Business Administration and Business Economics

Financial Development and Economic Growth Nexus in Nigeria: Further Evidence from Long-run Estimates

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Abstract: This study examines the impact of financial development on economic growth in Nigeria using annual time series data between 1980 and 2014. The study tests for the unit root and co-integration to determine the time series properties of our variables before using ordinary least square estimation technique to evaluate the long-run estimates and possible policy inferences. The financial development indicators are financial deepening, bank deposit liability, private sector credit ratio, stock market capitalization and interest rate, while economic growth is measured by real gross domestic product. The results show that all the indicators of financial development except private sector credit ratio have positive impact on the economic growth in Nigeria. it implies that banking sector and stock market development played critical role in the output growth of the real sector. However, the negative impact of private sector credit indicate that provision of credit to investors do not enhance output due to high interest on loan as reported in the study. Thus, the study suggests that for the country to experience finance-led growth in Nigeria, the apex bank must ensure that loans are available to local industrial investors at a low interest rate.

Keyword: Financial deepening; bank deposit liability; private sector credit; stock market capitalization; interest rate and output

JEL Classification: C

1. Introduction

In the recent time, there have been advocacy for the removal of credit barriers by relaxing financial constraint facing small and medium firms in order to enhance both industrial and national output. A well developed financial system enhances investment by identifying and funding good business opportunities, mobilizes savings, enables trading, hedges and diversifies of risks, and facilitates the exchange of goods and services. These functions result in a more efficient allocation of resources, rapid accumulation of physical and human capital, and faster technological progress, which in turn results in economic growth (Adelakun, 2013).

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The manufacturing sector had not only played a vital role in the output growth but has also improved exports and reduced unemployment and poverty level of every economy. In support of this position, the Kaldor's first law state that manufacturing sector is regarded as the engine of growth of the economy (Libanio, 2006). While it can be argued that financial sector reforms may have helped to build and foster competitive and healthy financial systems, it is however still debatable, if the structure of portfolio investment has the capacity to support the desired economic development aspiration of the proponent considering the catalytic role it plays in stimulating the desired growth of any economy.

Accordingly, firms in Nigeria are faced with the problem of accessibility to funds. Even the financial sector reform of the Structural Adjustment Programme (SAP) in 1986, which was meant to correct the structural imbalance in the economy and liberalize the financial system did not achieve the expected results. The development of the financial sector in Nigeria has also been hindered by the lack of adequate coordination and harmonization of fiscal and monetary policies which have even deteriorated the performance of the Nigerian financial sector. The high cost of assessing funds has also discouraged investors from patronizing the banking system (Nnanna, Englama & Odoko, 2004). The concern in Nigeria is that financial institutions (mostly banks) have not performed to expectations in terms of mobilizing savings for financing long-term development projects in the real sector (Adeoye & Adewuyi, 2005). Further, there is no apparent and appreciable contribution of financial deepening to economic growth in the post-SAP era (Ayadi, 2009).

Empirically, there is no consensus in the results of scholars that had established the relationship between financial development and economic growth. Most of these studies had employed the causality test to ascertain the causal direction among the variables. Some of the studies argued that financial development drives economic growth (Nieh et al., 2009; Shittu, 2012 etc.), scholars such as Odhiambo (2011) and Odeniran and Udeaja, (2010), among others said economic growth drives financial development and other studies like reported bi-directional relationship between finance and growth. Due to lack of consensus in the results of past studies, this study hereby established the nature and direction of the relationship between financial development and economic growth in Nigeria using the annual time series for the periods of 1980 and 2014. Other parts of the study are divided into four sections. Section two reviews the existing theoretical and empirical literature. Section three covers methodology, data description and sources. Section four presents discussion of the findings while section five concludes and proffers proper policy recommendation.

2. Theoretical and Empirical Review

During the 1990s, studies reestablished the theory of the relationship between financial development and growth by examining the links existing between the real sector and the financial sector. Some of the famous works of the period were carried out by King and Levine (1993) and Levine (1997) as they revealed the significant role of the financial sector in the development of the output growth of every economy. The scholars used correlation analysis to establish the level of association between growth in GDP and the size of financial system. Beck and Levine (2004) said the financial institutions (banking system and financial market) can only improve the output growth of an economy if there is industry functions well, free flow of information, low transaction cost and an optimal resources allocation.

Hermes and Lensink (2000) said the stock market played an important role in the process of financial intermediation mainly through the market regulations so as to restore the hope of the poor. The author also identified the role thee deposit insurance played in the stability of the banking sector. Berglof and Bolton (2002) opined that during the first decade of transition, the relationship in terms of development between financial sector and real sector appeared weak when it is viewed from the ratio of the domestic credit to the size of the economy (GDP). Examining the long-run relationship between finance and growth, Kenourgios and Samitas (2007) found that one of the main drivers sustaining growth in Poland over the year is credit access to the private sector.

Using the dynamic panel General Method of Moment (GMM) technique, Ngogang (2015) examined the impact of financial development on the economic growth of twenty-one Sub-Saharan African countries. The author reveals that there is a strong direct relationship between financial development and economic growth. Guryay, Safakli and Tuzel (2007) employed ordinary least squares method to investigate the role of financial development in the development of the Northern Cyprus economy. The study reported a weak positive impact of financial development on economic growth in the region. The causality tests showed that a uni-direction causal relationship from growth to financial development, implying that growth in output enhanced the development of financial intermediaries.

Audu and Okumoko (2013) re-established the relationship between financial development and economics growth in Nigeria within the periods, 1970-2012. The author employed the long–run parsimonious error correction model to establish the links. The co-integration result reported the existence of a long-run relationship between financial development and economic growth. The study also reveals that the relationship between lending rate and output growth do not conform to the apriori expectation, however a significance impact was reported. The commercial bank credit to private sector has follows the theoretical expectation as it has

positive and significant impact on economic growth. Contrary, the commercial bank credit to non-financial private firm has indirect impact on economic growth in the Nigerian economy. The relationship between money supply to the Nigerian economic size and output growth was negative which was contrary to expectation. The ratio of commercial bank deposit to gross domestic product follows apriori expectation which also had significant impact on economic growth in Nigeria.

Mba (2015) investigates the impact of financial liberalization on economic growth in Nigeria between the periods of 1986 and 2011 using long-run estimates from Ordinary Least Square method. Using credit to private sector as a ratio of GDP to proxy financial liberalization, the findings showed that financial liberalization has negative impact on output growth in Nigeria. The author argued that the credits to private sector have not used for productive activities which could have increased output but rather for buying and selling of consumables. The co-integration result reveals a long run relationship among the variables. The study advocates for change in the lending priority of the commercial bank to lend money to genuine private investors and not to the government and influential borrowers.

Ebiringa and Duruibe (2015) used vector autoregressive model to analyze the relationship between financial system development and economic growth in Nigeria. The empirical results reveal that there is no long run causality from financial system development indicators to growth. This implies that the role of the financial institutions in terms of credit access to the less privileged played towards the output growth has been less significant in Nigeria. In the short-run, the effect of financial development on economic growth was spositive. The study suggested that the financial system need further deepening by offering innovative financial products and service and sound monetary policy formation and implementation in order to adequately support short and long-term growth.

Odeniran and Udeaja (2012) used the Granger causality tests in a variance autoregressive framework to verify the competing finance-growth nexus hypothesis between the periods, 1960-2009. The study used the broad money stock as a ratio of GDP, growth in net domestic credit to GDP, growth in private sector credit to GDP and growth in banks deposit liability to GDP to measure financial sector development while growth in GDP per capita to measure economic growth. The study reported that all the financial development indicators granger-cause output growth. However, growth does not granger-cause all the financial development indicators. Specifically, GDP per capita granger cause net domestic credit and credit to private sector to the size of the economy at 0.01 critical region while it does not granger cause financial deepening and deposit liabilities at 5% significance level. Thus, net domestic credit and credit to private sector are equally driven by growth in output, thus indicating bidirectional causality for the indicators. The result from the variance decomposition reports that shock to deposit

does not significantly affect net domestic credit, implying that the share of deposit liability in the total variations of net domestic credit is negligible.

3. Research Methodology

This study adapted and modified the model of Odeniran, and Udeaja (2010) to investigate the relationship between financial development and economic growth in Nigeria. The study expresses real GDP per capita to measure real growth rates. However, a limitation of studies on the financial sector is that there is no single measure of financial sector development, therefore, instead of a single proxy; three measures were adapted from the work of Odeniran, and Udeaja (2010) and one additional measure was introduced in this study in order to improve the robustness of the results. The first measure is M2-to-GDP ratio otherwise known as measure of financial deepening. The ratio measures the degree of monetization in the economy as well as the depth of the financial sector while it also shows an expansion of payment and saving functions. The second measure used in the study is the ratio of bank deposit liabilities to GDP. The new measure is stock market capitalization as a measure of stock market development. This determines the capacity of the banking sector to perform its core role of allocating funds between savers and firms. The third ratio is private sector credit to GDP which reflects the extent to which financial intermediaries allocate society's savings as well as firms" use of credit in addition to internal funds. Other variable included is interest rate.

$$RGDP = f(FDEP, BDL, PSCR, SMC, INTR) \qquad [3.1]$$

The transformation of the model in the form of an econometric model to include the error term is as follows:

$$RGDP_t = \beta_0 + \beta_1 \log FDEP_t + \beta_2 BDL_t + \beta_3 PSCR_t + \beta_4 SMC_t + \beta_5 INTR_t + \mu_t$$
$$[3.2]$$

Where: $RGDP$ = Real gross domestic product; $FDEP$ = Financial deepening (M2/GDP); BDL = Bank deposit liability; $PSCR$ = Private sector credit ratio; SMC = Stock Market Capitalization; $INTR$ = Interest rate; β_0 = constant; β_{1-5} = coefficients and μ_t = mutually uncorrelated white noise residuals. The A'priori expectation provides expected signs and significance of the values of the coefficient of the explanatory variables under the review on the part of the empirical evidence and theoretical assertions. The variables - financial deepening, stock market capitalization and private sector credit are expected to exert a positive influence on economic growth while the impact of interest rate and bank deposit liability are expected to be negative.

However, the first step before testing cointegration and long-run estimates is to test the time series variables for their stationarity. Following the agitation made by Engle and Granger (1987), they argued that a linear combination of two non-stationarity series can be stationary and if it thus exists, the time series of such variables are considered to be cointegrated. However, this reveals that the series have the same order of integration. Therefore, this study used the Augmented Dickey Fuller (ADF) by Dickey and Fuller (1979, 1981) to confirm the validity of stationarity level (either difference stationary or trend stationary) in the data sets. After the unit root test, the study used the Johansen cointegration test to determine the Trace and Maximum-Eigen value for our cointegration test. Other post-estimation diagnostic tests carried out in this study are the Normality test (Jargua Bera Test) by using the residual diagnostic test, Breuseh Godfrey serial correlation test and White Noise test to check the presence of heteroskedasticity test. All the data are in growth rate.

The time series data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin 2015, volume 26. This time frame for this study covers the period of Pre Structural Adjustment Programme (Pre-SAP), Structural Adjustment Programme (SAP) and Post Structural Adjustment Programme (Post-SAP) era in the Nigerian economy within 1980 to 2014 fiscal year.

4. Empirical Results and Discussion

4.1. Descriptive Statistics

The average growth value of real gross domestic product (RGDP) in Table 1 stood at 35.1%, which reveals that the national output of the Nigerian economy grow at an average level of 35.1%. In addition, growth rate of financial deepening (FDEP), bank deposit liability (BDL), private sector credit ratio (PSCR), stock market capitalization (SMC) and interest rate (INTR) stood at 17.1%, 24.3%, 27.0%, 31.3% and 20.6% respectively indicating their annual growth rate within a quarterly period of 1970 to 2015. The probability value of the Jarque-Bera statistics for all variables shows their distribution level at mean zero and constant variance. Other statistical values presented in the table are minimum, maximum and standard deviation.

Table 1. Descriptive Statistics

	RGDP	FDEP	BDL	PSCR	SMC	INTR
Mean	35.137	17.126	24.306	27.028	31.302	20.578
Median	6.0310	16.500	20.298	23.007	29.091	21.000
Maximum	550.53	38.000	58.865	118.72	140.83	36.090
Minimum	-32.299	8.6000	-1.0917	4.8957	-32.432	9.5000
Std. Dev.	128.99	5.8350	15.571	23.193	41.964	6.0159

Skewness	3.7899	1.7360	0.6083	2.3448	0.8278	0.1168
Kurtosis	15.441	7.0937	2.4035	9.1922	3.6751	3.2253
Jarque-Bera	309.52	42.019	2.6777	87.990	4.6615	0.1536
Probability	0.0000	0.0000	0.2622	0.0000	0.0972	0.9261
Obs.	35	35	35	35	35	35

Source: Author's computation (2017)

Table 2 shows the correlation coefficients of the variables employed for analysis. All the independent variables have weak relationships with the dependent variable, where financial deepening (FDEP), bank deposit liability (BDL), private sector credit ratio (PSCR) and stock market capitalization (SMC) reported positive correlation values while interest rate (INTR) depicted negative correlation values. The independent variables also demonstrate different level of association among themselves.

Table 2. Partial Correlation Values

	RGDP	**FDEP**	**BDL**	**PSCR**	**SMC**	**INTR**
RGDP	1.0000					
FDEP	0.0752	1.0000				
BDL	0.3014	-0.0082	1.0000			
PSCR	0.1061	0.2575	0.5072	1.0000		
SMC	0.2813	-0.2107	0.2999	0.0314	1.0000	
INTR	-0.4378	-0.0625	0.3200	0.3764	0.0949	1.0000

Source: Author's computation (2017)

4.2. Unit Root and Co-integration Test Results

The results of the stationarity tests at levels and first differenced for all the incorporated variables based on Augmented Dickey Fuller (ADF) and Phillips Perron (PP) test were presented in Table 3. The results indicated that all the variables that is real gross domestic product (RGDP), financial deepening (FDEP), bank deposit liability (BDL), private sector credit ratio (PSCR), stock market capitalization (SMC) and interest rate (INTR) were non-stationary at their level i.e. I(1) when combining all the two methods together. Thus, all the series were integrated of order one.

Table 3. Unit Root Test Results

Variables	Augmented Dickey Fuller Test (ADF)		Phillip-Perron(PP)		Remarks
	Levels	*First Difference*	*Levels*	*First Difference*	
RGDP	-1.839(2)[-3.212]	-6.098(0)[-4.263]*	-1.233(3)[-3.211]	-6.098(0)[-4.263]*	*I(1)*

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FDEP	-2.496(0)[-3.207]	-5.379(0)[-4.263]*	-2.538(3)[-3.207]	-5.882(11)[-4.263]*	I(1)
BDL	-2.043(3)[-3.215]	-6.063(5)[-4.324]*	-2.539(11)[-3.207]	-6.093(3)[-4.263]*	I(1)
PSCR	-3.306(2)[-3.558]	-7.643(0)[-4.263]*	-2.345(6)[-3.207]	-7.644(0)[-4.263]*	I(1)
SMC	-2.647(3)[-3.215]	-4.754(3)[-4.297]*	-2.301(3)[-3.207]	-8.060(0)[-4.263]*	I(1)
INTR	-2.918(0)[-3.207]	-6.585(1)[-4.273]*	-2.833(3)[-3.207]	-7.449(0)[-4.263]*	I(1)

*Note: * significant at 1%; ** significant at 5%; *** significant at 10% Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz and Akaike Information criteria.*

Source: Author's computation (2017)

Furthermore, the Johansen (1988) co-integration test was employed to test whether the linear combinations of the variables could result in a long-run relationship among the variables. The co-integration result is presented in Table 4. From the output of Table 4, it indicated that the null hypothesis of co-integrating vector is accepted at "atmost 3" co-integrating vector at 5% significance level denoting four co-integrating vector equations for both the Trace and Maximum Eigen tests.

Table 4. Co-integration Test Results

Hp: rank = p (no deterministic trend in the data)
Hr: rank r < p (co-integration relations)

Series: RGDP FDEP BDL PSCR SMC INTR				Lag interval: 1 to 3	
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**		**Max-Eigen Statistics**	
		Likelihood Ratio	**5% Sig. lev.**	**Likelihood Ratio**	**0.05 Crit. Val.**
At most 0	0.9999	541.675*	95.7537	296.850*	40.0776
At most 1	0.9952	244.825*	69.8189	165.661*	33.8769
At most 2	0.6938	79.1636*	47.8561	36.6906*	27.5843
At most 3	0.6369	42.4730*	29.7972	31.4018*	21.1316
At most 4	0.1960	11.0713	15.4947	6.76338	14.2646
At most 5	0.1297	4.3079*	3.8415	4.3078*	3.8415

* denotes rejection of the hypothesis at 5% significance level. Likelihood ratio test of both Trace and Max-Eigen indicates 4 co-integrating equation(s)

Source: Author's computation (2017).

4.3. Long-Run Estimates

The long-run estimates using the ordinary least square (OLS) method for the model is presented in Table 5. The result shows that all the indicators except private sector credit ratio have positive impact on the economic growth measured by the growth rate of real gross domestic product in Nigeria. All the indicators were in tandem with the apriori expectation except the interest rate. In magnitude, it indicates that a one percent change in financial deepening (FDEP), bank deposit

liability (BDL), stock market capitalization (SMC) and interest rate (INTR) boost the Nigerian output growth by 4.69%, 1.72%, 9.64% and 0.70% respectively. The partial significance level reported by the t-statistics indicated that all the indicators are significant at 0.05 critical value.

Table 5. Result for Long-run Estimates (RGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	343.0713	100.9181	3.399504	0.0020
FDEP	4.693788	1.669452	2.811574	0.0101
BDL	1.719391	0.851256	2.019828	0.0407
INTR	9.641723	3.648297	2.642801	0.0131
PSCR	-1.280657	1.093596	-1.171051	0.2511
SMC	0.701684	0.354805	1.977663	0.0468
R-squared	0.815174	Akaike info criterion		12.49257
Adjusted R-squared	0.697100	Schwarz criterion		12.75920
F-statistic	12.69299	Hannan-Quinn criter.		12.58461
Prob(F-statistic)	0.000020	Durbin-Watson stat		1.917810

Source: Author's computation (2017)

Furthermore, private sector credit ratio as a financial development indicator has a negative and insignificant impact on the real GDP growth of the Nigerian economy. Specifically, a 1% increase in private sector credit ratio reduces real GDP by 1.28%. The overall test shows that financial development has significant impact on the economic growth of Nigeria. The correlation of determination shows that all the financial development indicators were able to explain 69.7% changes in the real GDP growth of Nigeria. The Durbin-Watson and adjusted R-squared tests indicate that the model is not spurious.

Table 6. Higher-Order Test

Residual Normality Test		
Jarque-Bera	45.2268 Prob(J.B)	0.0000
Breusch-Godfrey Serial Correlation LM Test		
F-statistic	4.4596 Prob. F(2,27)	0.0212
Obs*R-squared	8.6909 Prob. Chi-Square(2)	0.0130
Heteroskedasticity Test: Breusch-Pagan-Godfrey		
F-statistic	0.4479 Prob. F(5,29)	0.8221
Obs*R-squared	4.2352 Prob. Chi-Square(5)	0.8472

Source: Authors' computation (2017)

4.4. Higher-Order Test

This section reports the diagnostic tests of our model. Table 6 reports the model's probability values for the Jarque-Bera statistic value to be statistically significant at

5%, which reveals that the estimated residual series are not normally distributed with zero mean and constant variance. The Breusch-Godfrey serial correlation test results also reported that we do reject the null hypothesis *"no serial correlation"* at 5% significance level, whereas for the Breusch-Pagan-Godfrey heteroskedasticity test, the result indicated that we do not reject the null hypothesis *"no heteroskedasticity"* at 5% significance level.

5. Conclusion

The study examined the impact of financial development on economic growth in Nigeria within the period of 1980-2014. The result of the stationarity tests showed that all the time series indicators were not stationary at levels. This implies that the time series variables trend with time. The co-integration result using the Johansen test indicated a long-run relationship between financial development and economic growth in Nigeria. This corroborated the findings of studies like Guryay, Safakli and Tuzel (2007), Audu and Okumoko (2013), Mba (2015), Ngogang (2015) etc. Drawing from the co-integration test, there exist a long-run relationship between financial development and economic growth in Nigeria.

Furthermore, the multiple ordinary least square estimates indicated that all the indicators of financial development except private sector credit ratio have positive impact on the economic growth in Nigeria. This supports the findings of Guryay, Safakli and Tuzel (2007), Odeniran and Udeaja (2012), Audu and Okumoko (2013), Ebiringa and Duruibe (2015), Mba (2015), Ngogang (2015) among others. The implication of this finding is that banking sector and stock market development played critical role in the output growth of the real sector. The negative impact of private sector credit indicate that provision of credit to investors do not enhance output due to high interest on loan as reported in the study. It also implies that credits are geared toward unproductive activity like buying and selling rather than investing in the development of local industries. The study therefore suggests that for the country to experience finance-led growth in Nigeria, the apex bank must ensure that loans are available to local industrial investors at a low interest rate. This will go a long way in cushioning the effects of high cost of production in Nigeria.

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Appendix: Data Presentation

YEAR	RGDP (₦'Million)	FDEP (M₂/GDP)	BDL (₦'Million)	PSCR (₦'Million)	STMC (₦'Million)	INTR (Rate)
1980	31,546.80	15.2	18,477.5	7.34	3.3	9.50
1981	205,222.10	15.3	19,477.5	8.57	2.7	10.00
1982	199,685.30	15.6	22,661.9	10.67	3.4	11.75
1983	185,598.10	16.1	26,701.5	11.67	3.7	11.50
1984	183,563.00	17.3	30,066.7	12.46	2.5	13.00
1985	201,036.30	16.6	31,997.9	13.07	5.5	11.75
1986	205,971.40	17.7	39,678.8	15.25	7.1	12.00
1987	204,806.50	14.3	49,828.4	21.08	8.3	19.20
1988	219,875.60	14.6	58,027.2	27.33	10.1	17.60
1989	236,729.60	12.0	6,4874	30.40	14.1	24.60
1990	267,550.00	11.2	82,957.8	33.55	22.2	27.70
1991	265,379.10	13.8	117,511.9	41.35	33.9	20.80
1992	271,365.50	12.7	159,190.8	58.12	47.9	31.20
1993	274,833.30	15.2	226,162.8	127.12	66.8	36.09
1994	275,450.60	16.5	295,033.2	143.42	95.4	21.00
1995	281,407.40	9.9	385,141.8	180.00	220.4	20.79
1996	293,745.40	8.6	458,777.5	238.60	302.6	20.86
1997	302,022.50	9.9	58,4375	316.21	278.7	23.32
1998	310,890.10	12.2	694,615.1	351.96	256.9	21.34
1999	312,183.50	13.4	1,070,019.8	431.17	294.1	27.19
2000	329,178.70	13.1	1,568,838.7	530.37	466.1	21.55
2001	356,994.30	18.4	2,247,039.9	764.96	648.4	21.34
2002	433,203.50	19.3	2,766,880.3	930.49	748.7	30.19
2003	477,533.00	19.7	3,047,856.3	1,096.54	1,324.8	22.88
2004	527,576.00	18.7	3,753,277.8	1,421.66	1,926.0	20.82
2005	561,931.40	18.1	4,515,117.584	1,838.39	2,523.5	19.49
2006	595,821.60	20.5	7,172,932.139	2,290.62	4,227.1	18.70
2007	634,251.10	24.8	10,981,693.58	3,680.09	10,180.3	18.36
2008	672,202.60	33.0	15,919,559.82	6,941.38	6,957.5	18.70
2009	716,949.70	38.0	17,522,858.25	9,147.42	4,989.4	22.90
2010	776332.2	20.2	17,331,559.02	10,157.02	7,913.8	22.58
2011	834,000.8	19.3	19,396,633.76	10,660.07	8,957.9	22.89

2012	888,893	19.4	21,288,14 4.39	14,649.28	9,923.9	22.94
2013	950,114	18.9	24,301,21 3.88	15,751.84	9,957.9	23.19
2014	643,235.1	19.9	27,481,53 2.65	17,128.98	10,333.9	22.51

Source: Central Bank of Nigeria Statistical Bulletin, Vol. 26, 2015