Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.7, No.19, 2016

Nigeria's Revenue Profile and Development Mesh

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Abstract
The broad purpose of the research work is to empirically ascertain the web of relationship that exists between Nigeria's revenue profile and development mesh. It goes further to investigate whether aggregate revenue proxied by various revenue sources such as total federally collected revenue, oil revenue, non-oil revenue, federation account and federal government retained revenue have any significant impact on the overall performance of the Nigerian economy. In order to embark on this exercise, annual time series data from Central Bank of Nigeria and Federal Inland Revenue Service spanning the years (1980-2014) were employed. The Johansen Co-integration test confirmed that a long run dynamic equilibrium relationship exists between economic development and various revenue sources and the Granger Causality result shows that the various revenue sources granger caused economic development in Nigeria. On the basis of our findings and conclusion thereof, and in the light of the need to encourage and promote economic development giving our huge public revenue, the government both at the national and sub-national levels sector should modify the economic policy so as to enhance the revenue generation base for increase economic development. The non-oil sectors should be harnessed to reduce the overdependence on oil and avoid the external shock resulting from the ongoing economic crisis. Government should revise its budgetary system to ensure operational and allocative efficiency.
Keywords: Revenue profile, development mesh, granger causality, unit root, co-integration, Nigeria and Error Correction Model.

1.0 Introduction

The stream of wealth that flows into the public sector coffers from the available economic activities is termed Public revenues. Barthia (2006) and Jegede (2014) disaggregated revenue receipts into routine and earned while the inflows from capital receipts includes those that are uniquely of non-routine and non-repetitive variety as well as change in government financial assets and liabilities. Government revenue in Nigeria is categorized into various sources such as oil revenue, non-oil revenue and federal government independent revenue. The federal government and its sub-national components have over the years utilized these revenues to optimize their various fiscal responsibilities, which includes the provision of infrastructure, debt servicing, social amenities as well as the judiciary etc, all geared towards economic development of the nation. There has been a mixed trend in public revenue generation since the 1980s. A little reduction was experienced between 1980 and 1986 (the pre-Structural Adjustment) period resulting in gross increase from 1986 and beyond. The increases in the public revenue base over the years have not conspicuously transmitted into economic progress and have rarely improved the much needed public goods and services in the country. The nation's general economic performance has become worrisome as it continues to register low per capita income, infrastructural decay, soaring debt overhang, and inadequate power generation, huge army of jobless youths amongst others despite the huge inflows of resources from both the oil and non-oil sectors of the Nigerian economy.

Hence, this study will help to establish the relationship between Nigeria's revenue profiles and development mesh from 1980 to 2014.

2.0 Literature Review and Theoretical Framework

2.1 Theoretical Framework

The theoretical underpinning of this work is the benefit received theory of taxation which is assumes an established web of exchange relations between those who remit tax liabilities and the government or public sectors. It is the fiduciary responsibilities of the government to provide certain public goods and services to the community and contributes to the cost of these items in relation to the maximization of the receivable benefits. This theory requires the distribution of tax according to the benefits received from the services on which the taxes are spent, and hence revenue generation can be enhanced in a country only when the tax proceeds are judiciously used in providing public goods and services. However, the benefit principle can be applied where those who benefit from the services are clearly identified. This is not true of most services provided by the government.

2.2 Nigeria's revenue profile

Oil and non-oil revenues are the major sources of government finances. The oil revenue includes proceeds from sales of crude oil, petroleum profit tax, rents and royalties while the components of non-oil revenues are companies' income tax, customs and excise duties, value-added tax and personal income tax. Since the 1970s, oil revenue has been the dominant source of government revenue, contributing over 70 percent to federally-collected revenue (CBN, 2000). Federally-collected revenue recorded substantial increase while its structure also underwent dramatic changes during the period 1970-1980, resulting from favourable developments in the international oil market. The Federation Account revenue increased sharply from N634.0 million in 1970, representing 11.3 percent of GDP to N15, 233.5million or 30.0 percent of GDP in 1980 but dropped thereafter to N12, 595.8 million or 17.2 percent of GDP by 1986 following the glut in the international oil market. The growth in gross receipts was attributable to increases in revenue from both oil and non-oil sectors. However, the oil sector has remained the dominant source of foreign exchange earnings from the mid-1970s. The contribution of oil to federally-collected revenue rose significantly from 41.4 percent between 1970 and 1972 to 73.9 percent between 1973 and 1979, and averaged over 70 percent for most of 1980s, reflecting largely the high price increases recorded from the mid-1970s, following the drop in world oil supply as a result of the Middle East crisis (CBN, 2000).

The oil price volatility of 1973 and 1974 brought about substantial windfall in foreign exchange earnings as the price per barrel of Nigeria's crude oil increased progressively from US$2.42 in 1970 to US$8.4 in 1973, and peaked at US$40.0 by 1980. Oil revenue received further boost from the second half of the 1980s upon the adoption of deregulatory measures under the Structural Adjustment Programme (SAP). Consequently, total federally-collected revenue increased sharply from N12, 595.3million in 1995 and accelerated to N582, 811.1million in 1997 before declining to N463, 608.8million in 1998. As a proportion of GDP, total federally-collected revenue was relatively stable, moving from 17.2 percent in 1986 to 18.6 percent in 1997 before declining to 16.3 percent in 1998. The total federally-collected revenue continued to increase after democratic era from 1999 which rose from N949, 187.0 million in 1999 to N7, 303,671.55 billion in 2010 and N11, 271,290.0billion in 2014.

2.4 Empirical studies

Jegede (2014) applying the ordinary least squares technique as well as t-test and f-test examined the relationship between public revenue and economic performance in Nigeria from 1980 to 2008. The empirical study concludes that public revenue effectively utilized will promote economic performance in the country. Mehrara et al (2007) in their study of 13 oil exporting countries including Nigeria established the existence of threshold on output of these countries from 1965 to 2005. Applying the panel data regression analysis the results suggests the existence of threshold beyond which oil contribute negatively to growth.

In the empirical study of Rewane (2007) investigated oil revenue impact on Nigeria's credit position, debt exposure and its sustainability from 1973 to 2004. He opined that the country's development aspiration is hindered by the inefficient utilization of oil revenues. Mahdavi (2008) applied panel data regression analysis to estimate revenue data for 43 developing nations spanning 1973 to 2002 including Pakistan. The fascinating results revealed that agricultural sector has positive relationship with public revenue while aid and non-tax revenue have negative impact. Hence, he concludes that in order to boost revenue the agricultural sector should be given priority.

Ogbonna & Appah (2012) using time series analysis and employing the scope (1981-2007) empirically investigate the impact of tax reform on economic growth in Nigeria. Because the time series variables were non-stationary at levels, they employ the method of co-integration and error correction modeling. The use of Augmented Dickey Fuller showed that the variables were stationary after first differencing. The partial stock adjustment model was used in estimating the ECM. The result shows that changes in all the income taxes have positive coefficients. This implies that tax reform will stimulate economic growth.

Oriakhi & Ahuru (2014) in an empirical work captioned "the impact of tax reform on Federal revenue generation in Nigeria" used annual time series data spanning the years (1981 - 2011) and employed various income taxes as proxy for tax reforms. By way of preliminary test, the Augmented Dickey Fuller test was employed to test for the unit root. The entire time series variable were non-stationary at levels but became stationary after first differencing. The Johansen's co-integration test employed showed that long-run relationship exists between tax reform and federally collected revenue in Nigeria. The partial stock adjustment model shows that the various income taxes are statistically significant and have positive relationship with federally collected revenue. The coefficient of the error correction model showed that 66.2940 percent of the deviation of federally collected revenue from its long-run equilibrium value can be reconciled yearly. The study showed that tax reform by improving the tax system and reducing tax burden enhances the ability of the government to generate more revenue.

From the above empirical literature, it can be observed that there is no specific study on the nexus of

Nigeria's revenue profile and development mesh. Hence this research is undertaken to establish the link and assess the trend between Nigeria's revenue profile and development mesh between 1980 and 2014.

3.0 Methodology

The study is designed in such a manner that requires an econometric investigation of the relationship between Nigeria's revenue profile and development mesh, using Augment Dickey Fuller (ADF) test, Granger Causality test, Johansen test and error correction model (ECM). The data for the study were obtained mainly from secondary sources, particularly from the Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics

3.1 Model Specification

The model of this study which is based on the benefit received theory of public revenue and is developed to access the dynamic relationship between aggregate revenue and economic development in Nigeria between 1980 and 2014. The model is specified below:

RGDP = F (TFCR, OIR, NOIR, FA, FGR) - - - - - - (1)

The above equation can be re-specified in a stochastic form as:

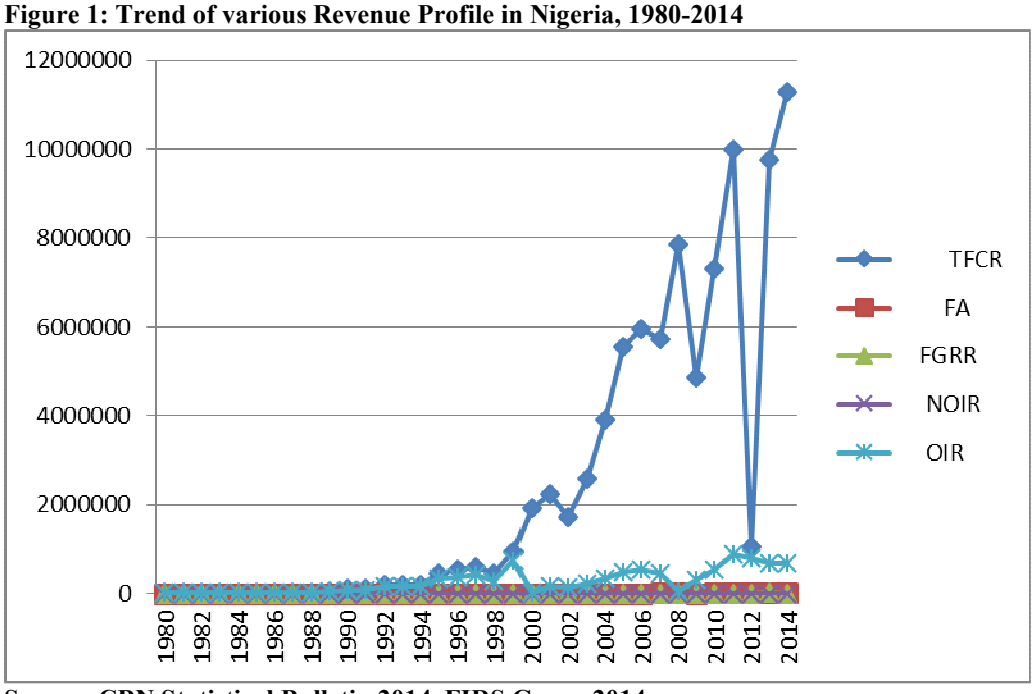
$RGDP = \beta_0 + \beta_1 TFCR + \beta_2 OIR + \beta_3 NOIR + \beta_4 FA + \beta_5 FGRR + ui$ - - (2)

Where:

RGDP = real gross domestic product as a proxy for economic development
TFCR = total federally-collected revenue
OIR = oil revenue
NOIR = non-oil revenue
FA = federation account
FGRR = federal government retained revenue

4.0 ANALYSIS AND DISCUSSION OF FINDINGS

Figure 1: Trend of various Revenue Profile in Nigeria, 1980-2014



Source: CBN Statistical Bulletin 2014, FIRS Gauge 2014

In figure 1 above, it indicates that the total federally-collected revenue (TFCR) exhibit upward trend during the period under review. Most of the revenue generated came from oil revenue (OIR). The non-oil revenue (NOIR) plummeted during and after the oil boom. The slump in non-oil revenue and other revenue sources is occasioned by the neglect of the agricultural sector.

4.2 Analysis of Regression Results

4.2.1 Unit Root Test

In ascertaining the characteristics of time series variables, a preliminary analysis is to test for the presence of unit root in the series. This is important since we are ignorant of the data generating process. The Augmented Dickey Fuller (ADF) unit root test was applied and the result shown in table 1 below:

Table 1: Summary of ADF Unit Root Test (At 0.05 Critical Levels)

VARIABLE	AT FIRST DIFF	DECISION
DRGDP	-3.835659	I(1)
DOIR	-4.400387	I(1)
DNOIR	-4.503053	I(1)
DFA	-3.542934	I(1)
DFGRR	-3.581927	I(1)
DTFCR	-4.992180	I(1)

Source: Authors' Computation using E-views

The empirical results of the unit root test using Augmented Dickey Fuller at 5 percent level indicates that all the variables were not stationary at levels but became stationary after first differencing, hence the variables have unique order of integration. This conclusion is based on comparison of the Augmented Dickey Fuller statistics and the critical values provided by Mackinnon (1996). Hence, this permit us to carry out the Johansen's co-integration test designed to determine whether a common stochastic drift exist among our time series variables.

4.2.2 Johansen's Co-integration Test

Series: RGDP TFCR OIR NOIR FA FGRR

Table 2(a)Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen-value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.959153	249.0188	107.3466	0.0000
At most 1 *	0.833558	143.4876	79.34145	0.0000
At most 2 *	0.704470	84.31498	55.24578	0.0000
At most 3 *	0.614915	44.08847	35.01090	0.0042
At most 4	0.246130	12.59684	18.39771	0.2670
At most 5	0.094427	3.273188	3.841466	0.0704

Trace test indicates 4 co-integrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Table 2(b): Unrestricted Co-integration Rank Test (Maximum Eigen-value)

Hypothesized No. of CE(s)	Eigen-value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.959153	105.5312	43.41977	0.0000
At most 1 *	0.833558	59.17260	37.16359	0.0000
At most 2 *	0.704470	40.22651	30.81507	0.0027
At most 3 *	0.614915	31.49163	24.25202	0.0047
At most 4	0.246130	9.323650	17.14769	0.4625
At most 5	0.094427	3.273188	3.841466	0.0704

Max-Eigen-value test indicates 4 co-integrating equation(s) at the 0.05 level

The above co-integration results in table 2(a & b) on the relationship between RGDP and OIR, NOIR, TFCR, FA, FGRR based on the trace statistic and maximum Eigen values show that the variables are co-integrated at 5 percent level of significance since there are four co-integrating vectors, respectively. Hence, there is a meaningful long-run relationship among the variables in the model.

4.2.3 Pair wise Granger Causality Test

To determine the pattern of causality among all the variables in the model, we employ the pair wise Granger Causality test as shown in the tables below.

Table 3: Pair-wise Granger Causality Tests for RGDP TFCR OIR NOIR FA FGRR
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
TFCR does not Granger Cause RGDP	34	11.4990	0.0019
RGDP does not Granger Cause TFCR		16.2290	0.0003
OIR does not Granger Cause RGDP	34	4.24019	0.0480
RGDP does not Granger Cause OIR		9.57285	0.0042
NOIR does not Granger Cause RGDP	34	8.31017	0.0071
RGDP does not Granger Cause NOIR		5.78402	0.0223
FA does not Granger Cause RGDP	34	10.3894	0.0030
RGDP does not Granger Cause FA		6.37711	0.0169
FGRR does not Granger Cause RGDP	34	23.0303	4.E-05
RGDP does not Granger Cause FGRR		0.01656	0.8984

Source: Authors' Computation using E-views

The Granger Causality test for the causality between real gross domestic product and revenue profile as presented in table 3 above reveals that total federally collected revenue (TFCR) with p-value of 0.0019 less than the critical value of 0.05, which implies the acceptance of the null hypothesis and the rejection of the alternative hypothesis shows that total federally collected revenue (TFCR) in Nigeria does not granger cause real gross domestic product and vice versa. The table equally shows that oil revenue (OIR), non-oil revenue (NOIR) and federation account (FA) do not granger-cause real gross domestic product (RGDP) while Federal government retained revenue (FGRR) granger cause real gross domestic product (RGDP) and Real gross domestic product in turn granger cause Federal government retained revenue (FGRR).

4.2.4 Table 4: Error Correction Estimates for RGDP and Revenue Profile Dependent variable: RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	0.920696	0.152842	6.023826	0.0000
TFCR	0.000955	0.000447	2.136104	0.0435
TFCR(-1)	0.000973	0.000378	2.572659	0.0170
OIR	0.002725	0.003575	0.762260	0.4537
OIR(-1)	0.003615	0.003728	0.969700	0.3423
NOIR	7.687799	4.385931	1.752832	0.0930
NOIR(-1)	7.851494	4.249240	1.847741	0.0775
FA	5.591131	2.005263	2.788229	0.0104
FGRR	0.016809	2.545631	0.006603	0.9948
ECM(-1)	-0.753010	0.279533	-2.693816	0.0130
C	384.9389	855.1024	0.450167	0.6568
R-squared	0.992970			
Adjusted R-squared	0.989913			
F-statistic	324.8553	Durbin-Watson stat		1.924275

Source: Authors' Computation using E-views 8

The above table 4 indicates the results of the error correction estimates between the dependent variable real gross domestic product (RGDP) and the independent variables such as total federally collected revenue (TFCR), oil revenue (OIR), non-oil revenue (NOIR), federation account (FA), and federal government retained revenue (FGRR) with adjusted coefficient of determination put at 0.989913, showing that about 98 percent of the real gross domestic product is accounted for by the various revenue sources, leaving only 2 percent for the unexplained variables not captured in the estimated model. Hence, judging from the R-Squared and Adjusted R-Squared values, the estimated model has high explanatory power and appreciable goodness of fit. The explanatory variables are rightly signed indicating positive relationship between economic growth and the various revenue sources in Nigeria. Similarly, the coefficients of the one year lagged value of the dependent variable and non-oil revenue are statistically significant at 5 percent alpha level. Importantly, the speed of

adjustment from short-run to long-run equilibrium put at -0.753010, which is both negative and statistically significant as showed by the error correction model (ECM) indicates that 75.3010 percent of the deviation in real gross domestic product can be reconciled annually. The Durbin-Watson statistic which is used to test for the absence of autocorrelation in the model shows that the value of DW statistic (1.924275) falls in the no autocorrelation region and hence we can conspicuously ascertain that autocorrelation do not exist.

5.0 CONCLUSION AND RECOMMENDATIONS

The main objective of this study is to empirically ascertain the relationship between Nigeria's revenue profile and development mesh. It goes further to investigate whether aggregate revenue proxied by various revenue sources such as total federally collected revenue, oil revenue, non-oil revenue, federation account and federal government retained revenue have any impact on the overall performance of the Nigerian economy. In order to embark on this exercise, annual time series data from Central Bank of Nigeria and Federal Inland Revenue Service spanning the years (1980-2014) were employed. The Johansen Co-integration test confirmed that a long run dynamic equilibrium relationship exists between economic development and various revenue sources, and the Granger Causality result shows that the various revenue sources except federal government retained revenue does not granger caused economic development in Nigeria. On the basis of our findings and conclusion thereof, and in the light of the need to encourage and promote economic growth giving our huge public revenue, there is the need for the government to revise its macroeconomic policies to improve on the revenue generation base for enhanced economic development in the country. The non-oil productive sectors should be diversified. This will reduce the overdependence on oil and avoid external shock as a result of the ongoing crisis in the international oil market. Government need to revise its budgetary system toward effective and efficient use of its public revenue so as to have a robust economic development.

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FA	FGRR	NOIR	OIR	RGDP	TFCR	ECM
14.75	12.99	2.88	12353.3	94.33	15223.5	3626.486
10.18	7.51	4.73	8564.4	101.01	13290.5	2479.599
9.88	5.82	3.62	7814.9	110.06	11433.7	1126.968
9.85	6.27	3.26	7253.6	116.27	10508.7	-770.415
10.67	7.27	2.98	8269.2	134.59	11253.3	-1050.35
13.75	10.46	4.13	10923.7	134.61	15550.4	-702.958
11.87	7.97	4.49	8107.3	193.13	12595.5	-701.946
24.69	16.13	6.35	19027.4	263.29	25380.6	298.1243
26.77	15.59	7.77	19831.7	382.26	27596.7	737.9832
46.86	25.89	14.74	39130.5	472.65	53870.4	2595.163
68.06	38.15	26.22	71887.1	545.67	98102.4	152.3016
54.37	30.83	18.33	82666.4	875.34	100991.6	-879.9
77.83	53.26	26.38	164078.1	1089.68	190453.2	-595.134
106.86	126.07	30.67	162102.4	1399.72	192769.4	-3492.84
110.46	90.62	41.72	160192.4	2907.36	201910.8	-1133.94
162.26	249.77	135.44	324547.6	4032.33	459987.3	3623.678
179.12	325.14	114.81	369190.3	4189.25	523597.5	2834.619
208.40	351.26	166.41	416811.1	3989.45	582811.1	1896.217
257.33	353.72	139.33	289532.3	4679.21	463608.8	-505.052
576.81	662.59	224.77	724421.2	6713.57	949187.4	364.2849
1262.47	597.28	314.48	15916.8	6895.22	1906160.2	-853.693
1427.43	796.98	903.46	170756.4	7795.76	2231600.1	-1199.03
1606.12	716.75	500.99	123085.2	9913.52	1731838.6	-643.982
2011.59	1023.24	500.82	207428.3	11411.07	2575096.5	863.1935
2657.23	1253.61	565.71	335480.1	14610.88	3920500.5	539.7658
3033.91	1660.75	785.11	476240.3	18564.59	5547500.4	644.5969
3219.12	1836.61	677.54	528757.5	20657.32	5965102.8	-2517.42
3878.56	2333.66	1264.62	446291.6	24296.33	5715600.9	-151.489
4552.84	3193.44	1336.12	53060.1	24794.24	7866590.3	-10732.3
3600.07	2642.98	1652.65	319194.6	54204.82	4844592.8	2075.15
4784.47	3089.18	1907.58	539609.9	63258.58	7303672.5	-2384.27
6158.45	3553.54	2237.88	887897.3	71186.53	9987629.4	-6100.83
6565.24	3629.61	2628.78	802597.4	80222.13	1065472.0	6.05E-07
7488.36	4031.83	2950.56	680923.6	86556.14	9759800.3	1400.325
7540.34	3599.63	3275.12	679372.2	105675.86	11271290.1	9157.113

SOURCE: CBN, VARIOUS ISSUES