Impact of Domestic Public Debt and Institutional Quality on Financial Development in Nigeria

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Abstract
This paper analyses the impact of domestic public debt and institutional quality on financial development in Nigeria, using time series data for the period of thirty-seven (37) years (1980-2017). In analyzing the data, the paper uses Autoregressive Distributed Lag (ARLD) model and the result indicates that domestic public debt composition has significant negative impact on financial development in Nigeria. However, the interaction between domestic public debt composition and institutional quality has significant positive impact on financial development. The study concludes that domestic public debt in the presence of strong institutional quality promotes financial development. The main recommendation of the study is that government should strengthen financial and political institutions. This is expected to reduce risk, increase stability and efficiency of the financial system. Policy makers should also control spending, manage debt and maximize domestic revenue collection.

Key words: ARDL, Financial Development, Co-integration, Domestic Public, Debt Composition, Institutional Quality.
JEL Classification: P34, H63

1. Introduction
Resulting from the 2008 Global Financial Crisis, many nations embarked on fiscal stimulus plans in response to the fiscal imbalance from the great recession. The fiscal consolidation measures employed by some countries drew the interest of researchers and policy makers on the role of fiscal policy on economic stability (Reinhart and Rogoff, 2011). This phenomenon is severe in developing countries that are prone to financial instability (Smaoui, Grandes & Akindele, 2017). King'wara (2014); and Maana, Owino, and Mutai, (2008) have empirically shown how expansionary fiscal policies mostly financed from domestic public debt crowd out private investment, hence financial development. Hauner (2008) argued that the effect of domestic public debt on financial development may not necessarily be on reducing the loanable funds but reducing the efficiency of banks to

advance credit to private sector. Nigeria provides a useful setting for analysis of the impact of domestic debt on financial development, because the country is characterized by underdeveloped domestic debt market and financial instability (Smaoui *et al.*, 2017). This is further aggravated by recurring economic recession.

However, not very much attention has been given to understanding of the role of domestic public debt in financial development within the purview of institutional quality. Some few works which dwelled on this issue included the empirical work of Hauner (2008; 2009) and the theoretical exploration of Ismihan and Ozkan (2012). However, Ismihan and Ozkan (2012) have only offered alternative explanation on the interaction between fiscal policy and financial development. Recently, Ayadi, Arbak, Naceur and Groen, (2015) wrote on the determinants of financial development in Mediterranean countries using panel data with fixed random effect method. According to Chinn and Ito (2006), the degradation of the institutional environment, such as frauds, market manipulations, false trading, market rigging and false representations, have been common challenges to financial development. The ineffectiveness of institutional environment to strengthen the market integrity through a viable rule of law to promote investors' confidence has been argued to be associated to poor performance of financial market and financial institutions. Institutional quality is a crucial factor that shapes the relationship among economic agents. These institutions comprise the legal, political and supervisory bodies that provide stability and order in business activities. The institutional quality is described as factor stemming from government policies and programmes which influence economic outcomes or the ability of economic entities to achieve their business goals and objectives (Kutivadze, 2011).

Therefore, this study examines the impact of domestic public debt and institutional quality on financial development in Nigeria. In other words, the paper aims at examining the joint effects of domestic public debt and institutional quality on financial development. In achieving this objective the paper is structured into five sections: Section one introduces the paper, section two reviews related literature, section three deals with methodology, section four presents results and discussion while section five is the conclusion and recommendations.

2. Literature Review

Earlier literature on financial development (Mckinnon, 1973; Show, 1973) emphasize on evils of government intervention such as interest rate ceilings, direct credit programmes and higher reserve requirement as the main factors that hinder financial development. However, it has been observed that not very much attention has been paid to the role of domestic debt securities on financial development of, especially developing countries.

Mehrotra *et al.,* (2012) argued that developed domestic debt security market allows the private sector to issue its own debt in the market, making the financial system and the broader economy more resilient to shocks. In the same vein, Kumhof and Tanner (2005) stressed the significance of domestic debt market. It provides wide range of instruments and serves as a bench mark for the price of security instruments in the market. Similarly, Abbas and Christensen (2010) stated that issuing domestic debt instruments to finance fiscal deficit reduce risk and is considered healthier for financial development. This is because it mops up

monetary liquidity thereby addressing rise in inflation which according to Boyd *et al.,* (2001) has negative impact on financial development.

Nevertheless, the literature stressed that domestic debt instruments play significant role only in the presence of sound institutional and macroeconomic framework (Abbas and Christensen, 2010). Government debt securities are vital instruments for collateralized lending in the interbank market, and also help the management of banks to effectively manage their liquidity thereby minimizing the need for frequent central bank intervention (Detragiache, 2005). Ndikumana, (2001) added that central bank's operations in a well-developed domestic debt market rely less on direct controls such as higher reserve ratio and interest rates control which promote financial development.

On the other hand, some literature argue in favour of the negative impact of domestic debt security markets on financial development. For example, Hauner (2008) argued that banks investing in public debt securities are more profitable but less efficient and tend to prefer short term portfolio allocation and thus build additional vulnerabilities where domestic banks and institutional investors may be induced by moral suasion to absorb high government debt. In another study by Hauner (2009) which he termed "lazy bank approach", it was reported that domestic debt increases share of bank credit absorbed by the public sector which in turn slows financial development. When government issues more securities, banks tend to shift their portfolio to a less risky investment at the expense of advancing credit to private sector which is seen as one of the main indices of financial development (Janda & Kravtson, 2017; Mbulawa, 2015; Ismihan and Ozkan, 2012).

However, as stated earlier, the structure of government debt markets in developing countries has changed dramatically. The investor base has broadened with increased participation of institutional investors which has implication on financial development (see Hauner, 2009 and Bua *et al,*. 2014). Another issue is that previous studies did not capture the influence of structural breaks in the data gathering process, which is obvious using developing countries' data typical of Nigeria. Existence of structural break might affect the reliability of the previous findings. Zivot and Andrews (1992) highlighted the importance of accounting for structural breaks in the estimation process. This motivates the research to examine the impact of domestic public debt composition on financial development by taking into account the presence of institutional quality.

3.0 Methodology
This study uses secondary data for a period of 37 years and was collected from the World Bank and the Central Bank of Nigeria. The following macroeconomic variables were employed; credit to private sector as a ratio of GDP is proxied for financial development following the works of Mun & Ismail (2015) and Ismihan & Ozkan (2012), government debt securities holding of banking system and non-bank as ratio GDP is proxied for domestic public debt composition, and gross domestic product. GDP is obtained from World Development Indicators (WDI), domestic public debt composition is obtained from CBN statistical bulletin, and Regulatory quality is used as a proxy for institutional quality and is gotten from worldwide governance indicator. In analyzing the data the ARDL bound testing approach to co-integration was employed.

The functional specification used in the paper was adopted from the work of Law and Habibullah (2009) and is specified as follows:

$$FD = f(RGDPC, R)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.1$$

Where,

FD= financial development,

RGDPC= real GDP *per capita*,

R = real interest rate

However, to achieve the objective of the study, equation (3.1) is extended to include domestic public debt and institutional quality based on the theory of McKinnon and Shaw (1973) as follows:

The mathematical model is given as

$$FD = f(DPD, INQ, (DPD * INQ), GDP)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots....2$$

Statistically, the mathematical model is re-written as presented in equation (3)

$$InFD_t = \beta_0 + \beta_1 InDPDt + \beta_2 InINQt + \beta_3 In(DPD*INQ)t + \beta_4 InRGDPt + U_t\dots\dots\dots\dots3$$

Where

$InFDI$ = Financial development using credit to private sector as a percentage of GDP following the works of Ismihan and Ozkan (2012) and Mun and Ismail (2015).

β_0 = constant parameter, β_i = coefficient of the explanatory variables I = 1,2……, 4.

U_t = stochastic disturbance term. $InDPDt$ = domestic public debt, $InINQt$ = institutional quality, $In(DPD*INQ)t$ =Interaction term of domestic public debt and institutional quality, $InGDPt$ = gross domestic product and t =time subscript.

3.1 ARDL Bound Approach

Following the woks of Baharumshah, Mohd and Masih (2009) and Umar and Musa (2015), the Auto regressive Distributed Lag (ARDL) model used in this study is expressed as follows:

$$\Delta LFD_t = \beta_0 + \beta_1 LFD_{t-1} + \beta_2 LDPD_{t-1} + \beta_3 LINQ_{t-1} + \beta_4 L(DPD*INQ)_{t-1} + \beta_5 LGDP_{t-1} + \sum \lambda_1 \Delta LFD_{t-i} + \sum \lambda_2 \Delta LDPD_{t-i} + \sum \lambda_3 \Delta LINQ_{t-i} + \sum \lambda_4 \Delta L(DPD*INQ)_{t-i} + \sum \lambda_5 \Delta LGDP_{t-i} + U_t \dots\dots\dots\dots\dots\dots\dots..4$$

Where:

B_0 is the drift component,

Δ is the First difference operator.

LFD is the log of financial development,

DPD domestic public debt,

INQ is the institutional quality and

GDP is the gross domestic product.

β_i, λ_i are Vectors of the parameter of the variables.

U_t is white noise with zero mean.

The null hypothesis in the equation is H_o: $\alpha_1 = \alpha_2 = \alpha_3 = 0$. This denotes the absence of long-run relationship

After establishing an evidence of cointegration among the variables in the model, the long run parameters are estimated based on the specification in Equation 5 below:

$LFD_t=\beta_0+\beta_1 LFD_{t-1}+\beta_2 LDPD_{t-1}+\beta_3 LINQ_{t-1}+\beta_4 L(DPD*INQ)_{t-1}+\beta_5 LGDP_{t-1}+U_t$……..……..…5

In order to estimate the short-run relationship between the variables and the speed of adjustment of the model to equilibrium, the corresponding error correction equation is estimated as:

$\Delta LFD_t=\lambda_0+\sum\lambda_1\Delta LFD_{t-i}+\sum\lambda_2\Delta LDPD_{t-i}+\sum\lambda_3\Delta LINQ_{t-i}+\sum\lambda_4\Delta L(DPD*INQ)_{t-i}+\sum\lambda_5\Delta LGDP_{t-i}$
$+\lambda_6 ECM_{t-1}+U_t$……………………………………………………………………...…6

Where, ECM is the error correction term of one period lag while the coefficient λ_6 measures the speed of adjustment of the model convergence to equilibrium.

4.0 Results and discussion
After analyzing the data collected using the models specified above, we obtained some results which are presented and discussed in this section. The section therefore, comprises of three parts including this introduction. In part two we present result of Unit root analysis and in part three results for bound test for cointegration are presented.

4.1 Unit Root Analysis
The stationarity of the series employed are checked first using ADF test proposed by Dickey & Fuller (1979). The result is shown in Table 4.1

Table 4.1: *Augmented Dickey Fuller Unit Root Test*

Series	Intercept without trend		Intercept with trend	
	Level	1st Difference	Level	1st Difference
LFD	-.0.5805	-2.9275**	-3.0794	-3.5960**
LDPD	-2.5366	-2.7999**	-2.6891	-3.1494*
LINQ	-3.5594***	-3.6964**	-4.0756***	-4.0560***
L(DPD*INQ)	-2.5611	-2.787*	-3.0789	-3.3344*
LGDP	-2.3683	-4.1428***	-1.2780	-3.7648**

Note: ***, ** and * represent significance level at 1%, 5% and 10% respectively. The figures are the t-statistics for testing the null hypothesis that the series has unit root. The lag length is determined and fixed as 4 based on Schwert (1987). The critical values for intercept without trend are -3.479, -2.883 and -2.578 whereas, for intercept with trend the values are -4.028, -3.443 and -3.146 for 1%, 5% and 10% respectively; Source: Researcher's Computation

Tables 1 presents the estimations of the ADF unit root test on the macroeconomic variables that determine financial development. The ADF results show that all the series are not stationary at level except for LINQ under both intercept without trend and intercept with trend, which is found to be significant at 5% level under the two models. Therefore, none of the series is stationary beyond I(1).

However, it is argued that existence of structural break in the data generating process will lead to size distortion and spurious conclusion in the ADF model (Lee & Strazicich, 2003 and Perron, 1989). Thus, in addition to the traditional ADF test, this study employs Lee and Strazicich Lagrange multiplier with one structural break to further check the unit root properties of the series. The results are presented in Table 4.2

Table 4.2: *Lee and Strazicich One-Break LM Unit Root Test*

	MODEL A					MODEL C			
Series	K	$\check{T}_B$	$ť_{rj}$	Test Stat.	Critical value break points Λ	K	$\check{T}_B$	$ť_{rj}$	Test Stat.	Critical value break points Λ
*D*lfd	2	1983	1.329	-3.311^C	0.03	2	2007	-1.224	-4.216^B	0.07
*D*ldpd	2	1990	3.519***	-4.133^A	0.10	2	2007	1.945*	-4.329^B	0.06
*d*LINQ	2	2005	2.551**	-4.123^A	0.07	2	1998	3.960***	-4.788^A	0.10
*d*L(DPD*INQ)	2	2011	1.219	-3.214^C	0.09	2	2009	-1.532	-4.221^B	0.05
*D*lgdp	2	1989	2.282**	-2.748	0.07	2	2005	-3.409***	-3.874^C	0.10

Critical Values	1%	5%	10%
MODEL A	-4.084	-3.487	-3.185
MODEL C	-4.699	-4.128	-3.839

Note: kˆ is the optimal number of lagged first-difference terms included in the unit root test to correct for serial correlation.$\check{T}_B$ denotes the estimated break points. $ť_{rj}$ is the t value of DTjt, for j=1. A, B and C indicate significance of the LM test statistics at 99%, 95% and 90% significance level, respectively. While ***, ** and * indicates the two-tailed significance level of the break date at 99%, 95% and 90% respectively; Source: Researcher's Computation

The result also indicates a mixture in the order of integration in the LS test in Table 4.2 as found in the ADF test. In other words, all the series are found to be stationary only after taking their first difference under both crash and trend models with the exception of LINQ. But LFD is characterised with breaks in both level and trend. However, the test established that the break dates are not statistically significant.

4.2   Bound test for Cointegration

The bound test for cointegration is estimated to determine whether there is cointegration among the variables captured in the ARDL model. This has been achieved using the bound testing approach and the results are presented in Table 4.3.

Table 4.3: *ARDL Bound Cointegration Test*

Model	*F*-Stat.	Sig. Level.	Critical Value	
			I(0)	I(1)
LFD = *F(LDPD,LINQ,L(DPD*INQ),LGDP)*	4.120**	10%	2.26	3.35
LDPD = *F(LFD,LINQ,L(DPD*INQ),LGDP)*	2.267	5%	2.62	3.79
LINQ = *F(LFD,LDPD,L(DPD*INQ),LGDP)*	3.127	1%	3.41	4.68
L(DPD*INQ)= *F(LFD,LDPD,LINQ,LGDP)*	3.035			
LGDP = *F(LFD,LDPD,L(DPD*INQ),LGDP)*	4.021**			

Note: ***, ** and * represent significance level at 1%, 5% and 10% respectively. The critical values are based on Narayan (2005), case III for T = 35 due to small sample size of the study. Source: Researcher's Computation

The bound test results in Table 4.3 revealed the existence of two cointegration vectors among the five vectors. When financial development is the dependent variable, the null hypothesis of no cointegration is rejected at 5% level of significance. This is because the F-statistic, 4.120 is greater than the upper critical value of 3.79 indicating that there is

cointegration. Such cointegration also exists at 5% significant level in the case of LGDP been taken as the dependent variable. This is because the F-statistics, 4.021 is greater than the upper critical value of 3.79. However, cointegration does not exist in the equations with LDPD, LINQ, and L(DPD*INQ) as the dependent variables.

Table 4.4: *Long Run and Short Run Coefficients*

Variables	*Long Run Coefficients*		*Short Run Coefficients*	
LDPD	-0.372**	D(LDDB)		-0.262***
	(-2.740)			(-3.442)
LINQ	0.017*	D(LINT)		0.034*
	(-0.985)			(-0.966)
L(DPD*INQ)	0.169*	L(DPD*INQ)		0.057***
	(2.026)			(3.159)
LRGDP	0.630**	D(LRGDP)		0.214**
	(2.542)			(2.244)
CONSTANT	-3.217***	CointEq(-1)		-0.415***
	(-2.077)			(-2.236)

*Note: *** (**) * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The figures in parentheses are the T-statistics; Source: Researcher's Computation*

LDPD coefficient from Table 4.4 is -0.372 indicating a negative effect of domestic public debt composition on financial development in the long run. The coefficient is significant at 5% level of significance. Therefore, a percentage point increase in domestic public debt composition decreases financial development by 0.372 percent. The relationship is also negative and significant in the short run. This is in line with the results of Mun and Ismail (2015) and Ismihan and Ozkan (2012). This also means that there is the possibility of financial crowding out where government borrowing through excessive bond subscription of the banking system replaces private borrowing in the banking sector portfolios. This is basically true in developing countries like Nigeria where the government and the private sector borrow from the same pool (Bua *et al.*, 2014).

The coefficient of institutional quality, 0.017 also indicates a significant positive relationship with financial development at 10 percent level of significance in the long run. This result is in conformity with the results of Kutivadze (2011) as well as Chinn and Ito (2006). Strong institutions and the legal and regulatory environment are one of the factors that promote the development of a healthy financial system. Abbas and Christensen (2010) found that financial development is stronger in economies where institutions better protect and enforce property rights and reinforce the rights of creditors. Furthermore, Ayadi, Arbak, Naceur and De Groen (2015) and Law & Habibullah (2009) also found that the existence and quality of institutional checks and balances significantly influences crisis mitigation and success of financial reforms.

The interaction term L(DPD*INQ) is positive and significant in both the short run and the long run. The coefficient of 0.169 in the long run, shows a significant positive impact of domestic public debt composition in the presence of institutional quality on financial development at 10 percent level of significance. This means that with strong institutions, a

percentage point increase in domestic public debt will increase financial development by 0.169 percent. This result is in line with the assertion made in Law and Habibullah (2009). Therefore, for domestic public debt to have the significant effect on financial development stated in Kumhof and Tanner (2005), quality of institutions and regulatory bodies needs to be strengthened. This is expected to reduce risk, increase stability and efficiency of financial system. It will also help to control spending, and manage debt.

The coefficient of LRGDP also shows a statistically significant effect of real gross domestic product on financial development at 5% level in both the short run and the long run. The long run coefficient of 0.630 indicates that a percentage point change in LRGDP decreases the level of financial development by 0.630 percent. The result is in agreement with the framework of (Shaw, 1973) which states that with economic growth, more resources are mobilized for savings and investment. Economic growth also increases the volume of financial transactions which in turn boots financial deepening.

The error correction coefficient (ecm) which is approximately -0.415 not only has the expected sign but also statistically significant at 1% level of significance. The value of the error correction term implies a fairly slow speed of adjustment to equilibrium after a shock.

Table 4.5: *Diagnostic Test*

| Test Statistics	Chi-Square/LM Test	Probability Value
Serial Correlation	1.001	0.325
Functional form	1.299	0.263
Normality	4.744	0.742
Heteroscedasticity	0.222	0.640

Note: Serial correlation is examine using Lagrange Multiplier test of residual, functional form is based on Ramsey's RESET test, normality base on skewness and kurtosis while Heteroscedasticity is based on squared residuals on squared fitted values; Source: Researcher's Computation

The test statistics on each of the null hypotheses could not be rejected at any conventional level of significance. Therefore, we conclude that there is no serial correlation, model misspecification, non-normality and heteroscedasticity. Hence, the results of the diagnostic test indicate that the coefficients of the estimated model are not associated with the problems of serial correlation, model misspecification, non-normality of residuals and heteroscedasticity.

The stability of the estimated coefficients is also examined using cumulative sum of recursive residuals and cumulative sum of squares of recursive residual. This is shown in figures 1 and 2 below.
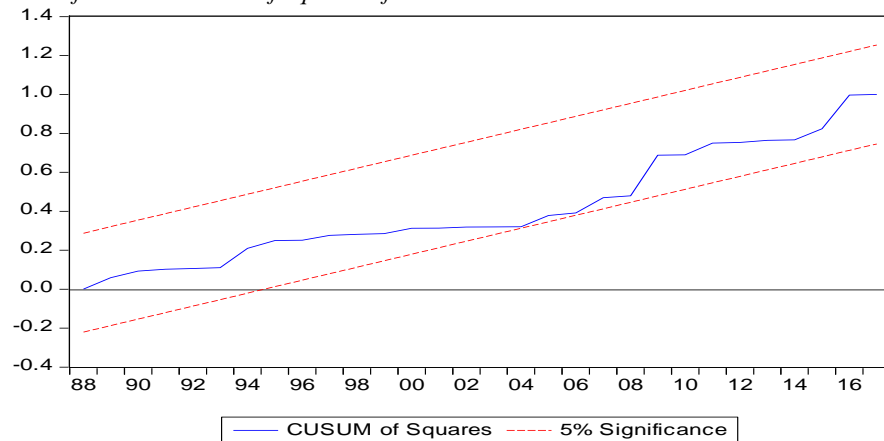
Figure 1
Plot of Cumulative Sum of Recursive Residual
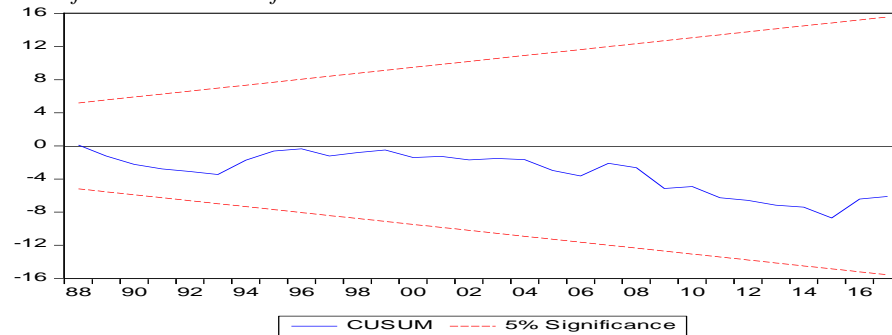
We checked the stability of the long-run relationship between financial development and its determinants. We used the CUSUM tests to test for constancy of long-run parameters. The tests are applied to the residuals of the model. The plot of the CUSUM statistics stays within the 5% significance level, therefore, the estimates are stable.

Figure 2
Plot of Cumulative sum of Squares of Recursive Residual

Next, we checked the stability of the long-run relationship between financial development and its determinants. We used the CUSUM-squared tests to test for constancy of long-run parameters. The tests are applied to the residuals of the model. The plot of the CUSUM-squared statistics stays within the 5% significance level, and then the estimates are stable. The coefficients are found to be stable over the period under study. Figures 1 and 2 show that the parameters are within the upper and lower critical bounds at five percent level of significance.

5. Conclusion and Recommendations

Based on the findings of this study it could be concluded that domestic public debt composition in the presence of institutional quality has a significant positive impact on financial development in Nigeria. This means that with strong institutional quality any increase in domestic public debt composition can promote financial development.

Therefore, we recommend that to maintain a high level of financial development in the case of rising domestic debt composition, corrupt practices within financial institutions and financial markets should be checked so as to boost investors' confidence and financial market liquidity. This means that the fight against corruption at all levels should be intensified by strengthening the anti-corruption agencies like the EFCC and the ICPC. Secondly, the regulators of financial market and financial institutions (Security and Exchange Commission, Nigerian Stock Exchange and Central Bank of Nigeria) should reinforce their standard for market regulation and supervision. And finally, government must ensure that any money raised from public debt offer should also be used prudently and judiciously.

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