below represents the



Source: Drawn by the Authors

National yield curve of selected FGN Bonds in the second quarter of 2010 in the Nigerian domestic bond market. Consistent with theory, average yields on longer tenor bonds, for instance, the 6TH FGN SERIES 5, 20 years with maturity in 2029 has an average yield of 8.96 percent. Compare this with the relatively shorter tenor 6TH FGN SERIES 4, 10 years with maturity in 2019 with an average yield of 7.84 percent. Longer tenor bonds with higher yields were better bargains. Modified durations for longer tenor bonds are also higher for shorter tenor bonds in 2010. For instance, the longer tenor 6TH FGN SERIES 5, 20 years with maturity in 2029 has duration of 9.28. This is in contrast with the shorter tenor 6TH FGN SERIES 4, 10 years maturing 2019.

In 2011, the domestic bond market outlook was slightly different compared with the same period of 2010. Total subscription in the market stood at N861.11 billion down by some 18.05% from the N1, 057.72 billion subscribed during the same second quarter of 2010. Beginning second quarter of 2011, the yield curve in the Nigerian domestic bond market showed a flattening from the short end of the curve. In the third quarter, (July – September) due to a hike in the monetary policy rate (MPR) by 25bps to 6.25 percent by the Central Bank of Nigeria (CBN) yields began to edge higher. This is reflected in the behaviour of the yield curves for the middle and end of July 2011 which slopes upwards as shown in the figure 2.2 below. Yields on both long and short tenor bonds tied up as they progress. The yield curve in figure 2.2 below is an indication of a flattened yield curve following the hike in MPR rate to slow possible inflationary trend in the economy.



Source: Drawn by the Authors

As in July, yields across board went up following a hike in Monetary Policy Rate (MPR) by 50 basis points to 9.25 percent on September 19 (BUSINESSDAY, 2011 20 October). Yields on bonds with shorter tenors such as those with maturity in 2014 and 2015 shoot up reflecting the hike in MPR by the CBN. However the longer tenor bonds – with maturities in 2018, 2019, 2028 and 2029 fell or flattened as fear or inflation recedes. This is shown

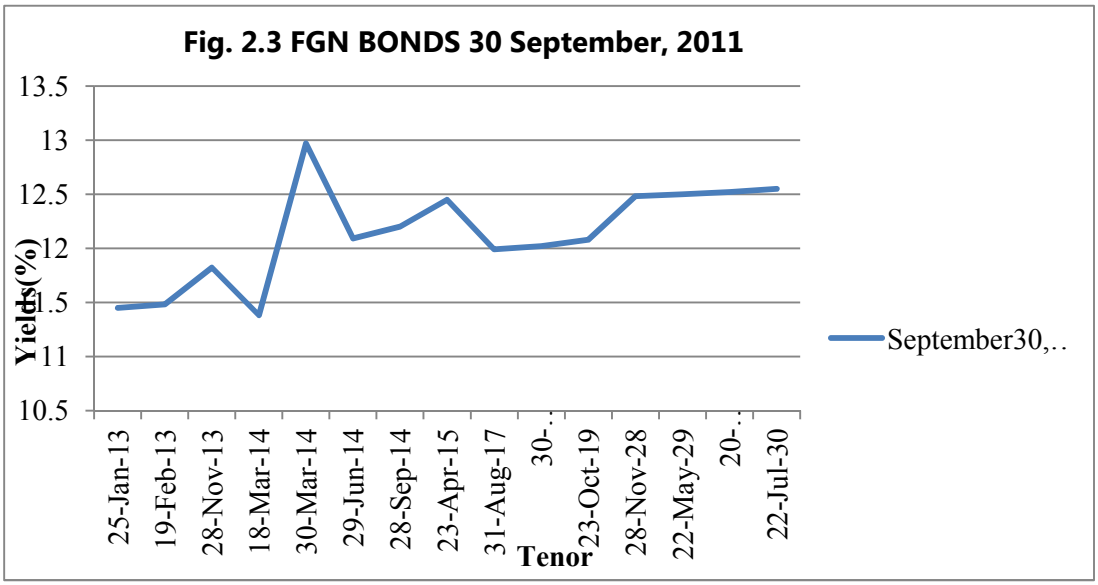
in figure 2.3 below. The indication is that changes in yields were lower in the longer tenor bonds compared with the shorter bonds.

The inverted yield curve (figure 2.3) below on September 30 in the domestic bond market also reflects the substantial inflow of liquidity into the market in the same month. The Federation Account Allocation committee (FAAC) (2011 September 16 – 23, released a total of sum N607.023bn as statutory allocation to the three tiers of government. The inflow of liquidity implies that spot rate interest rate will decline accordingly.

Table 2.1 FGN Bond MTM Prices as at September 30, 2011

S/N	Description	Maturity	TTM (Years)	Price (N)	Yields (%)
1	9.45% FGN JAN 2013	25-Jan-13	1.32	97.59	11.45
2	5.50% FGN FEB 2013	19-Feb-13	1.39	92.52	11.48
3	10.50% FGN NOV 2013	28-Nov-13	2.18	97.52	11.82
4	10.50% FGN NOV 2014	18-Mar-14	2.48	98.14	11.38
5	10.75% FGN MAR 2014	30-Mar-14	2.52	97.43	12.97
6	9.20.% FGN JUN 2014	29-Jun-14	2.77	93.38	12.09
7	9.25% FGN SEP2014	28-Sep-14	3.02	92.79	12.20
8	4.00% FGN APR 2015	23-Apr-15	3.58	76.26	12.45
9	9.35% FGN AUG 2017	31-Aug-17	5.94	89.02	11.99
10	10.70% FGN MAY 2018	30-May 18	6.69	94.02	12.02
11	7.00% FGN OCT 2019	23-Oct-19	8.09	74.27	12.08
12	15.00% FGN NOV 2028	28-Nov-28	17.19	117.6	12.48
13	12.49% FGN MAY 2029	22-May-29	17.67	99.87	12.50
14	8.50% FGN NOV 2029	20-Nov-29	18.17	71.4	12.52
15	10.00% FGN JUL 2023	22-Jul-30	18.84	81.68	12.55

Source: BUSINESSDAY 20 October 2011



Source: Drawn from table 2.1 by the Authors

Foreign Participation in the Nigerian Bond Market

Nigeria has an active emerging economy bond market (EEBM) which offers profitable investment opportunities for foreign capital market investors. The Government of Nigeria recently lifted the Certificate of Capital

Importation (hereafter CCI) which earlier hindered foreign participation in the Nigerian bonds market.CCI specifies a one year holding period for foreign investors in Nigerian domestic capital markets before trading a debt instrument. Peiris(2010) and Daniel (2008), both agree that foreign participation in domestic bond market serves as catalyst to the development of domestic capital markets.

With an ever expanding fiscal deficit policy, Nigeria needs an active presence in both the domestic and international capital markets to finance public debt which currently stands at 4.3 percent of GDP as against 3.3 percent in the corresponding period of 2010. Together with loan syndication and issuance of international bonds in the 1990s, active participation in the bond market has been recognized as a new method in financing public debt in emerging market economies (Daniel 2008). Nwankwo, noted: "Trend in foreign participation in local emerging market economies bond markets by the Committee on Global Financial System (CFS) shows that although foreign investors account for a small share of total holdings of emerging markets – public and private domestic bonds share has been increasing over the past six years".

Nigeria on January 21, 2011 through the Debt Management Office (DMO) successfully issued a Eurobond USD500.00, 10-year 6.75 percent coupon maturing January8, 2012. The Bond which is intended mainly to set a bench mark for Nigeria signaled the country's participation in the international capital market[i]. Improved liquidity in the market is one important index of developed bond market. Bond market liquidity has to do with the ease with which securities are converted to cash. This is one of the major objectives of Nigeria Eurobond, "the aim of the 10 year bond is to set a benchmark in the global market for Nigeria rather than to raise fund" (BUSINESSDAY, 2011 30 June).

The bond which is listed on the London Stock Exchange is actively traded in the secondary Euromarkets – "an offshore capital market where borrowers and lenders meet because of its lower costs and lack of regulation" (Anonymous). Secondary market trading statistics indicate that the Nigerian Eurobond has since its issue, consistently traded below its coupon rate of 6.75% in Euromarkets until October 2011. Tables 3.1 and 3.2 below give the trading statistics for the Nigerian Eurobond in the secondary market in middle of September and October 2011.

Table 3.1 Weekly Summary Sept. 2011

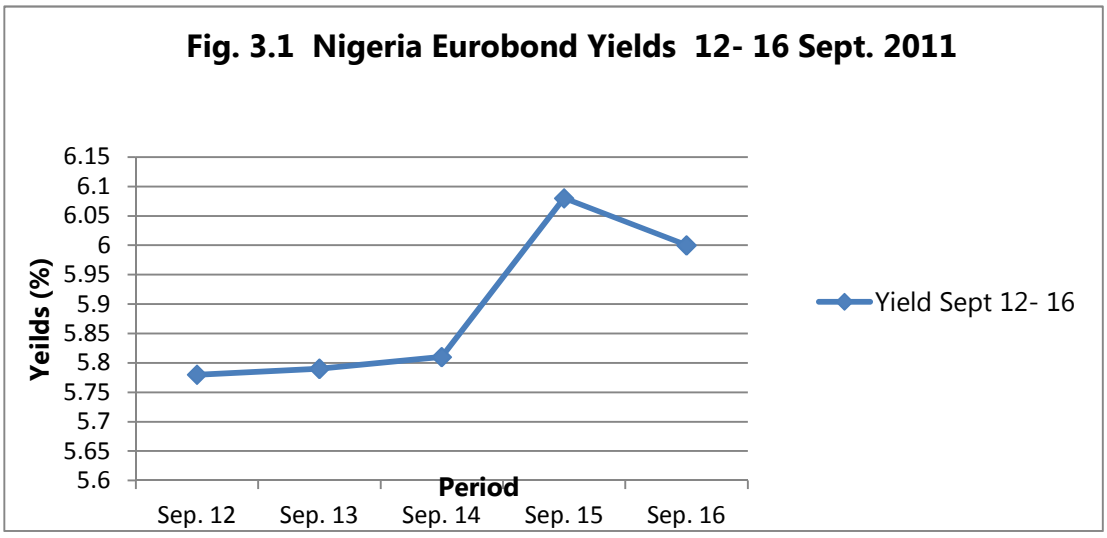
Date	Closing Price (US$)	Closing Yield (%)
12-Sep-11	106.86	5.78
13-Sep-11	106.81	5.79
14-Sep-11	106.67	5.81
15-Sep-11	106.66	6.08
16-Sep-11	105.00	6.00

Source: BUSINESSDAY 22 Sept. 2011

Table 3. 2 Weekly Summary Oct. 2011

Date	Closing Price (US$)	Closing Yield (%)
10-Oct-11	95.44	7.43
11-Oct-11	96.08	7.33
12-Oct-11	97.91	7.05
13-Oct-11	98.91	7.03
14-Oct-11	98.50	6.95

Source: BUSINESSDAY 27 Oct 2011



Source:Drawn by the Author based on Table 3.1

In mid-September 2011, the Nigeria Eurobond traded at a premium and its yield climbed steadily to close at 6.00. Figure 3.1 above is the yield curve for the bond for mid-September 2011. The down slopping part of the yield curve beginning 15th September was as a result of the slight decline in the flow of fund from the Emerging Market Dedicated Fund which affected activities in the bond market. The bond price went to its lowest at USD95.44 since listing.

3.0Research Methodology

The data for this study is from secondary materials on 2CDs obtained from the Central Bank of Nigeria (CBN), 2010 edition. Additional sources of material are published Journal articles related to this work and articles in the BUSINESSDAY and World Wide Web were reviewed to probe existing literature. We also used the methodologies of applied financial econometrics to model the relationships between the variables as explained below. When the different variables were tested for stationarity, they were found not to be i(0), for which reason the (OLS) model is discarded for the Auto Vector Regressive (AVR) model used to model the relationship between the variables applied used to model the relationship, but the series are first tested for Unit Root to ensure that the time series data are stationary. Capital market size **(CMKS)**is regressed on foreign participation to determine the relationship between the size of domestic bond market and foreign participation. Foreign participation **(FRNP)**is measured by data obtained from portfolio investment in the capital account in the balance of trade account between 1981 and 2009. Domestic participation**(DMP)** is approximated by domestic holdings of Federal government stock by domestic investors. Next capital market size is regressed on market liquidity**(ML)**. Market liquidity is measured by total value traded of domestic bond. This is used to determine it true effect on the domestic debt market growth.

Growth of the capital market (debt unit) is realized in two important indicators – *liquidity* and *market size.* Domestic Market Size **(DMS)**is measured by the annual capitalization of the debt market and liquidity by the yearly total value traded between 1981 and 2009, the period covered by this paper. Market capitalization is the total value of all listed government stock and debt/bond securities on the Nigerian stock exchange. The variables are (a) Domestic Market Size**(DMS)** – approximated by market capitalization to GDP (Onaolapo and Oluwafemi, 2010), (b) liquidity **(DML)**– approximated by value traded of all government stocks and debt/bond securities, and (c) Foreign participation approximated by portfolio investment under the capital account liability.

4. 0ModelingParticipation in Nigeria Domestic Bond Market

CMKG is regress on foreign and domestic participation in the domestic bond
market as parameters. The model (functional form)below is used to test the relationship.

CMKG =*f* (FRNP, DMTP)..... (1)

Where:

a. **CMKG = Capital Market Growth (the debt unit of the market)**
b. **FNRP = Foreign participation in the domestic debt market**
c. **DMTP = Domestic participation in the Domestic bond market**

such that the growth and development of the domestic capital (debt unit) market
depends on the level of foreign and domestic participations in the market respectively. To determine the separate effects of foreign **(FNRP)** and domestic participations **(DMTP)** on the growth and development of the domestic bond market, we formulate equation (2) to regress capital market growth on foreign **(FNRP)** and domestic participations**(DMPT).**

$CMKG = \alpha + \beta_1 FNRP + \beta_2 DMPT + U_1$..... (2)

Where α is the intercept, β_1 is the coefficient of FNRP and β_2 the coefficient of DMPT and U_1 the error term. Growth and development of the domestic capital (the bond unit) market is measured by:

I. **The liquidity level available in the domestic bond market**
II. **The market size**

Such that domestic capital (bond) market growth is now a function of:

CMKG = *f* (DMLT, MKTS)..... (3)

Where:

(a) CMKG = Capital market Growth (The debt unit of the market)
(b) DMLT = Capital market liquidity as measured by the value traded
(c) DMKS = Capital market size – measured by market capitalization

The underlying assumption is that foreign participation (**FNRP**) increases both market liquidity and market size - growth. Domestic bond market liquidity**(DMLT)**is measured by the total value of trade of government

stocks/debt. How has foreign participation contributed to the liquidity **(DMLT)**level and market size **(MKTS)**market capitalization in the Nigeria domestic bond market? Substituting **DMLT** in equation (2) above, we have:

$$DMLT = \alpha + \beta_1 FNRP + U_t \quad \text{.....(4)}$$

$$DMKS = \alpha + \beta_1 FNRP + U_t \quad \text{.....(5)}$$

While equation (4) measures the direct relationship between (**FNRP)** and domestic bond market liquidity (**DMLT)**, equation (5) measures the effect of the foreign **(FRNP)** participation on the growth and development of the domestic bond market. Same as:

$$DMLT = \alpha + \beta_1 DMTP + U_t \quad \text{..... (6)}$$

$$DMKS = \alpha + \beta_1 DMTP + U_t \quad \text{.....(7)}$$

Such that the overall effect of both domestic and foreign participations on the domestic bond market liquidity and market growth – size is given by:

$$CMKG = \alpha + \beta_1 DMLT + \beta_2 DMKS + U_t \quad \text{.....(8)}$$

4.0 ANALYSIS

Testing for Unit Root (ADF with intercept).

The data are tested for unit root using ADF. The ADF test result in Table 4.1 below shows that all four series are integrated either at level 1[0] or first difference 1[1].

Table 4.1: Augmented Dickey Fuller (ARDF) test at the 5% significant level.

Variables	level	1st Difference	Order of integration
DMTP	-3.9000	-5.3174	1[0]
DMLT	-5.3952	-12.3692	1[0]
DMKS	-0.6225	-4.4443	1[1]
FNRP	-3.0539	-5.3163	1[0]
Critical Value = 5%	-2.9762	-2.9810	

Source: Extracted from E-View ADF) Unit root test.

Hypothesis Testing

The null hypothesis is embedded in equations (2) (4), (5), (6) and (7). These equations will be tested following the one sided test statement:

H_o= There is no significant relationship between foreign participation (FRNP), and liquidity **(DMLT)**and growth in the domestic bond market.

H_1 = There is a significant relationship between foreign participation (FRNP) and growth of the domestic bond market.

Table 4.2 MODEL 2: $CMKG = \alpha + \beta_1 FNRP + \beta_2 DMPT + U_1$

VARIABLE	α	β_1	B_2	R	R^2	T
DMKS(CMKG)		-2.8935	2.0974	.890	.881	24.719
Constant (C)	9151.151					(.2347)

Source: Extracted from E-View using the Fully Modified least Square (FMOLS)

The parameter coefficient estimates in model 2, Table4.2 give sufficient evidence that a significant relationship exists between DMPT that is domestic bond market participation and growth in the size of the bond market. However there appears to be a negative relationship between foreign participation (FNRP) and growth in the size of the Nigerian domestic debt market. Using the Phillips-Perron method we examine the error term for statitionarity at 1(0). The result of the test is shown in Table 4.3 above.

Table 4.3 Phillips-Ouliaris Residual test for Unit Root

	Value	Prob.
Phillips-Oulliarias *tau-statistic*	-9.4198	0.0000
Phillips-Oulliarias *z-statistic*	-46,8687	0.0000

Source: Extracted from E-View: Phillips-Ouliaris residual test

The Phillips-Ouliaris tests overwhelmingly reject the null hypothesis of no cointegration (unit root in the residuals) even at the 1% significance level. The alternative hypothesis of cointegration in the series (no unit root in the residual) is accepted. With this result, we conclude that there is a long relationship between growth of the Nigerian domestic bond market and domestic participation. However there appears to be a negative relationship between foreign participation in Nigerian domestic bond market.

Next we run a regression to see the relationship that exists between the liquidity in the domestic bond market (DMLT) and foreign participation (FRNP). We use the simple ordinary least square (OLS) method since both

series have been tested and found to be 1(0) see Table 4.1 above. This assures that both series are stationary at level and could be tested using the ordinary least square method

Table 4.4

MODEL 4: DMLT = α+ β_1FNRP+ U_t

VARIABLE	α	β_1	*R*	R^2	F	T
DMLT	1838	-2.1239	0.0129	-0.0236	0.353	2.3048

Source: Extracted from E-View OLS

The test result above indicates little relationship between foreign participation in domestic bond market and liquidity in the domestic bond market. The F value is small and the R^2 also has very little explanatory power. This result contradicts theory – that foreign participation in the domestic bond market increases liquidity and lower the bond yield curve.

Table 4.5

MODEL 6: DMLT = α+ β_1DMTP+ U_t

VARIABLE	α	β_1	*R*	R^2	F	T
DMLT	194999	-5.8717	0.01559	-0.02086	0.427	2.248

Source: Extracted from E-View OLS

The test result in Table 4.5 (Model 6) shows little or none relationship between domestic market participation (DMTP) in domestic bond market and liquidity in the domestic bond market. The F value though indicates an average goodness of fit; the R^2 has very little explanatory power. Model 4 in table 4.4 contradicts theory – that foreign participation in the domestic bond market increases liquidity and lower the bond yield curve.

5.1 SUMMARY

The various tests conducted produce mix results. Foreign participation in the domestic bond market contributes very little or nothing to the liquidity in the Nigeria domestic bond market, and does not affect national yield curve. This finding is important as it contradicts theory. We should treat this finding with caution though. First the data used may have been corrupt given the manner data are collated in Nigeria. Secondly, until 1 July 2011, the Certificate of Capital Importation (CCI) hindered foreign participation in the Nigerian bonds market. CCI may have hindered foreign investment in the Nigerian market.

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