SENSITIVITY OF CAPITAL MARKET DEVELOPMENT TO PUBLIC DEBT IN NIGERIA

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ABSTRACT

This article investigated the sensitivity of capital market development to public debt in Nigeria using descriptive statistic, regression analysis, and the Engle-Granger co integration techniques for the period ranging from 1981 to 2014. The estimates from the descriptive analysis showed that both the market capitalization and public debt series were not normally distributed at 5% significance level. The ADF unit root test showed that the market capitalization and public debt series were integrated of order one (i.e., I (1)). The results from the regression model provide evidence to show that capital market development is not sensitive to domestic debt at any conventional level, but it is sensitive to external debt at 10% significance level. The estimates of the Engle-Granger co integration tests show that capital market development is not co integrated with public debt. It is recommended that capital market and debt management authorities should formulate policies will enhance linkage between the markets.

Keywords: capital market development, public debt, Nigeria

INTRODUCTION

Capital market can be defined as the section of the financial system that is responsible for efficiently channeling funds from the surplus to the deficit economic units on a long-term basis (Onoh, 2002). It is a network of specialized financial institution, series of mechanism, process and infrastructure, that, in various ways facilitates the bringing together of suppliers and users of medium to long-term capital for investment in economic development project. The market is the source from which companies and industries raise funds for expansion and modernization, and also avails governments opportunity to borrow on a long-term basis for economic and social development purposes. It is a major driving force for economic development and growth in many countries. Capital market as a network of institutions and individuals is made up of regulators and operators who together bring suppliers and users of capital and facilitate the smooth operation of the market. The capital market therefore contributes to the economic growth and development of emerging and developed economies (Al-faki, 2006; Amu *et al.*, 2015; Onoh, 2002).

On the other hand, Public debt is all the money owed at a given time by any level of the government. It encompasses debt owed by the federal government, state government and local government. Public debt accumulates over time when government spends more than it earns in revenue. It increases as the government engages in more deficit financing. Public debt is divided into domestic and external debts. External debt is money owed by the government to foreign lenders, where as domestic debt is money owed to lenders within the country. The public debt in Nigeria as per December 31, 2013 was $64.509,95 million, which comprises of $8.821,90 million external debt stock for federal and state governments, $45.722,41 million domestic debt stock for federal government, and $9.965,64 million domestic debt stock for states. By 2015, the total debt

stock has increased slightly to $65.428,53 million, which is made up of $10.718,43 million external debt stock for federal and state governments, $44.857,85 million domestic debt stock for federal government, and $9.852,25 million domestic debt stock for states.

Similar to many developing frontier capital markets, the Nigerian capital market is shallow. Issues of public debt management and capital market underdevelopment are linked. The underdevelopment of capital market results in institutional investors limiting the amount and maturity of funding available to the government locally and can substantially increase the rollover and currency risks in managing public debt (Shah *et al.*, 2007). Similarly, poor debt management practices results in fragmented issuance of debt instruments and a lack of a liquid benchmark yield curve makes it difficult for all borrowers to obtain long-term financing, as well as undermine ability of institutional investors to apply appropriate risk management.

Moreover, many scholars have documented that excessive public debt may discourage investment. For example, Akujuobi (2012) observes that borrowing heavily from internal and external sources to fund different sectors of Nigerian economy with doubtful corresponding gains is not sustainable. Such unsustainable public debt, as Emenike (2015) stated that a potential threat to investment in physical assets and foreign investment. High level of external debt lowers investors' expectations on investment returns, with the possibility of progressively more distorted taxes by the government for debt repayment. Thus, high level of public debt discourages investment (both domestic and foreign) as well as slows down accumulation of physical capital.

There are so many empirical studies had analysed the linkage between public debt and economic development (Anyanwu, 1994; Akujuobi, 2012; Emmanuel, 2012; Erhieyovwe & Onovwoakpoma, 2013; Udoka & Anyingang, 2010). Based on the previous research, the author suggest there should be a research to examine the influence of public debt on capital market. Many other studies have also examined impact of capital market development and economic growth (Amu *et al.*, 2015; Ewah *et al.*, 2009; Osuala *et al.*, 2013). Therefore, there is a need to provide empirical evidence on the sensitivity of capital market development to domestic and external debt in Nigeria, especially now that the government revenue from crude oil is dwindling.

Nigeria's external indebtedness, according to Debt Management Office (undated), started before independence. However, the value of the debt was small until 1978, as they were mainly long-term loans from multilateral sources and from Nigeria's major trading partners. Because the loans were obtained at very low interest rates, they were a burden on the economy. In addition, Nigeria had sufficient oil revenue resulting from the oil boom of 1973-1976.

With the decline in oil revenue receipt resulting from a fall in oil prices during the 1977-78 periods,

Nigeria had to raise the first large-scale loan (over $1,0 billion) from the international capital market. The loan, which had interest rate moratorium of three years, was used to fund infrastructural facilities, which failed to directly earn returns for its repayment.

The rebound of international crude oil prices from 1979 resulted in a wrong feeling that the economy was rich. As a result, some deflationary policies aimed at addressing the effects of oil decline in 1978 were removed. This led to a consumption style that is based on imported goods, and was aggravated and sustained by the import substitution industrialization policy that relied on importation of raw materials, machines and an overvalued exchange rate policy.

With the end of oil boom and fall of oil prices in 1982, Nigerian economy started suffering as the consumption style that adopted during high oil prices could not be maintained with as a result of falling foreign exchange earnings. Instead of making policies that revive falling foreign exchange receipt, the governments started heavy external borrowings from international fund market.

There were also excess loan-able funds in the international capital market at that period, which led the international commercial banks with idle funds to grant credit facilities to developing countries in the guise of helping their economic development. Under the circumstance, there was pressure on various sectors of the Nigerian economy resulting in significant imbalances in government finance, weak foreign exchange reserves, deficits in balance of payments, and mounting trade arrears. These resulted in refinancing of letters of credit facilities to the tune of $2,1 billion. With the continued increase in trade arrears, Nigeria could not service her external debts.

Consequently, the debt stock increased astronomically, even without contracting new loans. The value Nigeria external debt was less than US$0,8 billion in 1977. But from 1978, it started to grow rapidly, from US$5,09 billion in 1978 to U$8,855 billion in 1980 and to nearly US$19 billion in 1985. By then the external debt stock had deteriorated enormously as a result of defaulting to service its external debt service. This resulted in growing arrears and very high debt stock in relation to the resources available in the country. In 1985, the amount of debt service was about 33% of the total export earnings (i.e., a little above US$4 billion). By the end of 2001, Nigeria external debt has grown to US$28,35 billion, which was about 153,9 % of export earnings and 59,4% of the GDP.

By the end of 2002, the total external debt had increased to US$30,99 billion. At the end of 2004, total external debt outstanding had risen to US$35,94 billion from US$32,92 billion in December 2003, which was an increase of 9,20 percent or US$3,03 billion. This increase in the debt stock was the result of sustained depreciation of US dollar against other currencies in which the external debts were contracted and the interest on additional payment arrears that have accumulated.

The management of domestic debt in Nigeria,

before the establishment of the Debt Management Office (DMO) in 2002, was responsibility of the Central Bank of Nigeria (CBN) through issue of federal government debt instruments, which include treasury bonds, treasury certificates, treasury bills, federal government development stocks, etc. These instruments exclude suppliers' credit owed by the government, contractors' debts, contingent liabilities, which are loans that were guaranteed by the Nigeria government, and inter-agency debt.

Domestic debt of Nigeria at the end of 2004, according to DMO (undated), stood at ₦1.370,32 billion, a little above ₦1.329,72 billion at the end of 2003. The increase of ₦40,63 billion or 3,1 percent in 2004 over the 2003 figure is the least annual growth in the domestic debt for eight years, which had averaged annual 22% growth for 1997-2003 periods, and peaked at 50% growth in 1998. Domestic debt increased more than fourfold between 1995 and 2003. The increase of domestic debt in 2004 was made up of new issues of treasury bills valued at ₦46,52 billion, which was partly offset by repayments of treasury bonds and federal government development stocks valued at ₦5,67 billion and ₦0,22 billion, respectively.

The treasury bills have remained the dominant domestic debt instrument in Nigeria. In 2003, for example, it accounted 64% of the total domestic debt. The second dominating debt domestic debt instrument is the treasury bonds, which was 31%.

The existence of Nigerian capital market effectively started with the Lagos Stock Exchange which was established in 1960 and began actual trading in 1961. The Lagos Stock Exchange was renamed Nigeria Stock Exchange (NSE) in 1977 as a result of recommendations given by Government Financial System Review Committee in 1976. In addition to the Lagos trading floor (which is the head office), the NSE has other trading floors in Port Harcourt and Kaduna in 1980 and has since increased number of functional trading floors to include Kano, Onitsha, Benin, Uyo, Yola, Ibadan, Abuja, the latest being the Abeokuta, Bauchi and Owerri branches (Emenike, 2009).

The Nigerian capital market is structured into two: the NSE and the Abuja Securities and Commodities Exchange (ASCE). While the NSE trades in financial assets such as shares, bond, funds (mortgage loans, project loans, etc), the ASCE trades commodities and their derivatives. The instruments traded in ASCE include, cotton, palm produce, cassava, ginger, soybeans, and coffee, others are gum arabic, sesame seeds, sorghum, cowpea, cocoa, and maize. An important feature of the ASCE, according to Nnanna *et al.* (2004) is that the commodities are not physically traded on the exchange but rather traded in pits and as such the different commodities are traded in different pits. The Nigerian commodity market is however developing.

The NSE is divided into the primary and secondary markets. The primary market is the segment of the NSE where funds are raised directly by investors from individuals and corporate organizations. In contrast, the secondary market is market for existing securities.

In line with global developments, the NSE changed from call-over system of trading in securities to automated trading system in 1998. Hence, the NSE is a fully automated exchange with on-line floor trading of securities. The floor trading is being replaced with a remote trading system, which would allow stockbrokers to execute stock trades from their offices (Emenike, 2009). Remote trading requires a good level of information technology, which many operators have attained.

Securities clearing and settlement is completed electronically through Central Securities Clearing System (CSCS). The CSCS is the Central Securities Depository (CSD) for the Nigerian capital market. It was incorporated on July 29, 1992, declared open on April 8, 1997 and started operation on April 14, 1997 (NSE, July 2007). The CSCS started with T + 5 settlement cycle in 1997, but operates a T + 3 cycle from March 1, 2000. CSCS has had a considerable positive impact on liquidity in the market.

The operator of the Nigerian capital market, according to Onoh (2002) and Nnanna *et al.*, (2004), include brokers/dealers, issuing houses, registrars, underwriters, trustees, portfolio/ fund managers, and reporting accountants, that provide various services for the investors and borrowers in the capital market.

The major regulators of the Nigerian capital market include Federal Ministry of Finance (FMF), Central Bank of Nigeria (CBN), and Securities and Exchange Commission (SEC).

The aim of this study therefore is to investigate the sensitivity of capital market development to public debt in Nigeria. Specifically the study intend to ascertain the extent (if any) to which domestic and external debts influence capital market development. The finding of this study is important to investors, capital market regulators, debt management agency and academia. The investors for example will want to know the impact of changes in domestic or external debts, or even both of them on their investment returns. Such information will help them to make investment decision, especially during periods of rising government deficit. The government will also benefit from this study. The finding will help the government to adjust her borrowing in order not to harm the capital market. This article will also contribute to existing literature on sensitivity of capital market development to public debt in Nigeria.

METHODS

In order to empirically examine the sensitivity of capital market development to public debt in Nigeria, descriptive analysis and regression analysis were applied. Descriptive analysis is used to present summary of the important statistics in a series. The descriptive analysis in this study entail presentation

of time series graphs of the variables as well as estimation of skewness, kurtosis, standard deviation, mean, and Jarque-Bera statistic for the level and return series of capital market and public debt series. The mean provides information on the expectation of the capital market and economic development series, whereas the standard deviation shows dispersion of the series from their expectation. The kurtosis and the skewness present insight into distributional symmetric patterns of the series.

The regression analysis, on the other hand, was estimated using Ordinary Least Square (OLS) method. The OLS enables the measure of the impact of explanatory variable(s) (X) on the explained variable (Y). It is specified as follows:

$$MCAP_t = f(DD_t, ED_t) \qquad (1)$$

$$MCAP_t = \delta_0 + \delta_1 DD_t + \delta_2 ED_t + \varepsilon_t \qquad (2)$$

Where *MCAP* is the explained variable and is the observations of yearly market capitalization of the NSE, DD_t denotes the yearly observations of Nigeria domestic debt, ED_t denotes the yearly observations of Nigeria external debt, δ_i are the slope coefficients that show sensitivity of capital market development to public debts, and ε_t is the residual term at time *t*. The *a priori* expectation of the slope coefficients are: $\delta_1 < 0, \ \delta_2 > 0$. These expectations hinges on the fact that domestic debt will crowd-out capital market investment whereas external debt will increase money supply and therefore boost capital market investment.

The data for this study are annual time series of NSE market capitalization, domestic debt and external debt. While the NSE capitalization proxy capital market development, domestic and external debts represent public debt. The public debt time series were collected from Central Bank of Nigeria statistical bulletin for various years and market capitalization series were collected from the Nigerian Stock Exchange. The study period ranges from 1981 to 2014.

RESULTS AND DISCUSSIONS

Figure 1 to 3 shows graph of the log-level and returns series of market capitalization, external debt and domestic debt, while Figure 4 shows comparative graph of the three series. Based on Figure 1 to 4, the level series are trending upward, but returns series have upward and downward spikes. The market capitalization, on the other hand, achieved the highest growth rate in 1994 and least in 1995. The level series appear non stationary but the return series appear stationary.

Descriptive statistics of the stock market capitalization, domestic debt and external debt series are shown in Table 1 below. From Table 1, the average market capitalization, domestic debt and external debt are 3402,22, 1546,75 and 1119,32 respectively for the sample period. However, the sample mean for return

market capitalization, domestic debt and external series are 24,61%, 19,87% and 19,85% respectively. The standard deviation is 29%, 15% and 52,6% for return series of market capitalization, domestic debt and external debt. The standard deviation shows external debt is the most dispersed from the average. This is not a surprise given the large fluctuations in the external debt. In 1981, for example, the external debt was ₦2,33 billion but rose to ₦2577 billion and ₦2695 in 1999 and 2005 respectively. By 2006, the external debt fall ₦45l billion as a result of a debt deal secured by the country. The kurtosis and skewness coefficients under normality assumption are 3 and 0 respectively. But the skewness coefficients for returns in market capitalization, domestic debt and external debt are 0,496, 0,424 and -1,018 respectively, and the kurtosis coefficients for returns market capitalization, domestic debt and external debt are 1,148, 0,159 and 6,566 respectively. The p-values show that the coefficient of the skewness for returns in market capitalization and domestic debt are zero but external debt is non-zero at 5% significance level. The p-values also show that market capitalization and domestic debts are not significant at 95% confidence level, suggesting that series are not leptokurtic. In the same vein, the Jarque-Bera statistics for both series suggest that may not be normally distributed at 5% significance level.

Table 2 shows the results of unit root test conducted on log-levels and return series of stock market capitalization, domestic debt and external debt series for the sample period. The importance of establishing the nature of stationarity of variables was first discovered by Yule (1926) and extended by Granger and Newbold (1974). They show that regression analysis between two non-stationary time series could lead to a spurious or nonsense result. Based on Table 2, the log-level series of stock market capitalization, domestic debt and external debt contain unit root but their return series have no unit root. These imply that the variables are integrated of the same order, and are stationary at first difference.

The results of the OLS regression model specified in equation (2) are presented in Table 3. In Table 3 showed that the one lag of Nigerian Stock Exchange Market Capitalization has positive and significant impact on capital market development; the coefficient of the lag one of the market capitalization is 0,772. The t-statistic and p-value stood at 8,224 and 0,000 respectively. This implies that the capital market development is highly sensitive to changes in market capitalization in Nigeria. Table 3 showed that domestic debt has positive but not statistically significant impact on capital market development. This is evident in the t-statistic and p-value, which stood at 0,123 and 0,902 respectively. Similar result is obtained the lag of the domestic debt. These imply that the capital market development is not sensitive to changes in domestic debt in Nigeria. Table 3 further shows that capital market development is sensitive to variations in public debts. This is glaring when one considers the t-statistic and p-value of external debt coefficient which are

-1,806 and 0,082 respectively. The one lag of external debt coefficient on the other hand has t-statistic and p-value of 0,183 and 0,061 respectively. These show that while external debt has negative impact on capital market development, its one lag has positive impact. Thus we can conclude with 90% confidence that capital market development is sensitive to external debt. Furthermore, the coefficient of determination (R^2) indicates that the model is good, whereas the Durbin-Watson coefficient (2,02) suggests that there is no first order serial correlation in the model.

This section presents the results of the long-run relationship between stock market and public debt. Table 4 shows the estimates of Engle-Granger co integration tests between stock market and public debt variables. Table 4 shows that stock market does not have long-run relationship with public debt at 5% significance level. This can be seen in the larger absolute value of 5% critical tau (-4,00) than the

computed tau value (-2,22). Given that the 5% critical tau value is greater in absolute value than our computed tau value, at all conventional significance levels, we accept the null hypothesis of no cointegration between capital market development and public debt in Nigeria. This finding is not surprising given the inactive bond market in Nigeria; particularly the secondary market for government securities which is supposed to provide the linkage between public debt and capital. Federal Government of Nigeria (FGN) Bonds, for example, was not issued until 2003. Paucity of long-term government securities may explain the lack of relationship between capital market and public debt since treasury bills which are issued on a regular basis are traded in the money market. Provision for secondary markets liquidity in FGN bonds by offering bid-ask quotes in all market conditions will enhance the relationship between public debt and capital market development.

Table 1 Descriptive Statistics

	Mean	Standard Deviation	Skewness	Kurtosis	J-B. Stat.
Level Series					
MCAP	3402,22	5601,34	1,617 (0,000)	1,416 (0,129)	17,666 (0,000)
DD	1546,75	2212,56	1,799 (0,000)	2,249 (0,016)	25,509 (0,000)
ED	1119,32	1363,86	1,569 (0,000)	1,430 (0,125)	16,856 (0,000)
Return Series					
DMCAP	0,2461	0,290	0,496 (0,266)	1,148 (0,227)	3,168 (0,205)
DDD	0,1987	0,150	0,424 (0,341)	0,159 (0,866)	1,028 (0,597)
DED	0,1985	0,526	-1,018 (0,022)	6,566 (0,000)	64,991 (0,000)

Note: DMCAP, DDD and DED are the return series of stoxk market capitalization, domestic debt, and external debt respectively. (.) is the p-value.

Table 2 Unit Root Test Result

	5% Critical t	Computed t		5% Critical t	Computed t
Log-level Series			**Return Series**		
MCAP	-2,949	-0,055	**DMCAP**	-2,952	-4,388**
DD	-2,949	-1,490	**DDD**	-2,952	-4,306**
ED	-2,952	-2,394	**DED**	-2,952	-4,443**

Table 3 Results of Regression Model

Variables	Coefficients	t-value	Prob.
Constant	-0,390	-1,322	0,196
MCAP{1}	0,772	8,224	0,000
DD	0,038	0,123	0,902
DD{1}	0,290	0,843	0,406
ED	-0,190	-1,806	0,082
ED{1}	0,183	1,950	0,061
$R^2 = 0,929,$	$F(5,27) = 824,457 [0,000],$	DW= 2,026	

Note: The variables are as defined in Table 1. {.} is the lag the variables

Table 4 Relationship
between Stock Marketand Public Debt

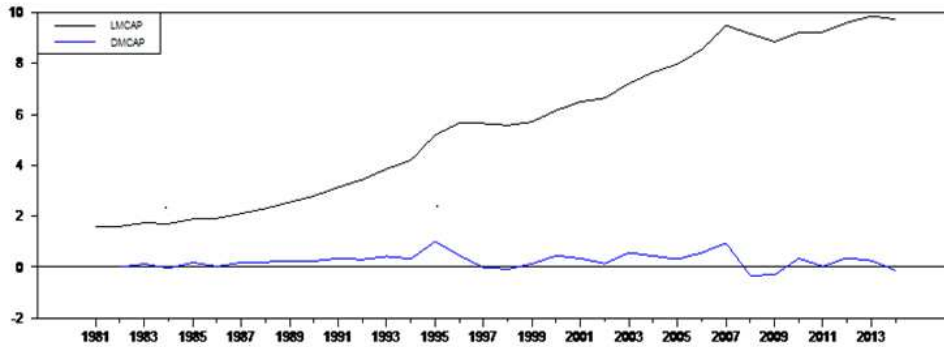| Engle-Granger Cointegration Test	
5% Critical	T-Stat
-4,000	-2,223

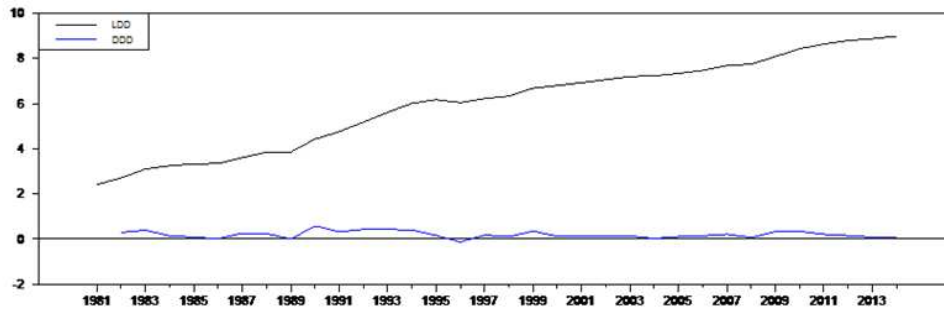Figure 1 Graph of Level and Return series of Stock Market Capitalization Series

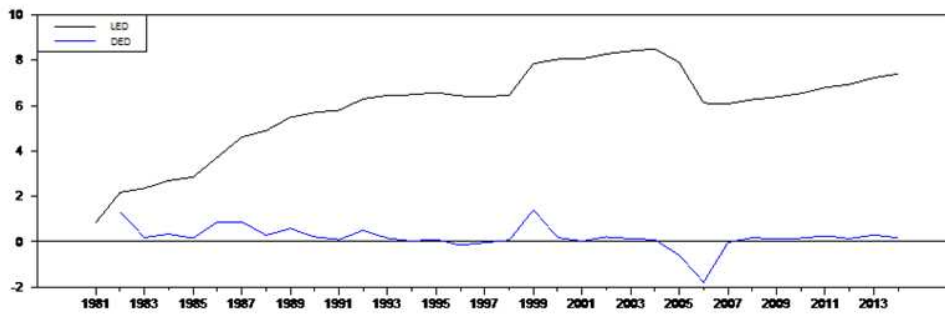
Figure 2 Graph of Level and Return series of Domestic Debt

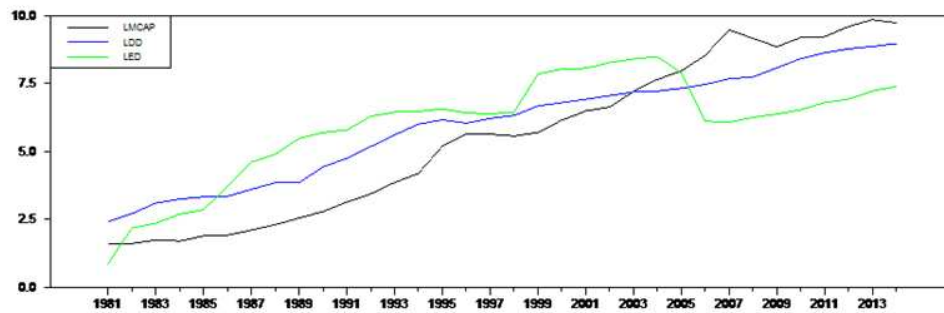Figure 3 Graph of Level and Return series of External Debt

Figure 4 Graphical Relationship between Capital market and Public Debt

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CONCLUSIONS

The major objective of this article is to investigate the sensitivity of stock market development to public debt in Nigeria by applying descriptive statistic, regression analysis and the Engle-Granger co integration techniques. The estimates from the descriptive analysis show that both the market capitalization and public debt series are not normally distributed at 5% significance level. The ADF unit root tests show that the market capitalization and public debt series are integrated of order one (i.e., I(1)). The results from the regression model provide evidence to show that the capital market development is not sensitive to domestic at any conventional level, but is sensitive to external debt at 10% significance level. The estimates of the Engle-Granger co integration tests show that capital market development is not co integrated with public debt. However, it is concluded that capital market development is not sensitive to public debt in Nigeria. Thus, it is recommended that capital market and debt management regulatory authorities should put in place strong institution that will create and maintain a healthy linkage between the two markets. They should also facilitate the development of a vibrant secondary bond market. This will enhance robust financial market in Nigeria.

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