

ECONOMIC DIVERSIFICATION: IMPERATIVE FOR TRADE AND INDUSTRIAL POLICIES IN NIGERIA

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DOI: 10.2478/tjeb-2018-0005

The sharp and continuous decline in crude oil prices since the mid-2014, along with the lackluster efforts at diversifying the sources of revenue and foreign exchange in the economy, incontrovertibly led to the recession that greeted Nigeria in the second quarter of 2016 as manifested by fiscal crisis. Hence this study examines the imperative of economic diversification in trade and industrial policies in Nigeria. In order to characterize the pattern of trade and industrial transformation in the diversification process, we adopted the augmented version of Kaldor's first law which establishes a link between manufacturing output and economic growth. Based on annualized secondary time series, spanning from 1970 to 2015, obtained from the CBN statistical bulletin of various years, the study employed the contemporary econometric techniques of cointegration and error correction mechanism, within the framework of the Autoregressive Distributed Lag (ARDL) model as proposed by Pesaran et al (2001) in achieving its objective. The results show that manufacturing output, crude petroleum and natural gas production, as well as mining production have significant positive longrun impact on economic growth in Nigeria. This implies that economic diversification-based industrial policies will definitely bring about the desired economic outcomes in Nigeria. We therefore conclude that trade and industrial policies should be geared towards diversification of the economy.

Keywords: Economic Diversification, Trade Policies, Industrial Policies, ARDL, Nigeria

JEL Classification: O14, O24, O25

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1. Introduction

Economic Diversification (ED) is the process of transforming an economy from a mono-product economy to multiple sources of income spread. However, mono-product economic status is essentially predisposed to the vagaries and vulnerabilities of the global market with attendant consequences for the growth and development of the national economy. Countries that have diversified their economy are likely better to accommodate the commodity price movement. Increased economic diversification improves the performance of the economy and minimizes external shocks, leading to sustainable development. The imperative for economic diversification in Nigeria emanates from the structural changes that characterized the Nigerian economy in the 1970s. Prior to this period, Nigeria was self-sufficient in food production and exports of major crops which accounted for over 70% of total exports. In fact in 1960, petroleum contributed 0.6% to GDP while agriculture's contribution stood at 67%. Nigeria continued to enjoy these accolades in agricultural production until the discovery of oil. However, the oil boom of the 1970s led Nigeria to neglect its strong agricultural and light manufacturing base in favour of an unhealthy dependence on crude oil. By 1974, the share of petroleum had increased to 45.5% almost doubling that of agriculture which had decreased to 23.4%, largely due to significant fall in the output of export products like cocoa, palm oil rubber and groundnuts, the share of agricultural products in total exports decreased to less than 2% in the 1990s and beginning from 2000, oil and gas exports accounted for more than 98 % of export earnings and about 83 % of federal government revenue (CBN, 2004).

However, Nigeria has the potential to become a major player in the global economy by virtue of its human and natural resource endowments but these potentials have remained relatively untapped over the years. After a shift from agriculture to crude oil and gas in the late 1960s, Nigeria's growth has continued to be driven by consumption and high oil prices. Previous economic policies left the country ill-prepared for the recent collapse of crude oil prices and production. The structure of the economy remains highly import dependent, consumption driven and undiversified with the manufacturing sector accounting for less than 1% of total exports. The high growth recorded during 2011- 2015, which averaged 4.8% per annum mainly driven by higher oil prices, was largely non-inclusive. Majority of Nigerians remain under the burden of poverty, inequality and unemployment. General economic performance was also seriously undermined by deplorable infrastructure, corruption and mismanagement of public finances. Decades of consumption and high oil price-driven growth led to an economy with a positive but jobless growth trajectory. After more than a decade of economic growth, the sharp and continuous decline in crude oil prices since mid-2014, along with a failure to diversify the sources of revenue and foreign exchange in the economy, led to a recession in the second quarter of 2016 as manifested by fiscal crisis, high rate of unemployment, high inflation rate foreign exchange shortage, balance of payments and debt crisis (EGRP, 2017). It is against this background, that this study examines economic diversification as imperative for trade and industrial policies in Nigeria. This paper has its own

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format. It is structured in six sections: section one presents current issues in Nigeria at the moment, section two presents some stylized fact about economic diversification in Nigeria, while section three reviews some relevant literature; section four outlines the research method, while section five presents the empirical results and discussion of findings and finally, section six brings the concluding remarks.

2. Stylized Facts on Economic Diversification in Nigeria

Conventional theory posits that as economies diversify, their income grows. In natural resource-based economies, diversification helps to dissipate the negative effects of terms of trade shocks. Within the context of Nigeria, as with many resource-producing countries, structural transformation is closely associated with economic diversification in the production structure and in how the state sources its fiscal revenues. In Nigeria, sustained economic growth over more than a decade, from 2003 to 2014 was driven by a global commodity super-cycle, rising demand for commodities by industrializing emerging powers (Taylor, 2014; World Bank, 2015). In Nigeria's GDP, there is evidence of diversification and transformation in the composition of economic activity and in sectoral drivers of growth. There is a shift towards services – Information and Communications Technology (ICT), Trade, Finance, Construction, Micro, Small and Medium Scale Enterprises (MSMEs). It is important to note that this 'diversification' is more evident in data covering the year 2010 onwards because GDP revisions from this period now capture 44 economic sectors rather than 33 sectors previously. Table 1, Presents the distribution of real by sector in Nigeria

Table 1: Percentage Distribution of Real GDP by Sector 1960 -2015

| Sectors | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 2000 | 2005 | 2010 | 2015 |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Primary Sector | 70.54 | 69.68 | 66.99 | 62.10 | 58.40 | 60.25 | 55.68 | 68.36 | 61.92 | 58.44 | 55.30 |
| Agriculture | 68.8 | 66.95 | 49.45 | 30.10 | 28.37 | 29.24 | 22.99 | 34.62 | 42.40 | 41.69 | 40.20 |
| Mining & Quarrying | 1.66 | 2.73 | 17.54 | 32.00 | 30.03 | 31.20 | 32.69 | 33.74 | 19.90 | 16.75 | 15.10 |
| Secondary Sector | 9.67 | 12.55 | 16.15 | 13.05 | 12.14 | 12.60 | 9.04 | 10.51 | 9.24 | 9.05 | 6.2 |
| Manufacturing | 4.73 | 7.00 | 7.66 | 6.30 | 5.60 | 5.95 | 5.12 | 4.32 | 4.03 | 3.72 | 4.2 |
| Building & Const. | 3.30 | 4.95 | 7.77 | 2.90 | 2.83 | 2.87 | 1.78 | 2.70 | 1.72 | 2.01 | 6.2 |
| Utilities | 1.63 | 0.60 | 0.67 | 3.85 | 3.71 | 3.78 | 2.14 | 3.49 | 3.49 | 3.32 | 3.0 |
| Tertiary Sector | 19.79 | 17.77 | 16.86 | 24.85 | 29.46 | 27.16 | 35.28 | 21.13 | 28.84 | 32.32 | 34.0 |
| Wholesale & Retail | 19.36 | 15.40 | 13.56 | 14.21 | 14.17 | 14.19 | 8.68 | 12.92 | 16.16 | 18.14 | 19.4 |
| Other Services | 0.43 | 2.37 | 3.29 | 14.64 | 15.29 | 14.97 | 26.60 | 8.21 | 12.68 | 14.37 | 15.4 |
| Total (GDP) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

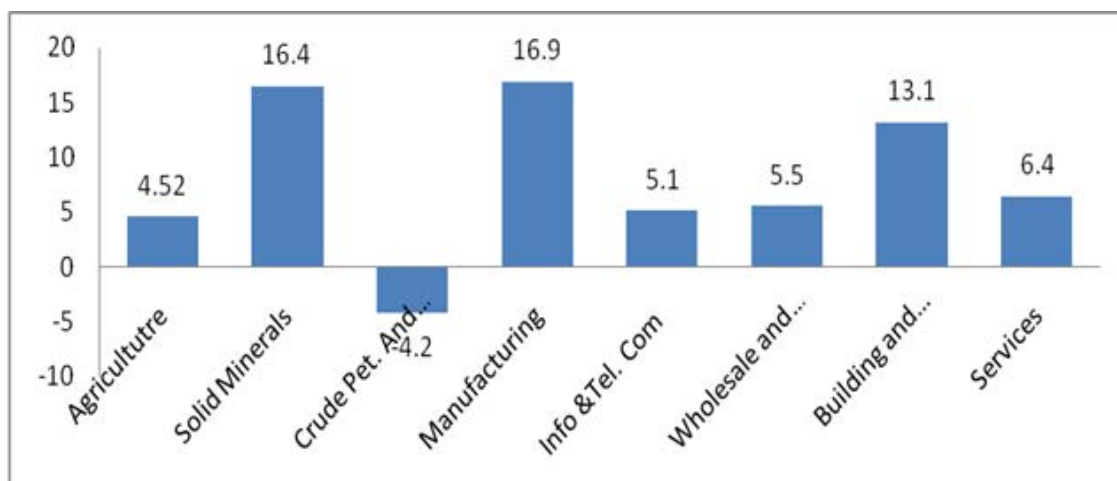
Source: National Bureau of Statistics (NBS) and International Financial Statistics (IFS) for various years

Agriculture continued to be a major contributor to GDP from 1960 to 2015. The distribution of Nigeria's GDP as illustrated in Table 1 above is dominated by the primary sector which comprises agriculture, mining and quarrying. Agriculture remains the main driver of the primary sector, while the secondary sector is the least contributor to the GDP in Nigeria. However, the deceleration growth in agriculture sector may be partly attributed to the

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paradigm shift to the oil sector with its ripple effects on the manufacturing, building and construction and wholesale and retail trade activities. Despite this challenge, the sector contributed about 40.2 percent to real GDP in the 2015 compared to the mining sector's contribution of 15.10 percent, while the manufacturing and the building and construction sector have been hovering around 4.2 percent and 6.2 percent respectively in 2015. However, the tertiary sector has also contributed significantly to the real GDP growth, contributing 39.0 percent in 2015. However, the contribution of the agriculture and the tertiary sectors need to be emphasized because these sectors offer real potentials for diversifying the economic base and yet have remained largely untapped. A major orientation of policy for government would be to develop a strategic approach for these sectors similar to that which helped unleash the potential of the telecom industry over a decade ago. Specific policy initiatives targeted at allowing private sector participation in the sector promise to further boost economic activities in these sectors and their contribution to inclusive growth through job and wealth creation. Figure 1 further indicates the average sectoral growth rate.



Source: Central Bank of Nigeria Statistics Database (2015)

Figure 1: Average Sectoral Growth Rate (%) 2011-2014

From the Figure 1 above, the average growth of manufacturing sector is recorded at 16.9% while solid minerals are 16.4 %, building and construction accounted for 13.1%. Agriculture on the other hand accounted for 4.52 %. However, the negative growth rate of -4.2% recorded in the oil and gas sector can be largely attributed to vandalism in the Niger Delta region. Also, the slow growth rate recorded in the agriculture sector can be attributed to the dwindling of the export potential of cash crops such as cocoa, groundnut, cashew among others, due to poor infrastructure and mismanagement of the Agricultural sector which before the 1970 oil boom formed 70% of Nigeria's export. Today, Nigeria is no longer a major exporter of cocoa, groundnut, rubber, and palm oil. The fact is that agriculture has suffered from years of

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neglect, poorly conceived government policies as well as lack of basic infrastructure such as power, roads, water supply, storage facilities so on. As a matter of fact, there is an urgent need for the Nigerian government to begin looking into diversification of the economy so as to attain solid and sustainable economic growth. It is assumed that greater diversification would reduce exposure to volatility and uncertainty in the global oil market, help create private sector jobs, increase productivity and sustainable growth, and establish the non-oil economy that will be needed in the future when oil revenues start to dwindle. Table 2 presents some selected macroeconomic performance in Nigeria for (1970-2015).

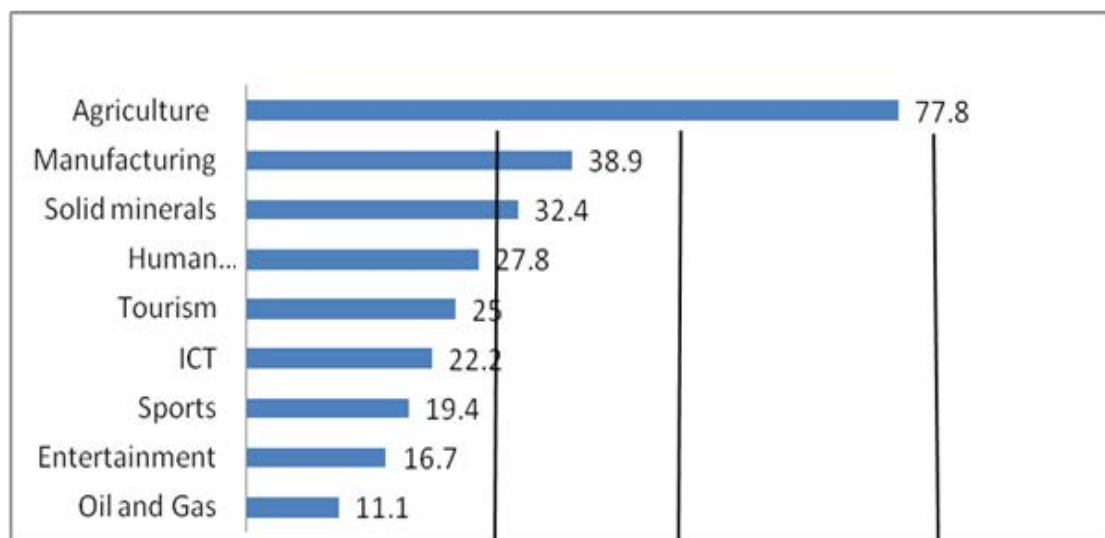
Table 2: Selected Indicators of Macroeconomic Performance in Nigeria (1970-2015)

| Year | GDP growth (%) | Oil Export as as (%) of GDP | Non Oil Export as as (%) of GDP | Import as a (%) of GDP | Inflation Rate (%) | Money supply (%) of GDP | Exchange rate (%) |
|-----------|----------------|-----------------------------|---------------------------------|------------------------|--------------------|-------------------------|-------------------|
| 1970-1975 | 2.5 | 9.7 | 7.1 | 14.3 | 13.8 | 0.32 | 0.53 |
| 1976-1980 | -5.2 | 21.2 | 1.7 | 17.3 | 33.9 | 0.29 | 0.61 |
| 1981-1985 | 4.2 | 27.5 | 1.1 | 18.3 | 10.2 | 0.25 | 0.66 |
| 1986-1990 | 8.7 | 16.5 | 0.7 | 10.4 | 5.5 | 0.22 | 3.77 |
| 1991-1995 | 6.2 | 39.9 | 1.2 | 17.1 | 7.4 | 0.27 | 15.83 |
| 1996-2000 | 2.5 | 47.9 | 1.2 | 39.1 | 12.4 | 0.17 | 36.04 |
| 2001-2005 | 3.8 | 41.9 | 0.5 | 21.5 | 6.9 | 0.23 | 119.57 |
| 2006-2010 | 5.2 | 63.3 | 0.7 | 18.6 | 11.6 | 0.26 | 130.81 |
| 2011-2015 | 7.2 | 43.8 | 1.1 | 17.4 | 13.3 | 0.24 | 146.03 |

Source: CBN Statistical Bulletin and Annual Report (various years)

The table above shows the underutilization of the non-oil export potentials which consistently lagged behind from 1970 to 2015. However, the over dependence on the oil export made the Nigeria economy to contract since the over 40% slump in oil prices, resulting in lower foreign revenue generation for the nation as oil and gas makes up about 85% of its commodity exports. At the same time inflation has been risen to double digits from a low of 7% in 2001- 2005 to the average of 17% in 2016. Consequently, import increase from 14.3 % in 1970-1975 to 17.4 % in 2011-2015. In fact, between 1970 and 2015, crude oil as a share of government revenues has fluctuated between 70% and 80% during that period, often higher than 70% and in some cases higher than 80%. Interestingly, the decline started in 2011 when the crude oil share of government revenues declined to 80.95% in 2011, to 75.88% in 2012, to 67.25% in 2013, and 67.12% in 2014. Figure 2 below depicts the ranking of the sectors in Nigeria according to their economic potential for diversification. The figure shows that agriculture is recommended by the majority of the respondents as the sector for priority attention. This is followed by the manufacturing and the solid minerals sector. Accordingly, human capital development, tourism and ICT were ranked next to manufacturing respectively in that order. Interestingly, oil and gas which has dominated the nation's GDP was ranked the least sector having the potential for diversification. These sectors in the medium-to-long term are key to boosting other sectors like manufacturing.

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Source: NISER Survey Data, 2013

Figure 2: Ranking of sectors having potential for diversification (%)

The ranking of agriculture as the sector having the highest potential for diversification could not be unconnected with the fact that Agriculture is made up of four sub-activities such as Crop Production, Livestock, Forestry and Fishing. For instance, Onwualu (2012) maintains that the value chain approach to agriculture has the potentials to open up the economy and generate various activities, which are capable of creating jobs and enhancing industrialization and thus makes the non-oil sub-sector to hold the access for future Nigeria's sustainable economic growth. Given the above it is clearly evident that the only way to resolve this age-long and decades of over reliance on oil is to intensify diversification of the economy away from oil and the consideration of other sectors of the economy endowed with vast potentials for revenue generation. In this vein, successive Nigerian governments on its part have shown efforts over the years to grow the non-oil export trade by establishing supportive policies. Some of these policies, with varying degrees of successes, include but not restricted to, protectionism policy in the mode of import substitution, policy of industrialization in the 1960s, trade liberalization policy (this took the form of Structural Adjustment Programme) of the mid 1980s and export promotion policy of 1990s, which was executed through intensified policy support to Small and Medium Scale Enterprises (SMEs), to enhance productivity and subsequently, export of local products (Onodugo, 2013).

2.1 An overview of the Nigerian Industrial Policies

In attempt to facilitate industrialization in Nigeria over the years, different industrial policies/industrialization strategies have been formulated and implemented. The Nigerian Government has displayed determination over the years to grow the non-oil sector of the

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economy by putting in place supportive policies and incentives. These policies have been targeted at encouraging the diversification of the economy. These are categorized into three namely: Protectionism policy, Trade liberalization policy and Export promotion policy. To evaluate the growth pattern of the non-oil sector, it is necessary to look at how the non-oil sector has performed under these policy regimes.

2.1.1 Protectionism Policy Era

This policy spanned between the early 1960s and late 1970s, it was characterized by the removal of agricultural export and sales taxes and by the increased tariffs on agricultural imports. Agricultural inputs, particularly fertilizers, were subsidized. The Pre - SAP era featured an era of import substitution industrialization. The policies under the era was aimed at expanding the industrialization-base, enhancement of cash crop exports, encouraging farmers to expand their farms and increase the production of cash crops with guaranteed external markets by the marketing boards, adjustment in the demands for foreign exchange, introduction of trade barriers. The ultimate goal was to protect domestic industries that were set up to produce import substitutes. However, protectionism ended in 1974 with the removal of restrictions on import. By the Third National Development Plan (1981 - 1985) trade policies were relaxed due to falling oil revenue and decline in foreign exchange.

2.1.2 Trade Liberalization Policy Era

Trade policies since 1986 have been aimed at liberalization of the economy as well as achievement of greater openness and greater integration with the world economy. The policies thus ranged from abolition of marketing boards, to introduction of the second tier foreign exchange market (SFEM), various export expansion incentive schemes, establishment of the Nigeria Export- Import Bank etc. Thus, in July, 1986, the Structural Adjustment Programme (SAP) was introduced to tackle the problem of imbalances in the economy and thereby pave way for stable growth and development. The Export Incentive and Miscellaneous Provisions Decree of 1986 were promulgated to encourage exports. As a result of the various policy supports, significant growth was experienced in the agricultural, telecommunication and business sectors (Analogbei, 2000).

2.1.3 Export Promotion Policy Era

This policy was aimed at encouraging the diversification of the export base of the Nigeria economy. One of the incentive policies in this regard was the Export Expansion Grant (EEG) Scheme, which operates under the legal context provided under the Export (Incentives and Miscellaneous Provisions) Act 1986. The export grant was given to exporters to cushion the impact of infrastructural disadvantages faced by Nigerian exporters and to make exports competitive in the international market. However, the Nigerian Export Promotion Council (NEPC) is responsible for the administration of the policy. Realizing the importance of the

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policy in promoting non-oil exports, government subjected the EEG policy to reform in 2006. The scheme was streamlined to make it more effective by categorizing export products according to their degree of value addition and processing and rewarding those companies which generate higher export growth and new investment in export capacity building (Adeloye, 2012)

2.1.4 Exports under African growth & opportunity Act (AGOA)

This act was passed by USA government to allow duty free access to products from sub-Saharan Africa. Consequently, Nigerian products such as cocoa beans, dried-split ginger, leather, woven sacks and technically specified rubber (TSR) are being exported to the USA. More so, in all these policies, boosting export earnings have become even more pertinent today in view of the weakening exchange rate of Naira and shrinking foreign exchange reserves. However, the current economic hardship faced in the Nigeria today, is a product of many years of inappropriate policies, fiscal leakages and inefficient spending. The Economic Recovery and Growth Plan (ERGP), which builds on the Strategic Implementation Plan (SIP) for the 2016 has been formulated to address the various dimensions of the current challenges. It is a four-year plan spanning from 2017 to 2020 and provides a road map of strategic policy actions and enablers required to revive the economy and place it on a path of sustainable growth and development. The ERGP focuses on three strategic objectives: restoring growth, investing in human capital, and building a competitive economy. Table 3 presents the macroeconomic and sectoral projections of the ERGP.

Table 3: Macroeconomic and Sectoral Projections, 2016-2020 (% of GDP)

| Sectors | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|--------|--------|--------|--------|--------|
| Real GDP Growth (%) | -1.54 | 2.19 | 4.80 | 4.50 | 7.00 |
| -of which Agriculture Growth (%) | 4.69 | 5.03 | 7.04 | 7.23 | 8.37 |
| -of which Manufacturing (%) | -10.13 | 7.74 | 6.11 | 6.07 | 8.02 |
| -of which Service (%) | -0.51 | -1.26 | 3.16 | 2.45 | 5.82 |
| Non Oil Export(%) | -0.07 | 0.20 | 4.83 | 4.52 | 7.28 |
| Oil Export (%) | -15.41 | 24.30 | 4.55 | 4.35 | 4.45 |
| Inflation rate (%) | 18.55 | 15.74 | 12.42 | 13.39 | 9.90 |
| Gross Domestic Investment (I) | 13.95 | 13.90 | 14.34 | 15.57 | 17.34 |
| -of which Government Investment (I _g) | 3.53 | 3.71 | 3.15 | 2.89 | 2.76 |
| -of which Private Investment (I _p) | 10.42 | 10.20 | 11.19 | 12.68 | 14.58 |
| Exports of goods and services (X) | 9.01 | 10.82 | 11.52 | 11.39 | 11.66 |
| -of which exports of goods | 8.38 | 10.23 | 10.95 | 10.85 | 11.13 |
| Imports of goods and services (M) | -12.58 | -12.03 | -11.40 | -10.58 | -10.47 |
| -of which imports of goods | -8.69 | -8.43 | -8.11 | -7.59 | -7.71 |
| Oil Price Benchmark (US\$) | 38.00 | 42.50 | 45.00 | 50.00 | 52.00 |
| Oil Production (mbpd) | 1.7 | 2.2 | 2.3 | 2.4 | 2.5 |

Source: Adopted from Nigeria's EGRP, 2017

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To restore growth, there is need firstly to stabilize the economy. In achieving this, Real GDP is projected to grow by 4.6% on average over the Plan period, from an estimated contraction of 1.54% recorded in 2016. Real GDP growth is projected to improve significantly to 2.19% in 2017, reaching 7% at the end of the Plan period in 2020 driven by strong non-oil sector growth anchored on agriculture and food security, energy, transportation and industrialization. In the same vein, the inflation rate is projected to trend downwards from the current level of almost 19% to single digits by 2020. It is also projected that the exchange rate will stabilize as the monetary, fiscal and trade policies are fully aligned. Crude oil output is forecast to rise from about 1.8 mbpd in 2016 to 2.2 mbpd in 2017 and 2.5 mbpd by 2020. Further, Agriculture is projected to be the driver of GDP growth, with an average growth rate of 6.9% over the Plan period. The Agricultural sector will boost growth by expanding crop production and the fisheries, livestock and forestry sub-sectors as well as developing the value chain. Thus, by 2020, Nigeria is projected to become a net exporter of key agricultural products.

2.2 Challenges of Economic Diversification in Nigeria

According to a recent study by the UN Economic Commission for Africa (UNECA, 2016), some of the successful African diversified countries include, Mauritius, Tunisia, Egypt, Botswana, Kenya and South Africa. However, the drivers of these successful diversification are: (i) quality/magnitude of investment in infrastructures and key sectors; (ii) effective trade and industrial policies; (iii) dynamic growth performance in productivity and output; (iv) macroeconomic stability anchored on sound fiscal/monetary policies and improvements in key economic fundamentals such as interest rates, exchange rate, inflation and access to affordable credit for SMEs and the real sector; and (v) institutional environment, such as good governance, enhanced national competitiveness, absence of conflict and an attractive environment for local business and international investors. However, Nigeria's diversification challenges go beyond its dependence on oil, but can be attributed to deeper institutional dynamics at play. Nigerian government has made some efforts in the diversification of the economy but policies in this area have not been effective due to a number of challenges which include: macroeconomic orientation, poor infrastructure, weak economic institutions, poor corporate governance, poor educational orientation, endemic corruption and insecurity.

3. Literature review

Hirshman (1981) identified three important diversification- related linkages in his study of Asian countries. These include (i) consumption linkages such as export earnings financed domestic consumption to stimulate economic activities in response to such demands.

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However, the consumption pattern may be skewed towards import. (ii) productive linkage: this is the most reliable for the purpose of economic diversification, in this approach, private agents are able to decide the viable linkages; 'alien' technology will discourage the involvement of the inside agents. (iii) fiscal linkage; the government will be able to raise revenue from the high-rent exports, but may not be good investor with the proceeds. Based on the finding that the productive linkage is the most reliable for the purpose of economic diversification, the author recommends encouraging private initiatives in productive linkage and ensuring the efficiency of public investments. The author further posited that the productive linkage approach was adopted in China in its economic diversification process with particular emphasis on crops such as the production of rice, wheat and maize.

Moghaddasi et al, (2017) examined the Export diversification and agricultural growth in developed countries using a panel data set of 20 developed countries during 2000–2014. The study used Herfindahl index for export diversity and GLS method to examine dynamic interactions among the variables. Main results showed that openness, export diversification, rainfall, capital stock, total factor productivity and EU membership had positive effect on agricultural growth while labor force was negatively related to it. The study recommended that governments should support entrepreneurship and provide all prerequisites to motivate investments in new kind of activities and products in agriculture. According to positive and significant effect of openness, more agricultural growth could be obtained by following more liberalized trade regimes.

Nouf et al, (2017) investigated the Economic diversification in resource rich countries: history, state of knowledge and research agenda. The study found strong negative correlation between oil dependency and diversification even after controlling for country specific unobserved heterogeneity such as geography, country specific trends such as culture and demographic factors, time varying global shocks, and cross-sectional dependence. A closer look at the residuals indicate that MENA and Sub-Saharan African countries have more room for policy maneuvers when it comes to diversification

In the same vein, Emerole and Edeoga (2013) carried out an empirical analysis of the problems and prospects of export marketing of non oil agricultural product in Nigeria. The work analyzed the performance of the non oil agricultural export of Nigeria, the prospect of the non oil agricultural exports on the economy of Nigeria, the effect of trade variables on non oil agricultural export of Nigeria and the analysis of the relationship between non oil export and economic growth. The study found that non oil agriculture export has the prospects of contributing to the economic growth of Nigeria and the unfavorable nature of the foreign exchange constituted a major problem. Based on the above, it is advised that non oil agricultural exports should be supported as this was found to have a positive relationship

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with the economy and the foreign exchange was found to be negatively affecting the non oil agricultural export and should be regulated effectively

Michler and Josephson (2016) examine the agriculture diversity and poverty dynamics in Ethiopia using household panel data and developing diversity index to measure the effect of crop diversity on poverty status. The results provide evidence that households which grow a diverse set of crops are less likely to be poor than households that specialize in their crop production. Additionally, crop diversity reduces the probability that a non-poor household will fall into poverty and the probability that a poor household will remain in poverty. The study conclude that crop diversification is a viable way to deal with the exigencies of being poor

Clark et al, (2016) investigate the relationship between manufacturing diversification and level of economic development for 29 African countries. Three diversification stages were identified. Considerable differences in diversification are found over the first stage at the low end of the per capita income scale. The study recommends that diversification alone will not encourage development in poorer countries until obstacles such as weak institutions, poor governance and lack of infrastructure are addressed. Results further shows that countries further along the African economic development path successfully diversified manufacturing. However, greater openness and resource intensity may encourage diversification. On the contrary, Ansu (2013) argued that Structural Adjustment Programs (SAPs) imposed by the IMF and World Bank may have limited manufacturing diversification by discouraging the use of targeted industrial policies to support specific activities.

Uzonwanne (2015) in her study, attempted to seek out how diversification of the economy will enhance stable and viable economic growth in Nigeria. The descriptive statistical method was employed for the study. The study like many others, found that there exists a positive relationship between economic growth in Nigeria and diversification of other sectors because, when there were proper management of human resources, huge investment and concentration on agriculture, Nigerian economy was recorded to be healthy and vibrant. Relying on the neo-classical growth model, the study called for the diversification of Nigerian economy with an urgent need to decentralizing concentration on mono-crude oil economy.

4. Research Method

4.1 Theoretical Framework and the Model

In order to characterize the pattern of trade and industrial transformation in the diversification process, we adopt the augmented version of Kaldor's first law which establishes a link between manufacturing output and economic growth. The law states that the growth of the GDP is positively related to the growth of manufacturing output not just

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because the manufacturing output is part of GDP but in a fundamental causal sense related to the production features of the manufacturing activities (Kaldor, 1967). In specifying Kaldor's law in the context of our study, some important variables thought to be the driving forces of growth of an economy (such as labour and capital) were adequately incorporated.

Having stated the foregoing and in line with the broad objective of this study, we specify our model as follows:

$$RGDP = f(INDUSTRY, TRADE, Z) \quad (1)$$

Where *INDUSTRY* includes the manufacturing output; crude petroleum and natural gas and mining (solid minerals), *TRADE* consists of export and import of goods and services and *Z* is a vector of other variables thought to be determinants of growth (e.g. labour and capital). In line with above, our empirical model is specified in its extended form, in log-linear transformation as follows:

$$LN RGDP = \beta_0 + \beta_1 LNMAO + \beta_2 LNOIL + \beta_3 LNMIN + \beta_4 LNTOP + \beta_5 LNLAB + \beta_6 LNCAP + \mu \quad (2)$$

Where LN RGDP = natural logarithm of real gross domestic product; LNMAO = natural logarithm of manufacturing output; LNOIL = natural logarithm of crude petroleum and natural gas production; LNMIN = natural logarithm of mining production; LNTOP = natural logarithm of the degree of trade openness; LNLAB = natural logarithm of labour force and LNCAP = natural logarithm of capital. Also μ is the stochastic error term; β_0 is the intercept parameter; whereas β_1 to β_5 are the partial coefficients of the explanatory variables of the model. Note that manufacturing output, crude petroleum and natural gas and mining production are the variables that make up the Nigeria's industry while trade openness provides information relating to how external transactions affect the domestic economy.

A Priori Specification: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ & $\beta_6 > 0$.

4.2 Estimation Technique

The study utilizes the Ordinary Least Squares (OLS) technique on a Single -Equation Multiple Regression Model (SEMRM). The choice of OLS technique is necessitated by the fact that it has proven to be the best linearly unbiased estimator (BLUE), among the class of other estimators. The OLS technique is also unique and preferred to other techniques because it provides consistent estimates of the parameters of economic relationship with smallest possible standard errors. However, applying OLS directly to our model without accounting for

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the time series properties of the relevant variables may result in spurious regression. In order to overcome the impending problem of spurious regression, we subjected the relevant time series to certain pre-test analyses such as the unit root test. The test for unit root was carried out to find out whether the chosen time series are stationary or not and if not, appropriate measures be applied to ensure that the relevant time series are stationary. There are many approaches used in testing time series for stationarity, prominent among them are the Augmented Dickey-Fuller (ADF) and Philip-Perron (PP) unit root tests which are adequately utilized in this study.

Following the stationarity test, cointegration test was carried out to find out if there is a longrun relationship between variables. Given that the need to avoid spurious regression had forced economic researchers to rely on differenced stationarity time series and the consequent loss of important longrun information, cointegration is carried out to find out if a linear combination of non-stationary time series converges to equilibrium or not. The implication of cointegration is that any intermittent deviation is seen as being temporary as equilibrium holds in the longrun. There are many approaches to cointegration test and the most commonly used approaches are the Engle-Granger residual-based test and the Johansen reduced-rank test. However, the EG and Johansen's approaches have been criticized on the ground that they have poor small sample power; they require that all variables be integrated at the same order and did not account for the possibilities of endogeneity bias within the system. In order to avoid the problems associated with the standard cointegration tests (EG and Johansen tests), we employed the Pesaran et al (2001) Autoregressive Distributed Lag (ARDL) Bound Testing approach to cointegration. This approach adequately accounted for the aforementioned problems with the standard cointegration tests and has been used extensively in many empirical researches. The ARDL test is based on estimating the following unconstrained ECM in its generic fashion:

$$\begin{aligned} \Delta LNRGDP_t = & \alpha + \sum \beta_i \Delta LNRGDP_{t-i} + \sum \delta_j \Delta LNMAO_{t-j} + \sum \lambda_k \Delta LNOIL_{t-k} + \sum \phi_l \Delta LNMIN_{t-l} + \sum \gamma_m \Delta LNTOP_{t-m} \\ & + \sum \theta_n \Delta LNLAB_{t-n} + \sum \pi_p \Delta LNCAP_{t-p} + \delta_1 LNRGDP_{t-1} + \delta_2 LNMAO_{t-1} + \delta_3 LNOIL_{t-1} + \delta_4 LNMIN_{t-1} + \\ & \delta_5 LNTOP_{t-1} + \delta_6 LNLAB_{t-1} + \delta_7 LNCAP_{t-1} + \varepsilon \end{aligned} \quad (3)$$

Equation (3) above is an unconstrained ECM version of the Pesaran et al (2001) ARDL specification. The bound cointegration test is based on F-test whose asymptotic distribution is non-standard under the null of no cointegration. We begin by applying OLS on equation (3) and test for cointegration by conducting F-test for the joint significance of the lagged level of variables. Thus, the null of no cointegration against the alternative is stated as follows:

H₀: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0$, against H₁: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq 0$

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Two sets of critical values are reported in Pesaran et al (2001) under the assumption that the relevant variables are either I(0) or I(1). We reject the null when the F-test is greater than the upper bound or we accept the null when the F-test is less than the lower bound but our decision is inconclusive when the F-test falls within the upper and lower bounds (Pesaran et al, 2001).

Consequent upon rejection of the null hypothesis of non-cointegration as well as establishing the longrun relationship between the relevant variables, an error correction model is applied to reconcile the longrun behavior of the variables with their shortrun responses within the framework of ARDL model. Finally, stability test of the coefficients is carried out using the cumulative sum (CUSUM) test provided by Brown et al (1975).

5. Empirical Results and Discussion of Findings

We begin this section with presenting as well as discussing the results of ADF and PP unit root tests on annualized secondary time series data. Although unit root test is not compulsory when ARDL bound cointegration approach is used, but the need to test for unit root is to ensure that none of the variables is I(2) as ARDL bound test makes no meaning in the face of I(2) variables (Nwogwugwu, Maduka & Madichie, 2015). Thus, ADF and PP unit root tests have been carried out on levels and differences of the relevant time series. The results show a high degree of consensus between ADF and PP tests in identifying the order of integration of LNREGDP, LNMAO, LNOIL, LNTOP, LNLAB and LNCAP which are I(1), I(1), I(0), I(0), I(0) and I(1) respectively. Surprisingly, the result is rather inconclusive about the exact order of integration of LNMIN given that ADF and PP results are mixed (i.e. ADF reported LNMIN to be I(2) whereas PP shows that it is I(1)). However, given that ADF test has poor small sample power than the PP test and that ADF could be biased in the face of structural break, we therefore rely on the PP result to conclude that LNMIN is actually I(1) variable. The results of the unit root tests are reported in Table 4 below.

Table 4: ADF and PP Unit Root Test Results

| Variable | ADF | | Order of Integration | PP | | Order of Integration |
|----------|-------------|-------------|----------------------|-------------|-------------|----------------------|
| | Level | Differenced | | Level | Differenced | |
| LNREGDP | -2.455807 | -6.184804** | I(1) | -2.455807 | -6.184804** | I(1) |
| LNMAO | -2.765937 | -5.481788** | I(1) | -2.718318 | -5.481788** | I(1) |
| LNOIL | -3.351853* | ----- | I(0) | -3.551278* | ----- | I(0) |
| LNMIN | -0.529453 | -5.476204** | I(2) | -2.858627 | -5.237819** | I(1) |
| LNTOP | -0.276715 | -6.593920** | I(1) | -0.276715 | -6.593920** | I(1) |
| LNLAB | -4.320242** | ----- | I(0) | -5.057497** | ----- | I(0) |
| LNCAP | -0.871994 | -12.34703** | I(1) | -1.429191 | -12.34703** | I(1) |

NB: ** and * imply significant at 1% and 5% levels of significance respectively.

Lag length is based on SIC automatic selection.

Source: Authors' computation using EViews 10

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Having confirmed that the variables of our model are fractionally integrated, (i.e. filled with both I(0) and I(1)), we safely proceed to the ARDL bound cointegration test. The results of ARDL bound test are reported in Table 5. The bound test results show evidence of a longrun relationship between real gross domestic product and the chosen explanatory variables, given that the value of F-test is 10.00957, which is greater than the 4.43 upper bound critical value at the 1% level of significance. We therefore reject the null of no cointegration between LNRGDP and other variables in our model. The implication of this finding is that any deviation from equilibrium is regarded as temporary as equilibrium holds in the longrun.

Table 5: ARDL Bound Cointegration Test Result

| F-Bounds Test | | Null Hypothesis: No levels relationship | | |
|----------------|------------|---|-----------------------|------|
| Test Statistic | Value | Signif. | I(0) | I(1) |
| | | | Asymptotic: n=1000 | |
| F-statistic | 10.00957** | 10% | 2.12 | 3.23 |
| K | 6 | 5% | 2.45 | 3.61 |
| | | 2.5% | 2.75 | 3.99 |
| | | 1% | 3.15 | 4.43 |

NB: ** implies significant at 1% level of significance.

Source: Authors' computation using EVIEWS 10

Upon rejection of the null of no cointegration between real gross domestic product and the chosen explanatory variables, we report in Table 6 the level equation coefficients that represent the longrun impact of the explanatory variables (i.e. manufacturing output, crude petroleum and natural gas, mining production, trade openness, labour and capital) on the dependent variable (LNRGDP). The result of the level equation shows that all variables except trade openness (LNTOP) have the expected positive sign. That is, manufacturing output (LNMAO), crude petroleum and natural gas (LNOIL), mining (LNMIN), labour (LNLAB) and capital (LNCAP) have positive impact on the real gross domestic product (LNRGDP) which proxies for economic growth. However, only capital (LNCAP) is found to be statistically insignificant at any level. This implies that capital is not a strong determinant of growth in Nigeria and as such, any policy action taken on stock of capital may not have any impact on the economy. The significant negative sign shown by trade openness could be attributed to the fact that the Nigerian external trade is heavily dominated by export of primary products (e.g. crude oil export) and import of secondary products. Thus, the more the economy opens up to trade, the more the economy experiences stunted growth. The manufacturing output seems to be the most viable driver of growth after labour, judging from the value of its coefficient, which is positive and greater than that of crude petroleum and natural gas (LNOIL) and is also

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statistically significant at 1% level, implying that any policy action targeted on the manufacturing output will definitely affect economic growth in Nigeria. The coefficient of crude petroleum and natural gas (LNOIL) is positive and statistically significant at 1% level, meaning that a percentage increase in crude petroleum and natural gas production will result in about 0.21 percent increase in economic growth rate in Nigeria and that any policy action directed on crude petroleum and gas production will definitely affect economic growth in Nigeria. The mining production (LNMIN), which is a sub-sector of the Nigerian industry sector appears to be the least contributor to growth among other sub-sectors in the industry sector, judging from its coefficient and is statistically significant, meaning that policy target on mining could bring about changes in the level of growth of the economy.

Table 6: Estimated Longrun Coefficients

| Dependent Var: LNRGDP | | | | |
|---|-------------|------------|-------------|--------|
| Levels Equation | | | | |
| Case 3: Unrestricted Constant and No Trend | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LNMAO | 0.540774** | 0.086165 | 6.275999 | 0.0000 |
| LNOIL | 0.214994** | 0.038717 | 5.552933 | 0.0000 |
| LNMIN | 0.110487** | 0.026390 | 4.186717 | 0.0002 |
| LNTOP | -0.066805* | 0.025844 | -2.584909 | 0.0147 |
| LNLAB | 1.619002** | 0.383443 | 4.222276 | 0.0002 |
| LNCAP | 0.033760 | 0.022530 | 1.498435 | 0.1441 |
| EC = LNRGDP - (0.5408*LNMAO + 0.2150*LNOIL + 0.1105*LNMIN -0.0668 | | | | |
| *LNTOP + 1.6190*LNLAB + 0.0338*LNCAP) | | | | |

NB: **(*) implies significant at 1%(5%) level of significance.

Source: Authors' computation using EVIEWS 10

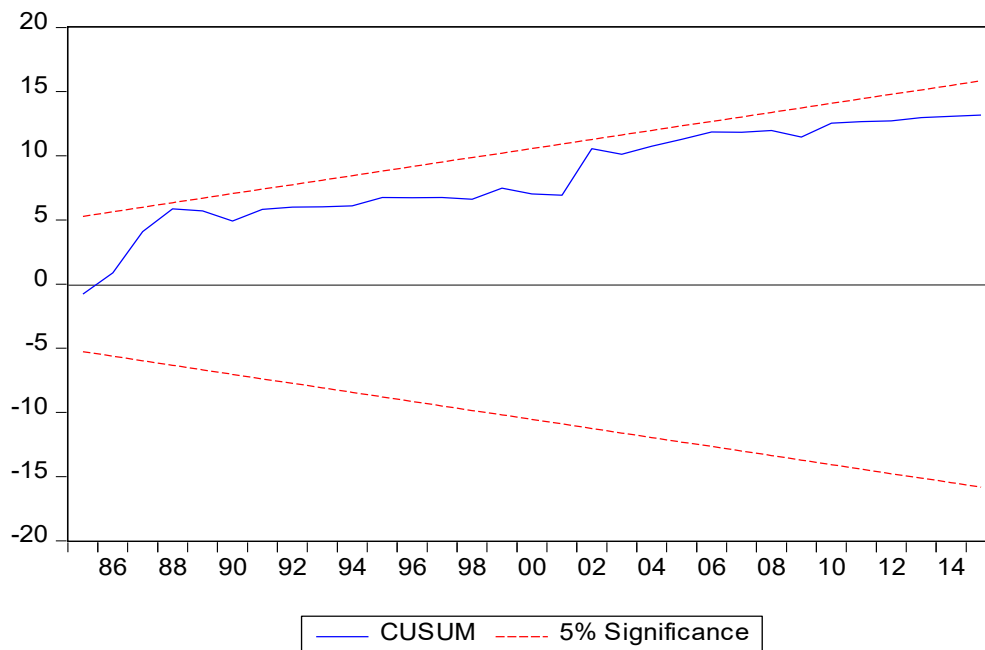
It is widely known that if a stable longrun relationship exists among variables, an error correction model is estimated in order to reconcile the longrun behaviour of variables with their shortrun responses. The ARDL-based error correction model consists of the differenced form of the relevant variables (including the lagged differenced of the dependent variable), plus the lagged value of the residual from the level equation. This is to ensure consistent estimates of both longrun and shortrun coefficients of the model. The result of the ARDL-based ECM is reported in Table 7. The major concern is to report as well as discuss the value of the error correction term, which serves as the adjustment parameter. The result shows that there is a strong feedback effect of deviation of the real gross domestic product (LNRGDP) from its longrun growth path. This is because the error correction term (CointEq(-1)) has the expected negative sign and is statistically significant at the 1% level. The value -0.7332, of the coefficient of the error correction term shows that about 73.32 percent of the deviation of real GDP from equilibrium is corrected in each period (annually).

MADICHIE, C. V., OSAGU, F., EZE, E.A, (2018).*Economic diversification: imperative for trade and industrial policies in Nigeria***Table 7: Parsimonious ARDL-Based ECM for Shortrun Dynamics**

| ECM Regression | | | | |
|--|-------------|-----------------------|-------------|-----------|
| Case 3: Unrestricted Constant and No Trend | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -19.33301 | 2.147458 | -9.002741 | 0.0000 |
| D(LNMAO) | 0.225455 | 0.043785 | 5.149151 | 0.0000 |
| D(LNOIL) | 0.509012 | 0.031129 | 16.35182 | 0.0000 |
| D(LNOIL(-1)) | 0.054222 | 0.013888 | 3.904393 | 0.0005 |
| D(LNLAB) | 76.87283 | 12.42483 | 6.187033 | 0.0000 |
| D(LNLAB(-1)) | -77.11159 | 11.73248 | -6.572491 | 0.0000 |
| CointEq(-1)* | -0.733248 | 0.080182 | -9.144855 | 0.0000 |
| R-squared | 0.989136 | Mean dependent var | | 0.123220 |
| Adjusted R-squared | 0.987375 | S.D. dependent var | | 0.324046 |
| S.E. of regression | 0.036411 | Akaike info criterion | | -3.643009 |
| Sum squared resid | 0.049052 | Schwarz criterion | | -3.359161 |
| Log likelihood | 87.14620 | Hannan-Quinn criter. | | -3.537744 |
| F-statistic | 561.4791 | Durbin-Watson stat | | 2.580812 |
| Prob(F-statistic) | 0.000000 | | | |

Source: Authors' computation using EVIEWS 10

Furthermore, post-estimation diagnostic tests were performed to ensure that our model does not suffer any econometric problems such as serial correlation, heteroskedasticity, non-normality, specification error as well as non-stability problems. Thus, we used the Breusch-Godfrey serial correlation LM test for serial correlation diagnoses, Breusch-Pagan-Godfrey Heteroskedasticity test for heteroskedasticity diagnoses, Jaque-Bera test for normality, Ramsey-RESET test for specification error diagnoses and cumulative sum (CUSUM) for stability test. The results of the aforementioned post-estimation diagnostic tests show evidence that our model is robust and does not suffer any econometric problems. The CUSUM stability test shows that our estimated coefficients are stable since the fitted line falls within the upper and lower bound at 5% level.

MADICHIE, C. V., OSAGU, F., EZE, E.A, (2018).*Economic diversification: imperative for trade and industrial policies in Nigeria***Figure 3: Stability Test**

Conclusion

The study examined the imperative of economic diversification in trade and industrial policies in Nigeria. Based on the theoretical and empirical underpinnings, the study identifies manufacturing output, crude petroleum and natural gas production and mining production as the industry sub-sector variables and trade openness (measured as the ratio of export plus import to current GDP) as trade variable, while taking cognizance of other determinants of growth (labour and capital). Using annualized secondary time series obtained from the CBN statistical bulletin of various years, the study specified real gross domestic product as a function of the aforementioned industry and trade variables as well as labour and capital, based on the theoretical framework of Kaldor's first law, which links manufacturing output and growth of the economy. The contemporary econometric techniques of cointegration and error correction model, within the framework of the Pesaran et al (2001) ARDL model was adequately utilized in this study. The results of the study show that manufacturing output, crude petroleum and natural gas production and mining production have significant positive longrun impact on economic growth in Nigeria. This implies that industry-based economic diversification policies will definitely bring about the desired outcomes in Nigeria. The study further reveals that trade openness has significant negative longrun impact on economic growth in Nigeria as against the theoretical expectation of the study. This outcome is attributable to the fact that the Nigerian external sector is heavily dominated by the export of

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primary products (crude oil export) and import of secondary products (food items and refined petroleum products). We therefore conclude that trade and industrial policies should be geared towards diversification of the economy.

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