Fiscal Policy and Diversification in Nigeria: A Time-Series Analysis

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Abstract

This paper analyses efficacy of fiscal policy for diversification in Nigeria. In addition, it examines the average impact of economic growth on the diversity index by employing time series data covering the period from 1980 to 2015. It adopts the Phillips-Perron (PP) unit root test to ascertain order of integration of the series whilst the possibility of long-run relationship among the variables is ascertained using the Wald Test. The Ordinary Least Squares (OLS) estimation reveals a significantly positive relationship between the index of diversification and each of petroleum profit tax, capital expenditure, and fiscal freedom in the country. Thus, it concludes that fiscal policy variables are effective for driving diversification in Nigeria. It, however, suggests that the government should strengthen its strategy for collecting the petroleum profit tax. Also, the government should direct capital spending to the provision of infrastructural facilities to boost manufacturing exports. Finally, a strong and independent institution for fruitful diversification process is recommended.

Keywords: Diversification, ECM, fiscal policy, government expenditure, tax revenue

JEL classification codes: E62

1. Introduction

A necessary step towards achieving sustainable growth and development in Nigeria is the diversification of the economy. Economic diversification in Nigeria is, however, only possible in the form of generating revenue from a source different from oil. Such a different source could be tax, a fiscal variable. Over the years in Nigeria, the tax system has been designed as a strategy to help grow investment, create employment, and maintain stable revenue flow for sustainable government expenditure and adequate infrastructure[1]. However, notwithstanding the viability of tax as a source of stable revenue for an economy, the trend in total revenue from tax has been on the decline in Nigeria. For example, in 2012, the tax revenue and grants as percentage of GDP dropped to 14.8 per cent from 25.3 per cent in 2005. Some of the factors claimed to be responsible for the decline included poor economic management, corruption and the narrow tax base in the country. Also, it was discovered recently that several billions of Naira were hanging uncollected due to tax evasion by some 363,000 companies[2] coupled with a 12 per cent level of compliance in value added tax (VAT) revenue collection in the country. But then, apart from targeting 10 per cent government revenue of GDP from the present 5 per cent, the Buhari's administration claimed to be tackling the problems through the framework of fiscal discipline, targeted investment, growth of the non-oil sector, and diversification of the economy.

Moreover, the foregoing follows from the unsuccessful efforts by different governments in Nigeria to diversify the Nation's economy and reduce the country's dependence on oil. Essentially, a giant leap taken by the country towards diversification was in the Third National Development Plan (1975-1980) where the cardinal objective, amongst others, was diversification of the economy. However, due to over-reliance on the relative large amount of revenue collected from oil over the years, all efforts at diversifying the economy remained in the books. Unfortunately, in recent times, growth in the oil sector has been gloomy recently as it was 3.4 per cent, -2.3 per cent and 5.3 per cent in 2011, 2012 and 2013[3], respectively. Also, crude oil's share of

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[1] Federal Ministry of Finance (2012)
[2] ThisDay Live (2016)
[3] African Economic Outlook (2014)

government revenues declined and hovered around 70 per cent and 67.12 per cent between the period 1988 and 2014. Specifically, as percentage of GDP, oil revenue dropped from 21.3 per cent in 2005 to 11.1 per cent in 2012[4]. Consequently, total Federal Government Retained Revenue as percentage of GDP reduced to ₦3.63 trillion or 8.95 per cent in 2012, from 13.14 per cent in 2008[5]. Yet, in effect, the reliance of state governments on revenue allocation from the central has dampened the will and efforts at generating revenue from within the states as total internally generated revenue (IGR) for the 36 states dropped to ₦682.67 billion in 2015 from ₦707.85 billion in 2014[6]. The decline, invariably, could be ascribed to over-dependence on oil- revenue, as well as drop in the international price of oil from, for example, USD114/barrel in June 2014, to USD38.0 in December 2015 and further to USD31.4 in February, 2016[7].

Several opinions relating to achieving diversification in oil-dependent economies[8], and Nigeria[9] in particular, have been expressed in the literature. The conclusions of the opinions have been that agriculture and tourism could specifically propel diversification in Nigeria. However, despite the vibrancy of such conclusions, yet a policy militating factor is that export-mix dominated by commodity products cannot guarantee fruitful diversification in Nigeria. This is because commodity prices are highly volatile, they are major sources of trade shocks, and unreliable[10]. More so, tourism in Nigeria is not yet developed to the internationally accepted standard considering the lack of constant power supply, security, transportation and good roads. However, very imperative is the fiscal potency of tax revenue and government expenditure for a successful diversification. Where prospective taxes are collected efficiently as at when due, and such funds are utilized in providing infrastructural

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[4] UNCTAD (2015)

[5] Teriba (2016)

[6] The Punch (2016)

[7] Kale (2016)

[8] See, for example, Rodrik (2005), Hausmann and Rodrik (2006), Hausmann, Hwang and Rodrik (2007), and Al-Kawaz (2008)

[9] Eko, Utting and Unonl (2013), and Uzonwanne (2015)

[10] As currently being experienced by Nigeria since 2015 when per barrel price of oil declined

facilities like electricity, output from the manufacturing sub-sector would be boosted. Thus, considering the discussions relating to economy diversification in Nigeria, it shows to the best of our knowledge that, there is no study that has considered the efficacy of fiscal policy in driving export diversification in the country. Thus, given its objective, this study examines the effect of fiscal variables on export diversification in Nigeria over the period 1981-2014. The period is chosen because it covers the era when several fiscal policies are introduced and implemented in the country.

Furthermore, given the desire of the Nigerian government for sustainable growth and development through economic diversification in the country, this study finds a significant premise. As such, the fiscal contribution of multinational enterprises (MNEs) forms an important revenue source for governments, and a factor for critical resource mobilization for diversification[11]. In essence, this study proffers some policy suggestions that would sensitize the government on the viability of fiscal variables to drive export diversification in Nigeria.

The rest of the paper is divided as follows. Section two presents overview on fiscal operations in Nigeria. Section three reviews relevant l iterature, and section four provides the methodology. Results and presented and discussed in section five, while section six concludes with policy implications.

2. Overview of Fiscal Operations in Nigeria

Towards the tail end of the immediate past decade through early 2010, prudent macroeconomic policies which included fiscal policy that was aimed at increasing the quality and efficiency of spending have been maintained in Nigeria. In the process, measures were put in place to plug revenue leakages. These included forensic audit of the Nigerian National Petroleum Corporation (NNPC) and process audits of internally generated remittances from ministries, departments and agencies (MDAs). In addition, the measures were enhanced in 2011 with the issuance of directive to more than 32 parastatals, including the Central Bank of Nigeria (CBN), the Federal Inland Revenue Service and other revenue-generating agencies, to submit their budget to the National

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[11] World Investment Report (2015)

Assembly in line with the provision of the Constitution and the Fiscal Responsibility Act. Expectedly, domestic-revenue mobilisation improved as tax revenue rose to 6.9 per cent of GDP in 2009 as embedded in Figure 1 below.

Furthermore, whilst setting the fiscal deficit within the threshold of 3.0 per cent, the fiscal policy stance was focused on achieving fiscal consolidation and inclusive growth. In essence, the medium-term fiscal strategy was reoriented towards reducing recurrent expenditure for capital expenditure. Thus, the share of recurrent expenditure in the total budget was reduced from 74.4 per cent in 2011 to 71.4 per cent in 2012 and 68.7 per cent in 2013, whilst the share of capital expenditure was increased from 25.6 per cent in 2011 to 28.6 per cent in 2012 and 31.3 per cent in 2013. The increase in the capital spending was expected to improve the stock of physical infrastructure, as well as providing firmer platform for future growth.

Meanwhile, some reforms were introduced on the country's fiscal policy which culminated into the adoption of The Medium Term Expenditure Framework (MTEF) in 2004 by the Federal Government of Nigeria. MTEF is a broad-based budgetary framework expected to assist the government in achieving macroeconomic balance, and sustainability of government funding. Also, as part of the reforms, The Fiscal Responsibility Act was enacted in 2007 with the major objective of ensuring proper co-ordination and transparency in government financial management. It provides for the Medium-Term Fiscal Framework (MTFF), Commodity Price-Based Fiscal Rule, Limits on Consolidated Debt and Borrowing, Fiscal Transparency, and Fiscal Management Council. In addition to the enactment of 2007 was The Public Procurement Act meant to ensure accountability, competitiveness, professionalism, and transparency in public procurement. Furthermore in 2011, in order to give constitutional backing to the sovereign wealth fund (SWF), and put an end to the existence of excess crude account, The Sovereign Investment Authority Act was passed. The fund was meant to provide alternative sources of revenue for development, ensure stability of oil revenue, and provide savings for future generation[12]. Yet, a key challenge to Nigeria's sustainable development in the recent time is the diversification of the country's export mix[13].

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[12] African Economic Outlook (2014)
[13] CBN (2013)

Figure 1: Tax revenue and public expenditure in Nigeria, 1981-2014
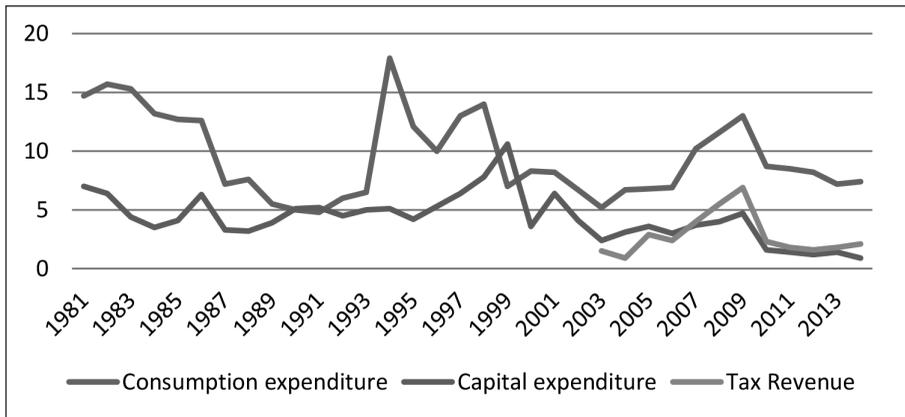
Source: Authors' representation using data from CBN (2015)

3. Relevant Literature

3.1 Fiscal Policy

Fiscal policy is the action plan of government, regarding revenue generation and expenditure, adopted to monitor and influence economic activity. It is important in economic management viv-a-vis government's role of achieving certain macroeconomic objectives of price stability, economic growth and balance of payments equilibrium, among others. In the traditional parlance, fiscal policy is taken as instrument of demand management, as changes in tax and expenditure are used as counter–cyclical measures for reducing the impacts of business cycle in the economy.

3.2 Diversification

Diversification may be viewed as a broad societal process in which an economy is transformed from depending on one source of income[14], to a society generating income from multiple sources across the primary, secondary and tertiary sectors, and where majority of the population participate[15]. Although

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[14] An example of such country is Nigeria where oil and gas sector is dependent on as the single source of income.

[15] Hvidt (2013)

diversification has been conceptualised, in the early literature[16], merely as the creation of manufacturing outfit, however, the aim of the concept is the spreading of risk by creating variety of income sources. Similar analogy relates to macroeconomics where diversification refers to switching to policies that aim at reducing a country's dependence on a limited number of export commodities, domestic output, or major revenue source that may be subjected to price volatility and trade shocks[17].

Also, diversification may be horizontal, in the form of seeking new opportunities for new products within the same industry or sector such as energy, agriculture and mining. It can also be vertical or diagonal which involves expanding the stages or phases of processing domestic or imported inputs. This encourages forward and backward linkages in the economy, as the output of one activity becomes the input of another, thereby upgrading the value-added produced locally[18]. Generally, a vertical diversification entails shift of major economic activities to the manufacturing or service sector from the extractive sector. By implication, through diversification, countries enjoy inter-linked macro objectives in the form of value addition, increased income and stabilized revenue.

More importantly, diversification can be categorised majorly into export diversification and product diversification. Export diversification is the deliberate efforts put products into the export portfolio, and break into new products markets. Product diversification, on the other hand, involves a situation in which an economy becomes more diverse in the production of goods and services. Nevertheless, each type of diversification, if well implemented, would drive economic growth, create productive investment-friendly environment, and reduce, if not eliminate, short-term macroeconomic instability.

3.1.1 Measuring Diversification

There is no generally accepted measure for diversification. The reason, apart from regional economy size,[19] is due to different economic conditions

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[16] See, for example, Looney (1994)
[17] Routledge Encyclopedia (2001)
[18] Hirschman (1958, 1969)
[19] Raj Sharma (2008)

with respect to data availability over a long-period, as well as the number of industries included in the computation of the index across countries or regions[20]. But then, a particular measure can be used to evaluate diversity index for the economy as a whole.

However, some measures are put forward across literature. For example, there is a composite diversification index by the United Nations Conference on Trade and Development (UNCTAD). The measure is composed of GDP, concentration index for export, industry share of labour force, and electricity consumption per capita per year[21]. Also, Gnidchenko (2010) notes some measures of diversification that are grouped into four by Wagner (2000) as: equiproportional, type of industries, portfolio, and input-output. The equiproportional group measures economic diversity and it includes Entropy index, Herfindahl index, and National average index (NAI). The industry groupings comprise the Location quotient used for assessing specialization, and the computation of Hachman index. The most commonly employed measures in empirical studies are the equiproportional indices due to limited data requirement and ease of computation[22]. The equiproportional measures are, however, limited in their use because, the selection of equal distribution activities is arbitrary[23]; the number of industries is fixed; and it does not account for inter-industry linkages[24]. The other groupings are, to a large extent, militated in application by the lack of data, especially in developing countries.

Furthermore, some measures that are restricted to oil producing countries like the Gulf Cooperation Council (GCC) are also highlighted by Hvidt (2013). These include the structural change in the economy as reflected by percentage to GDP contribution of the oil sector, as against non-oil sectors; the share of oil revenue as percentage of total government revenue which shows oil revenue dependence; the percentage share of non-export to total exports' earnings; the relative contributions of private and public sectors to GDP which indicates private sector-driven diversification; and the relation of

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[20] Gnidchenko (2010)
[21] Al-Kawas (2009)
[22] Tran (2011)
[23] Brown and Pheasant (1985)
[24] Wagner and Deller (1998)

GDP instability to oil price volatility. The main constraint to assessing these measures, aside from non-availability of data, is volatility in oil prices[25].

Thus, given the above exposition on the measures of diversification, the UNCTAD measure has more advantages than the others: the index is easy to compute and widely used.

3.1.2 Brief Empirical Literature

While applying Entropy index, Attaran (1986) examined the correlation between diversity and economic performance for the 51 states and District of Columbia in U.S. over the period from 1972 to 1981. The study found a negative correlation between growth rate of per capita income and diversity in all the locations. By implication it means that lower diversity associated with higher per capita income in all the states and district. In review, however, a consideration of additional variables such as taxes and expenditure would have availed Attaran (1986) a more robust results that would probably show positive correlations between income and growth in some of the states.

Also for the entire U.S., Wagner and Deller (1998) use regional input-output model[26] to examine the relationship linking diversity with economic growth in the 50 states for the period 1969-1991. The result suggests that economic growth increases in tandem with higher level of diversity as diversification enhances stability across the states[27]. Essentially, economies are more diversified as level of income improves (see, e.g., Imbs & Wacziarg, 2003). This view, however, has earlier been stressed by Izraeli and Murphy (2003) in the analysis on the impact of industrial diversity on per capita income and unemployment in the U.S. during the period 1970-1997. In corroboration with Maliza and Ke (1993), amongst others, the Herfindahl index-based analysis reveals strong relationship between industrial per capita income and diversity. In review, since Izraeli and Murphy (2003) employed the technique of panel data for analysis, stationarity test ought to be conducted on the series to avoid spurious results.

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[25] Looney (1994)

[26] See also, Al-Kawaz (2008) for variant of the input-output model

[27] The finding supports Kort (1981), Trendle and Shorney (2004), Mizuno et al. (2006), Garrett, Wagner and Wheelock (2007), and Raj-Sharma (2008). A similar study on industrial diversity and economic growth is that of Tran (2011).

Hasan and Toda (2004) examine empirical distinction between vertical and horizontal diversification in Bangladesh, Nepal, and Malaysia by computing five different measures for export diversification and elimination of commodity prices volatility. The study finds that creation of new innovative commodities is necessary for low-income countries for the development of vertical diversification. By implication, export mix in such countries needs alteration in the long-run for horizontal diversification to be stimulated. The findings to a large extent supports the view of Klinger and Lederman (2004) that economic structure of developing countries tends more towards manufacturing and product diversification as they advance to higher stage of development[28]. Hesse (2008) affirms positive impact of export diversification on economic growth at least in the following ways: knowledge spillovers from value addition to existing goods; enhancing growth of output through forward and backward integrations; and reduction of volatility of export earnings.

4. Methodology

Following suggestions in the literature that macroeconomic and institutional policy variables influence the diversification process coupled with the commodity-based and public sector-driven nature of the Nigerian economy, therefore, UNCTAD's export diversification index is used as the dependent variable. In order to capture fiscal influence on diversification, tax revenue and government expenditure are used. Thus, value added tax, *Vat*; non-oil tax, *Not*; petroleum profit tax, *Ppt*; capital expenditure, *Cxp*; and government final consumption expenditure, *Fxp* are employed as regressors. Other independent variables used are fiscal freedom, *Ffr* which captures institutional effect; and real GDP, *Rgdp,* as control variable. In addition, the study employed ordinary least squares (OLS) method, the coitegration technique of Johansen (1988) and Johansen and Joselius (1990), as well as the Phillips-Perron (PP) (1988) unit root test approach to ascertain the stationarity of the data series. The causal relation between fiscal variables and diversification is ascertained through Engle and Granger (1987), and Granger (1988) causality test.

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[28] See also Hausman, Hwang and Rodrik (2007), and United Nations International Development Organization (2009) for strong evidence that manufacturing diversification matters for economic performance.

4.1 Variable Description, Measurement and Data Source

Tax revenue, which comprises non-oil tax revenues, VAT, and PPT, is defined as the public income which refers to compulsory levy and transfers from individuals to the central government for public purposes. However, certain compulsory transfers such as fines, penalties, and most social security contributions are not included. Also, refunds and corrections of erroneously collected tax revenue are treated as negative revenue. Studies which have examined the relationship between tax benefit and diversification include Wetland (2016) who establishes a positive linkage between the two variables. Each of the revenue is measured as percentage of GDP. Data for the series are collated from Government Finance Statistics Yearbook and data files of International Monetary Fund (IMF), as well as World Bank and OECD GDP estimates.

General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure on national defence and security, but excludes government military expenditures that are part of government capital formation. Capital expenditure is government spending on revenue generating and/or long-term fixed assets. Both forms of expenditure are measured individually as percentage of GDP. Data are gathered from Central Bank of Nigeria (CBN) and World Bank.

Real GDP as proxy for economic growth is the GDP based on constant 2011 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Wagner and Deller (1998) established a high per capita income with low rate of diversity index. Data for the variable were sourced from World Bank development research group and the Central Bank of Nigeria.

Fiscal freedom as a proxy for institutional quality, measures the tax burden imposed by the government. It is one of the ten components of economic freedom which describes the fundamental right of an individual to

control his or her own labour and property. Fiscal freedom is graded on a scale of 0 to 100. A score closer to 100 implies the level at which individual is free from government tax burden. Data for the index were taken from Heritage Foundation data base.

4.2 The Model

Given the theoretical and empirical postulations describing the relationships connecting diversification, tax revenue, government expenditure, and other macroeconomic and institutional variables, the below expressions in functional and linear transformation forms in (1) and (2), respectively are specified to capture the average impacts of each of the right-hand-side variables on diversification in Nigeria. Theoretically, the expressions toed the line of Easterly (2004), whilst it followed Attaran (1986), Wagner and Deller (1998), Izraeli and Murphy (2003), Jaumotte and Spatafora (2007), and Wetland (2016) at the empirical front. Thus,

$$DI_t = f(Vat_t, Non_t, Ppt_t, Cxp_t, Fxp_t, lRgdp_t, Ffr_t) \tag{1}$$

$$DI_t = \beta_0 + \beta_1 Vat_t + \beta_2 Not_t + \beta_3 Ppt_t + \beta_4 Cxp_t + \beta_5 Fxp_t + \beta_6 lRgdp_t$$
$$+ \beta_7 Ffr_t + u_t \tag{2}$$

where β_0 is the equation constant term, β_i, $i = 1,...,7$, are the parameters, while t is time, and u is the error term. Definitions of variables are as given above. By expectation, $\beta_1, ..., \beta_7 > 0$.

Furthermore, given the establishment of a long-run association among the series, thus expressions (3) and (4) below specify the estimation procedure for short run adjustments using the error correction mechanism (ECM) as follows:

$$\Delta X_t = \delta_0 + \delta_1 e_{t-1} + \sum_{i=1}^{m} \delta_i \Delta X_{t-i} + \sum_{j=i}^{n} \delta_j \Delta Y_{t-j} + e_t \tag{3}$$

$$\Delta Y_t = \varphi_0 + \varphi_1 \mu_{t-1} + \sum_{i=1}^{m} \varphi_i \Delta Y_{t-1} + \sum_{j=i}^{n} \varphi_j \Delta X_{t-j} + \mu_t \tag{4}$$

where e_{t-1} and μ_{t-1} are the error-correction terms as lagged residuals from the cointegrating relations. Using the OLS method, e is the value of the residuals from the regression of x on y and μ is the value of the residuals from the

regression of y on x. The error correction terms essentially capture the speed at which the short-run adjusts to the long-run equilibrium. As such, equations (3) and (4) allow the test for both short-run and long-run causality between each pair of the variables. Following Engle and Granger (1987), x does not Granger cause y if $\phi_1 = 0$ and $\phi_i = 0$, for all i. Similarly, y does not Granger cause x if $\delta_1 = 0$ and $\delta_j = 0$, for all i. More importantly, the existence of long run causality is implied by the negatively significant values of the coefficients of the error correction terms.

5. Empirical Results and Discussion

The results of preliminary tests and model estimations conducted are reported in this section. The unit root test result in Table 1 reveals that all the series are integrated at first difference, that is, I(1). Also, the lag order selection criteria in Table A3 in the appendices selects 2 as the lag length for analysis based on Akaike (1969) information criterion. Affirmation of long-run relationship among the variables is presented in the Johansen cointegration test; and Wald test results in Tables A1, A2; and A4, respectively.

Table 1. Phillips-Perron unit root test results

Variable	Stage	Critical Value	1%	5%	10%
DI	1st Difference	-6.0024	-2.6369	-1.9513	-1.6108
Vat	1st Difference	-6.0927	-2.6369	-1.9513	-1.6108
Not	1st Difference	-6.2555	-2.6471	-1.9529	-1.6100
Ppt	1st Difference	-6.0774	-2.6417	-1.9521	-1.6104
Cxp	1st Difference	-6.6151	-3.6443	-2.9525	-2.6102
Fxp	1st Difference	-8.0939	-2.6369	-1.9513	-1.6108
lRgdp	1st Difference	-8.1677	-2.6369	-1.9513	-1.6108
Ffr	1st Difference	-4.2139	-2.6369	-1.9513	-1.6108

Source: Authors' computation

Table 2 provides the result of the pairwise Granger-causality tests. For the reason that statistical decisions are based on 5 per cent level of significance, thus causality flows in one direction from each of capital expenditure, general government final consumption expenditure, and petroleum profit tax to diversification index. Furthermore, the parsimonious resu of the model, as presented in Table 3, shows a dynamic characteristic of the relationship linking the dependent variable and the independent variables.

Table 2. Granger causality test results

Null Hypothesis	F-statistic	Probability	Decision
Cxp does not Granger cause DI	6.13782	0.0241	Reject
DI does not Granger cause Cxp	0.86045	0.1186	Accept
Fxp does not Granger cause DI	5.28557	0.0346	Reject
DI does not Granger cause Fxp	4.15338	0.0657	Accept
PPT does not Granger cause DI	6.83442	0.0173	Reject
DI does not Granger cause PPT	0.37756	0.5401	Accept
VAT does not Granger cause DI	0.24551	0.0626	Accept
DI does not Granger cause VAT	3.48211	0.0842	Accept
NOT does not Granger cause DI	4.15665	0.0545	Accept
DI does not Granger cause NOT	3.48662	0.0684	Accept

Source: Authors' computation

However, very important is the significance and positive nature of the immediate past value of diversification index in the result. This established the fact that one year lagged value of the index influenced its value in the succeeding year.

Table 3. The parsimonious model. Dependent variable: D(DI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.167296	0.215973	0.774617	0.4448
D(DI(-1))	0.57400	0.316275	-2.54623	0.0251
D(PPT)	0.21219	0.248286	-2.07896	0.0416
D(CXP(-1))	0.22563	0.211621	-2.53367	0.0307
D(FFR(-1))	0.33075	0.283333	-2.80409	0.0316
ECT(-1)	-0.82160	0.296047	-2.97254	0.0038
Adjusted R-squared	0.323028			
F-statistic	4.496396			0.029499
Durbin-Watson stat	2.280886			

Source: Author's computation

Specifically, the result portends that an average of 57 percentage point decrease in the index occurred due to a 100 per cent increase in the value of the index in the immediate past year. In the same vein, the immediate past year value of fiscal freedom, an institutional variable, positively influenced the level of diversification index in the contemporaneous year. Such that, a 100 per cent increase in the quality of fiscal freedom in a year brought about an average of 33 percentage points fall in the diversity index in the succeeding year. Also, the immediate past value of government capital expenditure has a significant inverse relationship with the index. It shows that as the one-year lagged value of capital spending increases by 100 per cent, the index moves up by an average of 20 percentage points. More importantly, petroleum profit tax impacts positively on the index, contemporaneously. Specifically in the same year, an average of 51 percentage point increase in the index is obtained from a 100 per cent increase in petroleum tax revenue.

Meanwhile, it is important to note that the results obtained from the analysis should be treated with caution when comparing with the results of earlier studies. This is due to the fact that economic conditions are different from country to country.

6. Conclusion and Policy Implications

  This paper has examined the efficacy of fiscal policy for diversification in Nigeria by analysing time series data covering the period 1981-2015. Specifically, using the OLS and ECM techniques, it evaluated the average impacts of tax revenues, government expenditure, real GDP, and index of fiscal freedom on export diversification in the country. Results from the analyses reveal a positive relationship between the index of diversification and each of petroleum profit tax, capital expenditure, and fiscal freedom over the sample period. In conclusion, therefore, fiscal policy, with respect to petroleum profit tax and capital expenditure, is an effective driver of export diversification in Nigeria.

  Policy-wise, the findings of the study as mentioned above bear some implications for the Nigerian economy. Firstly, increased proceeds from petroleum profit tax would help diversify the export base of the country. To achieve this, government needs to intensify its efforts at collecting actual amount due from the profit figures of relevant oil companies in the country. It is a common knowledge that revenue from tax is relatively stable and viable for economic development. As such, income from petroleum profit would avail the country more fund for diversifying its export mix.

  Secondly, diversification comes as a result of higher level of capital expenditure, providing that such spending is judiciously used. In this regard, government should enhance and encourage large production of manufacturing outputs for exports. Essentially, government needs to provide infrastructure like roads, railways, electricity, research and development, and others that can help reduce the cost of, as well as boost, production of exportable goods and services across all sectors. When production is enhanced aggregately in the non-oil sector, it would transform the country's export mix gradually from oil dominance to manufactured goods. Hence, a manufacturing-export-based diversification would propel sustainable development of the country.

  Finally, presence of good institutions eases the process of diversification. Institution is the rule and regulation of activities. Thus, government should strengthen, and make independent, the institutions that are responsible for the process of diversity. For example, when the Federal Inland Revenue

Service, as an institution, operates according to, and within the confines of, the rules and regulations guiding it, there would be efficiency, and economy, in petroleum profit tax administration and collection. This, in collaboration with the judicial institution, would strengthen the FIRS to go after, and prosecute, tax evading oil firms irrespective of their status.

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Appendices

Appendix I

Table A1: Result of the Johansen cointegration rank test (Trace)

Hyp. No.	Eigenvalue	Max-Eigen Stat	5% C.V.	Prob.
r = 0	0.514721	43.37751	26.04523	0.0047
r ≤ 1	0.375572	20.45687	14.28544	0.0043
r ≤ 2	0.216855	6.684723	1.864434	0.0256

Source: Authors' computation

Appendix II

Table A2: Result of the Johansen cointegration rank test (Maximum Eigen-value)

Hyp. No.	Eigenvalue	Max-Eigen Stat	5% C.V.	Prob.
r = 0	0.514721	19.43663	19.32302	0.0472
r ≤ 1	0.375572	12.11622	12.16627	0.0436
r ≤ 2	0.216855	6.684723	1.864434	0.0256

Source: Authors' computation

Appendix III

Table A3: Lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-475.5065	NA	735.5057	29.30343	29.66622	29.42549
1	-304.4781	248.7686*	1.254992	22.81686	26.08196*	23.91546*
2	-227.0190	75.11187	1.186711*	22.00115*	28.16858	24.07630

Source: Authors' computation

Appendix IV

Table A4: Wald test result

Test Statistic	Value	Df	Probability
F-statistic	15.32705	(7, 27)	0.0000
Chi-square	107.2894	7	0.0000

Source: Authors' computation

Appendix V

Table A5: Overparameterised Model. Dependent variable: D(DI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.12013	0.41575	-0.28895	0.7759
D(DI(-1))	0.62102	0.24843	2.24152	0.0433
D(VAT)	-0.67732	0.20125	-1.25624	0.0997
D(VAT(-1))	-0.37577	0.28042	-1.34000	0.1969
D(NOT)	-0.61446	0.34156	-1.79899	0.0888
D(NOT(-1))	-0.30854	0.33946	-0.90890	0.3754
D(PPT)	0.94486	1.08200	0.87326	0.3940
D(PPT(-1))	0.72050	1.09925	0.65545	0.5205
D(CXP)	-0.18117	0.17904	-1.01190	0.3250
D(CXP(-1))	-0.06261	0.15777	-0.39683	0.6962
D(FXP)	0.03162	0.04859	0.65073	0.5234
D(FXP(-1))	0.04685	0.05222	0.89715	0.3815
D(RGDP)	-0.13959	0.12362	-1.12922	0.2736
D(RGDP(-1))	-0.10750	0.14839	-2.32443	0.0431
D(FFR)	0.13032	0.22774	0.57227	0.5742
D(FFR(-1))	0.51407	0.23959	2.14564	0.0458
ECT(-1)	-0.87887	0.25990	-3.16247	0.0032
Adjusted R-squared	0.30575			
F-statistic	4.781403			0.046388
Durbin-Watson stat	1.643435			

Source: Authors' computation