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The Impacts of Financing Public Utility with in a Developing Economy (A Co-Integration Approach) Bonds

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Keywords: *bonds, finance, public utility, developing economy.*
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The Impacts of Financing Public Utility with Bonds in a Developing Economy (A Co-Integration Approach)

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Abstract- This study investigate Bond has a debt instruments' use to finance capital project by different levels of governments. Public utility such as roads, sea and air ports etc in any economy can be attributed or measured to an extent of the amount of money invested on bonds or the amount of Bond issued to finance public utility. However, Empirical evidences attest to the fact that bond is designed to finance capital projects in advance country but in the case a developing economy the reverse is the case hence making it difficult for business organizations to tap unto this financing window. This research work try to capture the effect of bonds on public utility using infrastructural development as a dependent variable in Nigeria with data from 1980 to 2011. The study applies the co-integration analysis and review that there is a positive linear relationship between bonds and infrastructural development. We also discover that bonds are statistical significant variables but inversely related to infrastructural development because the issue of bonds by governments in a developed economy has not been tied to a particular public utility.

Keywords: bonds, finance, public utility, developing economy.

I. Introduction

The Nigeria bond market is underdeveloped because the use of bond as means of raising long term capital has advanced. Bonds been a long term fixed income debt instrument for which the issuer agrees to repay the bondholder a stated sum of money at the maturity date. The bond market is special design to provide a mechanism for long term funding of public and private expenditures. Most government bonds in Nigeria are traded over-the-counter and so are bought majorly by financial institutions which hold them till maturity. Hence they do not have secondary market.

Public utilities been the basic systems and structures that a country or organization needs in order to work properly, for example roads, railways, airports, bridges, electricity, water supply, drainages etc. Because these facilities are of common use, they are taken up by government as her responsibility. Without public utilities in terms of infrastructure, business organizations will find it difficult to thrive because it is the driving force of the economy. Infrastructural facilities are capital intensive and so their provision makes a lot of financial demand on governments. Most often government revenue is inadequate to satisfy recurrent expenditure and leave reasonable proportion for capital expenditure. Public utilities are such long term project and ideally should be financed by long term capital. Bonds come handy to help augment government's reserve in funding public utilities.

In the Nigerian economy today, the total amount of bonds issued in the private sector is highly insignificant considering the size of Nigeria's economy; this is indeed small and is a reflection on the inefficiency of the Nigeria capital market to issue bonds that will be tied to a particular project. However, the Nigeria capital market has not created a model to monitor bonds finance to independent public utilities.

Businesses in Nigeria have been groaning in the dearth of infrastructural facilities which makes cost of operation very high and leans down profit margin. It invariably hinders development of small scale enterprises. Similarly, the Nigerian bond market is still at developmental stage given the predominance of over the counter trading and low participation of the private sector in issuance of bonds. Only in the recent years did governments and a few business organizations increase the amount and frequency of bond floating. Therefore, a strong debate as emerged between regulator of the bonds market and the general public as to the impact of bonds finance to public utilities in Nigeria. Therefore, the concern of this study is to specify a model that shows the relationship between public utilities and bonds. Against this backdrop, the purpose of this study is to empirically examine the issuance of bond as a source of finance to public utilities in Nigeria.

II. Literature Review

Opinion differs among experts in finance as to what finance instrument is adequate for the financing of public utility in Nigeria but they all agree that it is an age long issue for which there do not seem to be any consensus in sight. Thus as noted by Ideji 2010, the use

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of bond to finance public utility has a long history. It is in fact, almost as old as the origin of bond.

Bonds are use for financing of long term projects. This reduces the likelihood of insufficient fund for financing capital project by government or corporate entities. Public utilities such as roads, electricity, bridges, sea and airports, if adequately financed with the appropriate finance instruments will bring about economic growth and development. The perception is that the more bonds issue the more funds are available for investment in public utilities and real economic sector, and by extension, the higher the economic growth and development. The importance of bond as a finance instrument to finance infrastructure development in Nigeria brings about the following questions: what is bond? What is its origin and uses? What amount of bond is adequate to finance public utilities in Nigeria? What methodology is appropriate in measuring the impact of bonds on public utilities in Nigeria?

(Sharpe, Alexander and Bailey, 2004; Fisher and Jordan, 2008), Bond in its simplest meaning is a corporate or government certificate acknowledging that a person has lent money to the firm or government. The certificate specifies the holder's extent of exposure in terms of money investment in the corporation or government.

According to Wikipedia, "a bond is a debt security, in which the authorized issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay interest (coupon rate) to use and to repay the principal at a future date, termed maturity''. Pandian (2003) stated that a bond is a formal contract to repay borrowed money with interest at fixed interval. This is to say, the bond issuer is under legal obligation to make interest payment at regular interval to investors and repay the entire bond principal at a later prescribed time, called the maturity date.

Akujuobi, 2006, explained that government bond is a firm contract of indebtedness entered by the government of a State with investors, that is, bond holders that have subscribed to or lent money to the state". In the contract, the State Government promises payment of an agreed rate of interest (coupon) at regular interval to bondholders, and the principal amount at a specified future date, the maturity. The agreed rate of interest may be fixed or adjustable with caps and limits. A bondholder is therefore an investor who expects income at regular interval from the State for the use of his/her moneys until the principal amount is repaid. Thus, in this context, interest is the reward the issuer of the bond–Government - pays to bondholders for the use of the borrowed funds.

Cuthbertson and Nitzsche, 2005; Bhalla, 2005, A bond is not less than a loan, thus, may or may not come with covenants; covenants that may inhibit appropriation of future income to cater for future developmental needs of a State. Investors are interested in state government bonds because they are considered less risky compared to corporate bonds because of the singular fact that a State is perpetuity in terms of existence.

a) Relevance of Bonds as a Source of Finance in Nigeria

According to Ezirim, and Nzotta, 2005, the sources of funds available to government for carrying out its activities are not limited to statutory allocations, internally generated revenues, grants and aids from international institutions and donor agencies only. Governments could raise funds from both private and institutional investors as well as other governments by way of borrowings.

Nzotta, 2004; Ebulu, 2010, observed that some State Governments in Nigeria are falling back to the option of utilizing the capital market by way of issuing registered bonds to raise funds to enable them finance conceived developmental projects thereby appropriating future income for present engagements.

Musa and Kihongo (2011) stated that when a government wishes to borrow money from the public on a long term basis, it usually does so by issuing or selling debt securities such as bonds. Therefore the relevance of bond as a source of fund in Nigeria in order to generate revenue to finance capital project cannot be under-rated.

Some Nigerians have suggested some methods that can be used to close the infrastructure gap and economic development in Nigeria to include private equity, project-based finance, asset-backed finance, privatization, bond issues and of course private capital inflows. Recently, the Central Bank of Nigeria advocated for the participation of pension funds in financing the power sector and other critical infrastructural projects.

b) Relevance of Public Utilities to Economic Development

Orimobi, 2011, state that all governments come with visions and dreams to strategically position the country for growth and economic development. This may arise as a result of development of public utilities in form of infrastructure and provision of basic amenities in the states which is dependent upon the availability of financial resources.

Kenya's issuance of government infrastructure bonds, i.e. longer-term bonds funding infrastructure projects, during the global financial crisis (to finance roads, water, and energy projects) is an example for governments in other countries with sufficiently developed domestic bond markets to follow. Besides supporting aggregate demand during the crisis, the issuance aimed at removing supply-side bottlenecks to growth. Since February 2009, Kenya has successfully issued 3 infrastructure bonds with a total value of USD 1 billion. This issuance has also paved way for corporate

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bonds issues by private or state-owned companies, for harnessing domestic resources and development of infrastructure. Still, given the underdeveloped local capital markets in most African low income countries and also some middle income countries (e.g., Swaziland), access to international capital markets is key for securing stable and longer term financing.

Ghana's issue of an external sovereign bond of $750 million in late 2007 was another innovative infrastructure financing among African LICs. It also set the benchmark for sovereign and private sector borrowing on the international capital market by other frontier market countries. Due to the tight credit conditions stemming from the global financial crisis, most sovereign debt issuances by Southern African governments were deferred in 2009 and 2010. Given Africa's resilience during the crisis, demand for Africa's bonds is expected to rise in 2011. Ghana's experience highlights the importance of structural reforms, macroeconomic stability, credit rating and preparation before accessing international markets. Another lesson for African governments accessing the international capital markets is that macroeconomic frameworks need to be robust to swing in capital flows.

Ethiopia was a pioneer in Africa on issuing Diaspora bonds to finance infrastructure. The Millennium Corporate Bond targeted both Ethiopians at home and abroad, aimed at raising capital for the state-owned Ethiopian Electric Power Corporation. Across the continent, Diaspora bonds thus constitute an untapped way to mobilize resources in frontier markets with a large diaspora population (e.g., Ethiopia). The World Bank estimates that Southern African countries could raise $5-10 billion per year through such bonds. They are thus a potential source of longer term financial resources for infrastructure, complementing remittance flows that are typically used for consumption or social expenditures.

c) Financing of Public Utilities with Bond in Nigeria

Nigeria is currently facing roads, electricity, water supply and other public utility projects malnutrition. It is said that about half a trillion dollars worth of investment is required to bridge the public utilities gap of Nigeria with that of South Africa. In the view of Nigeria's Urban Development Bank, the country needs yearly investment of at least $20 billion. This requirement is far in excess of available public financing source. As at May, 2010, the Debt Management Office had issued N80 Billion worth of 20 years, 5 years and 3 years bonds, while it has arranged to issue $500 Million sovereign bond. In addition, about N200 billion corporate bonds were issued within the first quarter of 2010. The Debt Management Office in 2011 said she planned to float Diaspora bond of not less than five years tenure in 2012 to raise fund to finance public utilities in terms of infrastructure in Nigeria.

III. Data for the Study

The empirical investigation of the use of bonds to finance public utility is based on a thirty two years adjusted bond data from 1980 to 2011. The data were sourced from the Nigeria Stock exchange (NSE), Security and Exchange Commission (SEC), Central Bank of Nigeria (CBN) Statistical Bulletin, World Bank Economic Review and the International Financial Statistics (IFS) Bulletin. Since the analysis here is based on public utility thus we used Infrastructural development data to represent public utility. The total bond comprises of federal and state government bonds in order to capture the relationship between bonds and public utility. The political instability dummy comprises of both the civilian and military regime in Nigeria from 1980 to 2011. We assign one for civilian regime and zero for military regime.

IV. Methodology

Any previous studies on the impact of Bond Finance on Public Utility if there exist any may not have considered the type of variables applied in this study and also the problem of unit roots in its analysis. The analysis to be used in this study is primarily based on test provided by Engle and Granger (1987), and Engle and Yoo (1987).

a) Model Specification

In order to account for the impacts of bonds finance on public utility in Nigeria, the model of the study is hereby specified as follows:

INFDEV= f (BND, INF, INT, POL)

The above model is hereby written in log —linear form as:

$$LOGINFDEV = b_0 + b_1 LOGBND + b_2 LOGINF + b_3 LOGINT + b_4 LOGPOL + \mu$$

apriori, $b_1>0$, $b_2<0$, $b_3>0$ $b_4>0$

Where: INFDEV = Infrastructural development

TB = Total Bonds

INF = Inflation Rate

INT = Coupon Rate

POL = Political instability Dummy

b_0 = Intercept Parameter

μ = Captures other variable not included in the model and it take care of other factors that cannot be observed or computed due to lack of data. μ is referred to as error term, residual or stochastic term.

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Table 1 : Stationarity Test

Variables	ADF Test	Order of Integration
LogINFDEV	2.1834 (2.1296)	1(0)
ALogINFDEV	2.0370(1.9835)	1(1)
LogTB	1.2945 (1.2532)	1(0)
AlogTB	1.5612(1.2734)	1(1)
LogINF	2.1784 (2.6531)	1(0)
ALogINF	3.9634 (2.8963)	1(1)
LogINT	1.9457 (1.7936)	1(0)
ALogINT	0.7519 (1.0001)	1(1)
LogPOL	0.7812 (1.8481)	1(0)
ALogPOL	2.9616(2.6924)	1(1)

Source: Computed using eview5.

Table 2 : Johansen Co-integration Test Results

Sample: 1980 – 2011 Series: Log INFDEV, Log TB, Log INF, Log INT, Log POL				
Eigen value	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No. of CE(s)
0.81	102.7523	89.44	100.12	None**

Note: (**) (denotes rejection of the hypothesis at 1% and 5% significance level respectively.*
Lags interval: 1 to l
Source: computed.

Table 3 : Long-run Infrastructural development and Bond Model Estimates

Modeling Log (INFDEV) by OLSSample: 1980 – 2011		
Variable	Co-efficient	t-value
C	2.1422	0.2192**
Log TB	1.2391	3.4397**
Log INF	1.9093	3.9551**
Log INT	0.2821	0.8451**
Log POL	0.2734	2.4215**

Notes: R^2= 0.75 F = 23.021 N=32 Adj. R^2 = 0.68 Prob (F--Statistic) = 0.00011 DW= 1.63
Schwarz information criterion 1.008
*** Significant at 5% Level*
Source: Computed using eview 5.

*Table 4 :*Short-run over — parameterized Infrastructural Development and Bond Model

Model Estimates Log (INFDEV) by OLS
Sample: 1980— 2011

Δ Model Sample:	Log (INFDEV) by OLS 1980— 2011	
Variables	Co-efficient	t-value
Constant	0.9435	0.2475**
Δ LogINFDEV(-1)	2.9142	2.8421**
Δ LogINFDEV	2.2934	0.2671**
Δ LogTB(-1)	0.7832	0.5612**
Δ LogTB	0.0378	0.1117**
Δ LogINT	0.9431	1.2934**
Δ LogINT(-l)	0.5821	0.2378**
Δ Log INF	0.9277	0.5234**
Δ Log INF (-1)	0.9312	0.6892**
Δ Log POL	0.0005	0.1345**
Δ Log POL(-1)	0.0001	1.2934**
ECM(-1)	0.3491	1.2948**

Notes: R^2 = 0.87 F=11.23 Adj R^2 = 0.81 Prob (F — Statistic)=0.007975 DW= 1.46 Schwarz information criterion= 0.713
Source: Computed using eview 5.

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Table 5 : Short-run Parsimonious Model Estimates

	Modeling Log (INFDEV) by OLS Sample: 1980 – 2011	
Variables	Co-efficient	t-value
Constant	3.1789	0.2473**
Log INFDEV	4.2913	2.3451**
Log INFDEV (-1)	3.8426	1.2357**
Log TB	0.9347	2.0001**
Log TB (-1)	0.6893	1.8312**
Log INF	0.2174	0.1283**
log INF (-1)	0.7832	0.2391**
Log INT	1.3467	0.2314**
Log INT (-1)	0.9215	0.1452**
ECM ($\bar{}$ 1)	1.2672	1.2943**

Notes: R^2 = 0.87 F = 10.02 Adj R^2 = 0.83 Prob (F-statistic)= 0.000163DW=0.98Schwarz information criterion =1.10
*** Significant at 5%.*

V. Result and Discussion

The thrust of the study was to investigate empirically the role of bond on public utility in a developing economy using Nigeria as a case study. Infrastructural development was used to replace public utility as a dependent variable and bond as independent variable in order to test for the validity of some conjecture made in this study. Bonds in developing economy were issued mainly to finance budget deficits which could have resulted from recurrent expenditure.

From the Long-run infrastructural development and bond model presented, the coefficient of bond seems moderate (1.2391). This implies bonds have no stronger impact on public utilities. This is backed by the fact that volume of government bonds does not measure up with the public utilities.

The inflation rate variable which is a most sort time series/macroeconomics variable does not have an aproari expectation in all the test carried out in this empirical work hence; it is not correctly signed and not statistically significant.

However the short-run parsimonious model yielded a coefficient of 1.3467 for interest rate, which is quite significant. The logic here is that high interest rate results in high bond coupon rate. The coupon rate when high, will attract investors hence more money is realized through bond issuance, which will invariably impact positively on public utilities.

The apriori expectation is that political risk is high under military regime and low under civilian administration. The risk is expected to negatively impact on the economy as well as infrastructural development. However, the political risk coefficient under the long-run model in table 3 (0.2734) and its coefficient under short run over-parameterized model in table 4 (0.0005) are all positive values though considered insignificant. It therefore implies that political risk as represented by type of government has no significant effect on infrastructural development and a Durbin–Watson statistic (DW) of 1.63 which symbolizes positive serial correlation.

VI. Conclusion

The aim of this empirical study is to investigate the impact of bond finance on public utility in a developing economy. The study applied a Co-integration technique. It was found empirical support for some conjectures made in the literature. Hence it is concluded that there is a linear relationship between bond and public utility. Given the important of the use of bond for financing, it becomes expedient to examine how public utility can clearly be finance with bond in a developing economy.

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