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Diversification of the economy, tax revenue and sustainable growth in Nigeria

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Abstract

Economic diversification is a panacea for ensuring sustainable growth in developing countries. Studies have associated the problem of sustainable growth with the inability to broaden tax nets. The lack of economic diversification and the inadequate optimal utilization of tax revenue have deepened infrastructural deficits and slowed Nigeria's sustainable growth. However, the extent to which diversification affects sustainable growth in Nigeria remains uncertain. Consequently, this study empirically examined the effect of economic diversification on Nigeria's long-term growth. *The ex-post facto* research approach was adopted using time series data sourced from the Central Bank of Nigeria's statistical bulletin. The study covered 30 years from 1990 to 2020. Descriptive and inferential statistical tools were used in analyzing the data after carrying out unit root tests for stationarity to avoid obtaining invalid and unauthentic regression estimates. The study found that the GDP growth rate exhibited a positive and significant effect on sustainable growth, ($AdjR^2$ = 0.581, $F_{(6, 23)}$ = 3.4299; *p-value* = 0.035). Furthermore, the study revealed that infrastructural expenditure had a positive but insignificant effect on sustainable growth ($AdjR^2$ = 0.870; $F_{(6, 23)}$ = 0.037; *p-value* = 0.421). The study concluded that diversification had a positive effect on sustainable growth in Nigeria. Based on the results, the study recommended that Nigeria should maximize its resources and diversify the economy and ensure optimal utilization of tax revenue towards sustainable growth in Nigeria.

Keywords: Consumer price index, Diversification, GDP growth rate, Infrastructural investments, Inflation rate, Sustainable growth, Tax revenue.

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1. Introduction

Sustainable growth of an economy requires gradual and systematic strategic planning by the government and this has never been an easy task. Sustainable growth means the efficient creation of effective enabling economic drivers and the

sincerity of governmental efforts that will stimulate economic activities, national real output, increases in aggregate demand that will equally trigger fixed capital formation and all-inclusive economic growth over time [1]. The government is expected to make sufficient capital formation investments and economic infrastructure investments to increase national output and human potential [2]. According to Nkuda [3], national economic growth through the implementation of tax revenue would require a proper understanding of the volume and extent of available national economic resources and management of the same within the environment for sustainable human wellbeing. According to Oyeranmi [4], sustainable growth is the continuous enhancement of economic activities and human life for the present and future. Sustainable growth in Nigeria is problematic and multidimensional reflecting the overwhelming complexity of the problems and challenges that have long been identified and adequate and relevant prescriptive possible solutions have been recommended to address them. Incidentally, the deplorable infrastructure has remained unchanged in Nigeria and this is quite worrying and disturbing [5].

Sustainable growth has been designed to ensure macroeconomic indexes and all economic policies are working towards a meaningful harmony and enhancement of both the present and future economic potentials in meeting the human needs and aspirations of Nigerians to attain sustainable growth [6-8]. For economic diversification to impact sustainable growth, it requires the process of shifting the nation's economy away from one single source of income to multiple streams of income by growing all the sectors and market activities in the country. Diversification of the economy remains difficult for developing economies and may be even more difficult for countries with very low incomes, thus diversification of the economy beyond the mono-economy is inextricably connected with structural transformation of the economies to achieve higher productive results from the movement of economic resources beyond the internal to external means.

Studies have shown that achieving sustainable growth and diversification of Nigerian economy has been quite challenging, despite the Nigerian government's efforts in the past to embark on significant policy priorities to stimulate lower and middle-income economic activities, especially the informal sector of the economy. For instance, according to Ugoani [9], economic diversification is significant for sustainable growth and it has been tremendously significant for resilience. Unfortunately, the Nigerian economy has consistently failed to experience the anticipated economic development and these facts weaken the foundation of the Nigerian economic transformation and pace of progress Oki, et al. [10]. Okuwa and Campbell [11] reported that diversification of the economy had a propensity to increase all-inclusive growth, enhance economic stability and at the same time reduce inequalities and unemployment. Aguguom [12] posited that economic diversification has a direct relationship with economic growth and economic sustainability. This has continually made the Nigerian economy vulnerable to expected variability in the oil price, the uncertainties resulting in a revenue slump and the sudden external shocks in the Nigerian mainstream of income [13]. Promoting diversification of the economy is similar to weaving a beautiful Nigerian traditional fabric, reaffirming the more complexity, resilience and challenging to attain sustainable growth but diversification is extremely significant for resilience [14].

According to Egbulonu and Duru [15], Nigeria has shown remarkable economic growth and commendable socio-economic progress in the last two decades, however, economic diversification would have laid a more concrete and formidable foundation for faster accelerated economic growth which contradicts studies claiming that are not well diversified experience a decline in growth, accompanied by weak sectors and institutions. This is consistent with the views expressed by Nkuda [3] who stressed that the economies of nations tend to be weakened when there is a lack and insufficient diversification, susceptibility to uncertainties or any global crisis like a pandemic. Given the importance of economic diversification, the Nigerian government must recognize various dimensions of diversification and their economic implications for various economic policy options [16].

Economic diversification necessitates a systematic structural transformation of the entire sector of the economy from lower to higher economic productive segments [17]. Studies in recent literature have advanced the idea that diversification of the economy relies on three basic perspectives and dimensions: The perspective of expanding economic sectors that eventually enhances employment and production that has an on impact Gross Domestic Product (GDP) diversification, second, the perspective of international trade or exports diversifications and finally the implementation of tax revenue concerning fiscal diversification perspective [4].

This study is focusing more on the diversification of the economy and its impacts on sustainable growth concerning the implementation of tax revenue which involves spreading out, intensifying, and increasing multiple tax revenue sources and strategic government expenditure targets [5]. Previous studies in Nigeria had not given adequate attention to research on sustainable growth considering optimization of tax revenue-creating gaps in the literature. In extending the frontiers and contributing to knowledge, this study fills this gap by considering diversification of the economy, optimization of tax revenue, and sustainable growth in Nigeria. The government fiscal policy in terms of tax revenue plays a central role in helping to crystalize broader economic transformation through the expansion of economic activities in selected sectors and industries that impact enhances sustainable growth [9].

In the current Nigerian economic situation, sustainable growth has suffered distorted economic growth and huge casualties as a result of diverse problems ranging from inconsistencies in successive governments to variability of economic policies that had adversely impacted sustainable growth in Nigeria [8, 17]. Studies have shown that inadequate investment in infrastructure and a lack of political willpower to make drastic investments that will promote sustainable growth from the three perspectives of economic, social, and natural growth have negated and dwarfed sustainable growth [18]. In addition, there had been evidence of misappropriation of the common treasury as a result of high corruption cases involving past and present serving public office holders, reported fraud cases and diversion of funds that should have been invested in enhancing sustainable growth in Nigeria and all these have culminated to extreme poverty, rapid population growth rate explosion, rapid urbanization due long-aged neglect of the rural development [6, 19].

Ugoani [9] opined that sustainable growth from the perspective of implementation of tax revenue has been devastating, orchestrated with a lack of optimal utilization of huge tax revenues that have accrued to African nations. Sub-Sahara Africa accounts for only a meagre 2% of global economic activities notwithstanding that the region occupies 14% of the global population. Most worrying is the fact that as the population of the region is projected to reach about 2 billion by the year, the same projected strong possibility of the African poverty level growing at an accelerated level. The World Bank projected that Africa could have 90% of the world's extreme poverty by 2030, citing the recent COVID-19 pandemic having a devastating impact on the sustainable growth in Nigeria and the rest of African countries [3, 7].According to the World Bank report, over 39 million Africans will be living in extreme poverty by the second quarter of 2021.

In the recent two decades, there has been a vast literature that has considered a diversification of the economy but that cannot be said of the effect of diversification on sustainable growth from the perspective of the implementation of tax revenue. Among the fewer studies, inconsistencies and divergent opinions have prevailed in the previous studies [7, 20-22]. While some studies have reported that diversification of the economy has a positive effect on sustainable growth [7, 20, 21]. Another study has found contradictory results, asserting that diversification of the economy had a negative and inverse effect on sustainable growth in Nigeria [22]. Consequently, due to the growing inconclusiveness and mixed results, this study proposed research objectives and hypothesized as follows:

1.1. Objectives

i. *Evaluate the effect of tax revenue and diversification of the economy on the GDP growth rate in Nigeria.*
ii. *Investigated the impact of tax revenue and diversification on infrastructural investments in Nigeria.*

1.2. Hypotheses

Ho1: Economic diversification and tax revenue have no significant effect on the GDP growth rate in Nigeria.

Ho2: There is no significant effect of tax revenue and diversification of the economy on infrastructural investments in Nigeria.

The rest of the study was structured in this manner: Section 2 considered the literature and theoretical review. In section 3, the methodology was considered, while data analysis, results, and a discussion of the findings were presented. The study ended with a conclusion, recommendations and suggestions for future studies in section 5.

2. Literature/Theoretical Review

2.1. Conceptual Review

This section of the study considered some of the concepts of diversification of the economy and sustainable growth and their proponents, explaining the understanding of prior studies and from the perspective of the researchers.

Sustainable Growth: Consistent with the underlying economic realities of sustainable growth in Nigeria including the high and extreme poverty level in Nigeria, low economic growth, a high unemployment rate, crime and intimidating kidnapping syndicates, an unabated crime rate and other depravities and terrifying grim narratives, Nigerians present that sustainable growth requires the urgency of building a strong, resilient and diverse economy to ensure that Nigerians fulfill their potential shared prosperity. Aditya and Acharyya [23] posited that there are sustainability growth desirability problems due to unchecked deforestation, environmental and green problems resulting from extractive industries, climatic variability, and natural environmental hazards [19]. Besides, Nigeria's sustainable growth problems have increasingly remained unresolved due to the lack of transparency and accountability of the leaders saddled with the responsibility of piloting the affairs of the Nigerian sustainable growth project, high corrupt political impunities heightened political pressures and weak institutions [10].

Furthermore, Oyeranmi [4] asserted that the challenges of sustainable growth include poverty and exclusion , prolonged high unemployment rate, climate change, conflicts in successive governments that fail to stick to specific long-term projects inherited by successors due to political ideology disparity in the hands of unpatriotic leaders in Nigeria Nkuda [3]. Nkuda [3] further posited that the situation in Nigeria is tending toward a failed state and that the Nigerian political leaders are now confused and cannot control the intimidating challenges Nigeria is faced with.

2.1.1. Economic Diversification

Economic diversification reflects the pragmatic and concerted efforts of the government in initiating the process of broadening the multiple economic streams of activities to ensure sustainable economic production and distribution of goods and services in a given economy [20]. It involves the creation of new avenues for meaningful economic growth and the application of economic strategies to boost multiple avenues for all sectors of the economy. In addition, a process to ensure multiple sources of income is rather dependent on oil revenue but also on all other economic activities that stimulate private and corporate business operations to increase taxable income and profits [7]. Diversification of the economy does not entirely depend on an increase in output but helps in the stabilization of the economy by enhancing economic diversification of the national sources of income rather than a mono-economy of depending on crude oil that is gradually getting exhausted but diversifying into agriculture, and mineral resources, increasing industrialization capacities and expanding the formal and informal sectors' taxation [5]. In addition, economic diversification is significant to consider beyond the crude oil prices and their effects on the Nigerian economy. In most cases, the Nigerian appropriation bill is benchmarked on crude oil prices, undermining the possible consequences of global and unstable oil prices in the international markets.

This will strengthen the capacity building in strategic economic diversification to ensure the long-term stability of the Nigerian economy and considered from this perspective, it can deeply support the Nigerian economy's adaptive ability and safeguards its long-term prospects in the face of possible depletion of crude oil and other natural deposits and over crude oil revenues but some others tax revenues and its optimal implementation of tax revenue in Nigeria. Ogbonna [24] noted that diversification of the economy is essentially potent and has the economic propensity to tackle anti-sustainable growth radical agents toward meeting economic broadmindedness and stimulate the economy toward job creation, infrastructural development and great business opportunities that will impact a broad spectrum of formal and informal businesspeople [17]. Economic diversification will trigger economic expansion of environmental capacity to meet stakeholders' needs by improving technologies, social, economic and environmental activities, improving environmental protection, securing afforestation, natural and mineral deposits from exploitation and extinction now in in the future [15, 18].

Agbaeze, et al. [19] posited that economic diversification could result in two basic strategic economic actions: Trade diversification of the economy by the nation embarking on aggressive and meaningful exporting of its products and services or embarking on new comparative advantages of new markets and by domestic productive diversification of intensified cross-sectional economic rebalancing of output, active and strategic reallocation of productive resources at is disposals across industries within and between companies increasing total factor productivity [6].

2.1.2. Gross Domestic Product Growth Rate

The gross domestic product which reflects the annual growth rate of the monetary value of all financial goods and services produced within the Nigeria territorial location is small and slow in comparison to every year is little and especially slow in comparison to the potential and great opportunities available to the nation, thus economic diversification is required to increase the growth rate. Oyelami and Alege [20] posited that Nigeria is the largest black nation in the world with a population of 212,389,018 people as of September 2021. This represents 2.64% of the world's population and ranks 7th in the world and has a land area of 9,10,770 km^2 with 52% of the population living in urban areas and 48% in rural areas. Oyelami and Alege [20] stated that the service sector is the largest contributor to the Nigerian gross domestic product which contributes 50% of total sectors consisting primarily of information and communication units with a 10% contribution. Though agriculture contributes 24% of GDP the contribution of mining, quarrying and other sectors to GDP could be improved if the government could open up the economy and consider liberalization and diversification of the economy pragmatically with a strong and sincere purpose.

2.1.3. Infrastructural Investments

Economic diversification requires consistent and meaningful infrastructural development and an effective economic incentive that will drive diversification of the economy. The expansion of industries and manufacturing companies largely depends on effective institutions and strong infrastructure that will open up the economy, provided foreign direct investment, create employment opportunities, enhance the development of the informal sectors and provide a steady power supply that will enhance the diversification of the economy beyond total dependence on the crude oil revenue [8, 9]. When there is massive investment in infrastructural provision, the construction of good road networks, railway systems, and uninterrupted power supply, these are essentially needed to widen the scope of revenue streams for private and corporate organizations and in turn, increase the revenue base of the economy.

2.1.4. Agricultural Exports

Nigerian massive landmass has remained underdeveloped and the nation's fertile farmland and agricultural activities remain untapped. In addition, the country has historically relied on crude oil. Agricultural products are capable to sustain the economy if there is a concerted effort to consider diversification into agricultural produce as another means of export for the country. In Nigeria, the agricultural sector is subdivided into four broad sectors: (i) crop production (ii) fishing (iii) livestock and (iv) forestry. Nkuda [3] posited that crop production seems to be the largest subsector and currently contributes about 88 per cent (%) of the total agricultural output in Nigeria. Next to crop production is livestock with 8.1 per cent (%), fishing at 3.2 per cent (5) and forestry at 1.1 per cent (%). Studies have shown that agriculture is capable of contributing far beyond its current 24% contribution to Nigeria's gross domestic product over the last seven years 2013-2019.

Consistent, with the position of Nkuda [3], the agriculture sector is the largest employer of labour with more than 36per cent (%) of the total employment of the Nigerian labour force. The country can intensify its diversification of the economy by harnessing agricultural investment opportunities and creating the legal framework and regulatory policy guidelines to enhance access to international markets for interested agricultural investors. Ensure efficient incentives opportunities and market information are available through a national agricultural information system network increasing the chances of having a specialized export market to improve export capacity [7].

2.1.5. Mining and Quarrying

The Nigerian mining and quarrying subsector are grossly underdeveloped and this has led to importing some minerals like salt and iron ore that should have been domestically produced in Nigeria. Solid minerals and quarrying have the potential to contribute significantly to the sustainable growth of the Nigerian economy. These sub-sectors are viable and have the capability of contributing to the revenue fund of Nigeria. It is another avenue to expand the economic diversification toward sustainable growth. Hence, the government can do more in its diversification drive by exploring these opportunities in solid minerals and quarrying expansion. These include crude oil, talc, iron ore, lead and zinc,

bentonite and barite, gold and bitumen, rock salt, gypsum, gemstones and coal among others [25]. According to the Nigerian Extractive Industries Transparency Initiatives (NEITI), the current contribution of this sector to the Nigerian gross domestic product is far below expectations. The sector contributes only a meagre 7% to the Nigerian GDP while mining contributes only 1% to the GDP. The activities of the illegal miners and extractors are another source of revenue leakage that the government needs to block by all means rather than open up the sector to legal operations that could attract foreign direct investors when an enabling platform is created. Akighir and Ateata [26] posited that the sector can generate more revenue for the economy than its capacity and the government need to reconsider designing and implementing more legal policies to encourage investors into the sector.

2.1.6. Foreign Exchange Rate

The foreign exchange rate refers to the rate of exchange between two or more countries in buying and selling transactions. The foreign exchange market is a market for buying and selling foreign currencies that provides an avenue for buyers and sellers to interact and negotiate a mutually acceptable price for settling transactions. Hence currencies dominate the major means of exchange for international transactions [27, 28]. The return of multinationals is greatly influenced that prevailing macroeconomic indexes. These include the variables identified to measure foreign exchange rates such as the inflation rate, interest rate, foreign exchange reserves, imports and exports of a country. The foreign exchange market poses a very high risk hence investors and nations that deal in foreign exchange have perfect information about the market but could create a strategy to outguess the market.

2.2. Theoretical Review

Institutional Theory of Sustainable Growth: The institutional theory of sustainable growth was brought to the literature domain by Meyer and Rowan [29]. In accounting and finance, the institutional theory of sustainable growth has been employed in the social context of the institutionalization process surrounding extraction and drilling processes in corporations like oil and gas companies and the environment where they operate. Many scholars had considered the institutional theory of sustainable growth from a different perspective: used as an entrenchment strategy by managers [30, 31]. The institutional environment has a significant impact on the development and maintenance of formal structures within companies' existence. Badeeb and Lean [30] also opined that innovative structures that improve technical efficiency in early-adopting companies are legitimized in the environment.

Relevance of the institutional theory of sustainable growth to this study: The theory is considered relevant to corporate sustainability because institutional pressure is more important than strategic analysis of stakeholders when multinational oil and gas companies tend to implement corporate sustainability and corporate social responsibility practices where they operate. Caselli, et al. [1] employed the institutional theory of sustainable growth to conceptualize how socially responsible practices vary across different countries. Dhir and Dhir [32] studied the impact of organizational visibility on corporate social performance. Durodola [33] and Mbasua [34] stated that indications abound for the "pollution haven" hypothesis showing that in some cases, international oil companies abandon their socially irresponsible practices to some of their foreign subsidiaries.

2.3. Empirical Review

Nwagba [25] studied the impact of the diversification of the Nigerian economy on economic development from the perspective of tourism. The study employed a survey research design using a questionnaire administered to a total of 290 respondents. The source data was analyzed using the Pearson Moments Correlation Coefficient analysis estimator and the study found that diversification through tourism had a positive and significant relationship with the economic development of Nigeria. The study also revealed that tourism development is significantly vital to the diversification possibilities of the Nigerian economy considering the revenue inflows from the tourism business.

Adeniyi [22] examined the job absorption capacity of Nigeria's mining and quarrying sector using an *ex-post facto* research design technique, considering the effect of mining and quarrying on employment capacity in Nigerian gross domestic product. The study used time series data sourced from the Central Bank of Nigeria for a period of 34 years covering 1981 to 2014. Vector Error Correlation Moment (VECM) was employed in carrying out the regression analysis. The result revealed that the mining and quarrying sector had a negative effect on employment absorption capacity in Nigeria. Owan, et al. [7] studied the effect of diversification on economic growth in Nigeria and the study covered a period of 36 years from 1981 to 2016. The study employed ex-post facto using secondary data, as gross domestic product was used as a measure of economic growth, non-oil diversification, non-oil exports and investment and the exchange rate from 1981 to 2016 constitute the parameters for the study. Using the ordinary least square method, the study carried out a regression analysis and found that non-oil GDP had a positive and significant effect on economic growth in Nigeria. In addition, the study revealed that exports and other investments had a positive but insignificant effect on economic growth in Nigeria. Oyelami and Alege [20] examined the impact of trade diversification on the macroeconomic performance of Nigeria. The study employed an ex-post facto research design using a bound test of the Autoregressive distributed lag (ADRL) correlation technique, using key macroeconomic variables. The study calculated both the short and long-run effects of Nigeria's economic growth from intensive and extensive trade diversification. The result of the analysis revealed that trade diversification had a positive relationship with economic growth. In addition, the study revealed that trade diversification had a positive effect on economic growth and was capable of sustaining economic growth.

Okuwa and Campbell [11] studied the effect of economic diversification on the economic performance of Nigeria to enhance sustainable economic growth. The study adopted a qualitative research approach highlighting diversification

options available to the Nigerian economy. The study suggested that rebasing the Nigerian GDP made Nigeria the 26th largest economy in the world. Hence all possible diversification options should be followed. Suberu, et al. [35] studied the effect of Nigeria's diversification on economic sustainability. The study adopted a qualitative research approach and employed descriptive statistics considering various diversification avenues in agriculture as the main value chain to be diversified by the Nigerian economic team. The total dependence on the mono-economy using oil revenue as the main source of revenue should be discarded by expanding the horizon and extending investment in other sources. Esu and Udonwa [21] studied the effect of economic diversification on economic growth in Nigeria. The study adopted an ex-post facto research approach using data obtained from the Central Bank of Nigeria Statistical Bulletin covering a period of 32 years from 1980 to 2011. The study considered an error correlation modelling framework while carrying out the analysis. According to the regression analysis, economic diversification had a positive relationship with economic growth in Nigeria. This suggests that diversification requires government consciousness and honest efforts in opening multiple revenue sources and making an investment that will stimulate economic growth.

Oyewo and Badejo [36] investigated the sustainability development reporting practices of Nigerian banks. All the listed commercial banks comprised the population of the study of which 12 were sampled. The criteria for the selected banks were premised on the bank's ability to have a separate report on sustainability reporting for the2012 reporting accounting period. The study concluded that the banks had struggled with sustainable development and that size and profit reports had no effect on the sustainability development reporting of the institutions under investigation during the time period.

3. Methodology

In this study, an *ex-post-facto* research approach was adopted using time series data sourced from the Central Bank of Nigeria's (CBN) statistical bulletin. Based on data availability, especially, CPI, the population sample size of the selected variables is 31 covering the period from 1990-to 2020. Descriptive and inferential statistical tools were used in analyzing the data after carrying out unit root tests for stationarity to avoid obtaining invalid or spurious regression estimates. Gross Domestic Product Growth rate (GDPGR) and infrastructural investments (INFRINS) were used to calculate sustainable growth while oil export, non-oil export, agricultural output (AGRY), and output of Mining and Quarrying (MINQ) were used to calculate economic diversification. Exchange Rate (EXR) and Inflation Rate-consumer price index (CPI) are also controlled for as independent variables.

3.1. Model Specifications

The specified models for this study are generally represented as follow:

$$Y_t = \alpha_0 + \beta_1 X_t + \mu_t$$

$$GDPGR_t = \alpha_0 + \beta_1 OILEXPT_t + \beta_2 NONOILEXPT_t + \beta_3 AGRY_t + \beta_4 MINQ_t + \beta_5 EXR_t + \beta_6 ICPI_t + \mu_t \quad (1)$$

$$INFEXP_t = \alpha_0 + \beta_1 OILEXPT_t + \beta_2 NONOILEXPT_t + \beta_3 AGRY_t + \beta_4 MINQ_t + \beta_5 EXR_t + \beta_6 ICPI_t + \mu_t \quad (2)$$

Where

GDPGR = GDP growth rate; INFEXP = Infrastructural expenditure; OILEXPT = Oil export

NON-OILEXPT = Non-oil export; AGRY = Agricultural output; MINQ = Mining and quarrying

EXR = Exchange rate; CPI = Consumer price index (Inflation rate)

Concerning the expected theoretical effects of diversification on sustainable economic growth, it is expected that an increase in the values of all the independent variables except the exchange rate and the inflation rate will spur sustainable growth. Thus, β_1 *to* $\beta_4 > 0$, while β_5 and $\beta_6 < 0$.

4. Results, Interpretations and Discussion of Findings

The empirical analyses carried out in this study start with pre-estimations regarding summary statistics, a correlation matrix to determine the possibility of multicollinearity of the selected time series, the trends of the variables and the unit root test to ascertain the level of stationarity of the variables in subsection 4.1 while subsection 4.2 hosts the empirical estimation done after testing for the nature of the order of integration of the series.

4. 1. Pre-Estimation

4.1.1. Descriptive Statistics

From the results in Table 1, it is evident that the average mean value of the GDP growth rate was 4.68% while federal government expenditure on infrastructure for the sampled period was 670 billion Naira. The total average output from the agricultural sector exceeded that of the mining and quarrying industrial subsector by 3545.04 million. Similarly, the average oil export of Nigeria was greater than that of the non-oil subsector. While the average annual exchange rate of the naira to the US dollar was 151.3/US$1, the inflation rate for the period was 113.3%.

It is also significant to note that the level of deviations (changes) in the variables, especially oil and non-oil exports exceed other variables. This reflects perceived level of inconsistency and volatility in oil prices that make the economic climate of Nigeria which is known for oil dependence and unstable. The growth rate of GDP exhibited the lowest level of deviation of about 3.8% followed by CPI at 87.9%. The total number of population samples (observations) was 31 and while all the variables were normally distributed as shown by the probability values of Jarque-Bera statistics, the non-oil export exhibited a non-normal distribution.

Table 1.
Descriptive statistics.

Variables	GDPGR (%)	INFEXP (₦ billion)	AGRY (₦ billion)	MINQ (₦ billions)	OILEXPT (₦ million)	NON_OILEXPT (₦ million)	EXR (₦ /US $)	CPI (%)
Mean	4.68	670.035	10989.77	7444.73	8010278	629161.9	151.3115	113.2523
Median	4.96	541.22	11301.92	7218.01	8086821.00	349761.40	132.83	80.69
Maximum	15.33	1872.59	18348.18	9323.75	20475872.00	3788036.00	358.81	329.98
Minimum	-1.79	19.74	3977.38	5759.82	717786.50	19492.90	21.89	23.69
Std. Dev.	3.78	585.85	4969.89	1098.06	6013212.00	833625.30	90.81	87.94
Jarque-Bera	1.90	2.07	2.08	1.56	1.54	60.69	1.87	4.58
Probability	0.39	0.35	0.35	0.46	0.46	0.00	0.39	0.10
Observations	31	31	31	31	31	31	31	31

Note: GDPGR = GDP growth rate; INFEXP = Infrastructural expenditure; OILEXPT = Oil export, NON-OILEXPT = Non-oil export; AGRY = Agricultural output; MINQ = Mining and quarrying, EXR = Exchange rate; CPI = Consumer price index (Inflation rate).

4.1.2. The Correlation Matrix Test of the Variables

Table 2 indicated that the GDP growth rate is negatively correlated with all series except mining and quarry subsectoral output. This is a simple indication of the fact that the trajectory of selected variables from different sectors may not have contributed significantly to sustainable growth in Nigeria.

The place of infrastructural investment as an indicator of the sustainability cannot be overlooked because it portrayed high values of the correlation coefficient with all the variables excluding mining and quarry subsector output. It should be noted that government infrastructural expenditures includes annual expenditure on-roads and the provision of the socio-economic and community services. Thus, improved investment in infrastructure will enhance the sustainable welfare of the masses. Overall, oil and non-oil exports had above-average positive correlation coefficients with other variables.

Table 2.
Correlation matrix of the variables.

Variables	GDPGR	INFEXP	AGRY	MINQ	OILEXPT	NON_OILEXPT	EXR	CPI
GDPGR	1							
INFEXP	-0.32	1						
AGRY	-0.22	0.94	1					
MINQ	0.68	-0.38	-0.24	1				
OILEXPT	-0.19	0.90	0.90	-0.16	1			
NON_OILEXPT	-0.32	0.88	0.76	-0.41	0.83	1		
EXR	-0.32	0.89	0.89	-0.38	0.79	0.78	1	
CPI	-0.48	0.95	0.91	-0.52	0.83	0.86	0.94	1

Note: GDPGR = GDP growth rate; INFEXP = Infrastructural expenditure; OILEXPT = Oil export, NON-OILEXPT = Non-oil export; AGRY = Agricultural output; MINQ = Mining and quarrying, EXR = Exchange rate; CPI = Consumer price index (Inflation rate).

4.1.3. The Trends of the Variables

Regarding diversification, Nigeria is long known for its monoculture economy that relies purely on the proceeds from oil exports. Agricultural and other non-oil subsectors were known as the mainstay of the economy before being independent. However, because of its lack of sustainability, even the resources from the oil sector have made the country known as a net-oil exporter because a large proportion of refined oil is still imported to Nigeria. The trends in Figure 1 show the trajectory of oil and non-oil exports in Nigeria for the sample period.

It can be seen that there is a wide gap between oil and non-oil exports. It is imperative to know as shown in Figure 1 that oil exports declined sharply in 2009, 2015-2016 and 2020. These periods correspond to the era of global financial crises, commodity shocks that spilled into recession in Nigeria and the outbreaks of COVID-19 respectively. Non-oil exports are also affected by COVID-19 as the trend slipped downward as well.

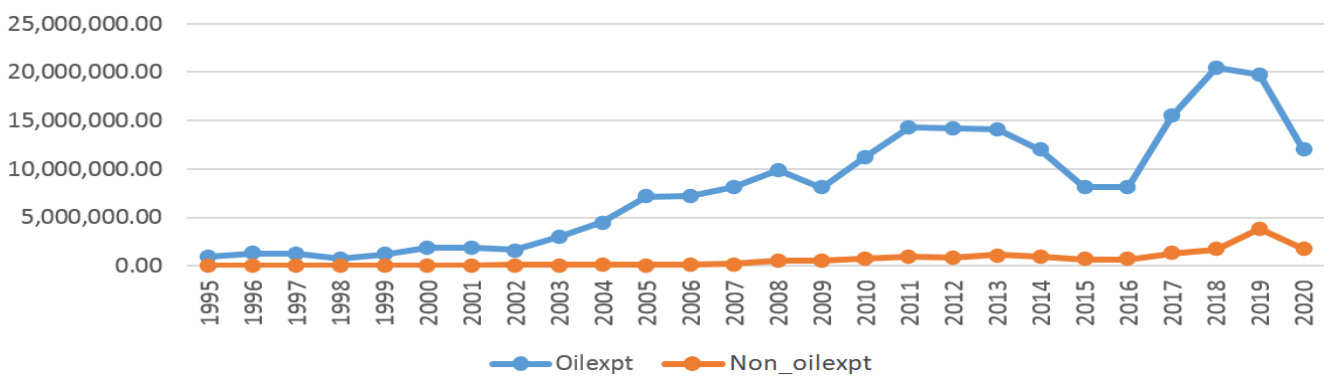

Figure 1.
Annual trends of oil and non-oil exports of Nigeria in millions (1995-2020).

To diversify the economy, the agricultural, mining and quarry sectors are very important because they will create employment for the teeming population of Nigerians and also enhance income. However, the mining and quarrying subsectors of the Nigerian industrial sectors like the agricultural sectors have been neglected. This negligence may have significantly contributed to the low level of output in these sectors. In Figure 2, mining and quarry output were initially greater than that of agricultural output between 1995 and 2001. From 2006 until 2020, agricultural sector productivity outpaced mining and quarrying. It is therefore, important that intensive economic diversification be directed towards these sectors.

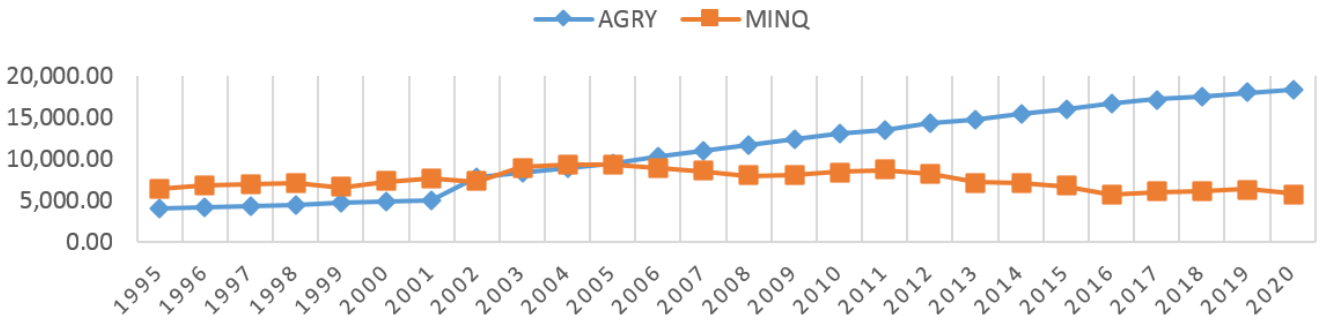

Figure 2.
Trends of Agricultural and mining and quarry output in Nigeria in billions of naira (1995-2020).

Furthermore, it is important to visualize the trends of the GDP growth rate and infrastructural expenditure as measures of sustainable growth. It is observed in Figure 3 that the growth rate of real gross domestic product (a measure of economic growth) exhibits an undulating or unstable shape. Right from 1996, the growth rate of the economy of Nigeria declined consistently from 4.2% to 0.58% in 1999 at the outset of the democratic dispensation. However, it improved significantly to 5.02% in 2000 and skyrocketed to 15.3% in 2002 at its highest peak ever. This high trend was unsustainable as it slipped down to 4.28% in 2012 with a negative growth rate during the 2016 recession (-1.62%) and the 2020 COVID-19 era (-1.79%).

It is noticeable that the periods of declining economic growth rate were characterized by increasing on infrastructure as shown in Figure 2. Surprisingly, while the economy grew at 2.21% and -1.79% in 2019 and 2020 respectively, infrastructural expenditure correspondingly slowed from 1,872.6 billion Naira to 1,848.8 billion Naira in 2019 and 2020. Public debts accumulated during this period could account for such growth in infrastructure while the economy is dragging.

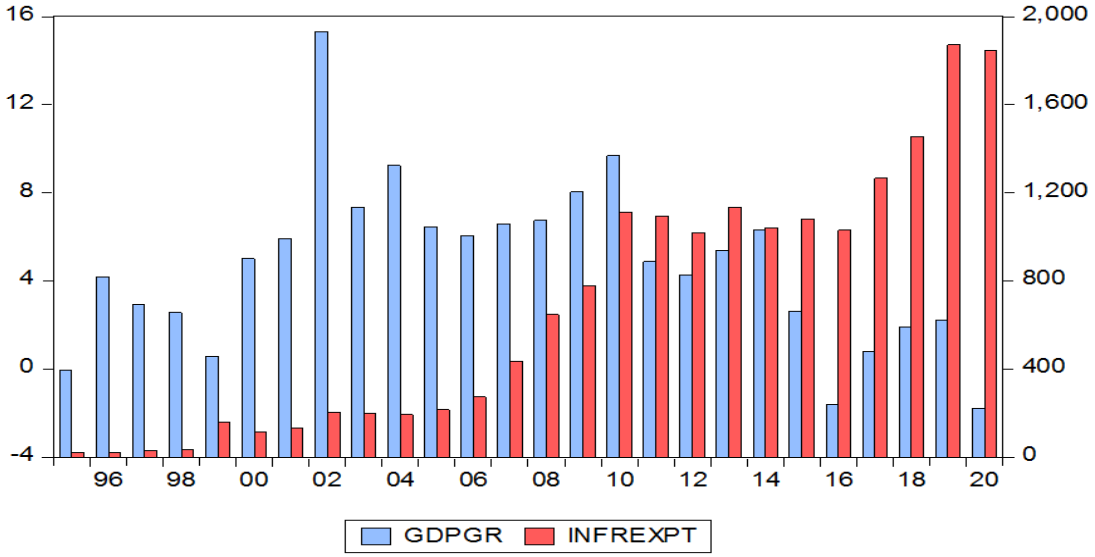

Figure 3.
Trends of the growth rate of GDP (%) and expenditure on Infrastructures (billions of naira) in Nigeria (1995-2020).

4.1.4. The Unit Root Tests of the Variables

The test for unit root helps determine the order of integration of the variables used in time-series studies. This is the stationarity test that reveals whether the variables are integrated at levels or first differences to avoid running spurious regression estimates that could lead to an invalid inference. According to Table 3, all the variables are integrated in order one [I (1)]. This permits the adoption of Fully Modified Ordinary Least Square (FMOLS) as the estimation method in this study.

Table 3.
Unit root test results.

Variables	Fuller			Philips-Perron		
	T-statistics	P-value	Remark	T-statistics	P-value	Remark
GDPGR	-6.839	0.000*	I (1)	-8.703	0.000*	I (1)
INFEXP	-5.732	0.000*	I (1)	-4.388	0.010*	I (1)
OILEXPT	-5.407	0.001*	I (0)	-1.758	0.075***	I (1)
NON-OILEXPT	-3.559	0.055***	I (0)	-3.375	0.080***	I (1)
AGRY	-20.116	0.000*	I (1)	-4.733	0.005*	I (1)
MINQ	-4.794	0.004**	I (1)	-4.793	0.004*	I (1)
EXR	-3.564	0.055***	I (1)	-3.564	0.055***	I (1)
CPI	-6.336	0.000*	I (1)	-5.673	0.001*	I (1)

Note: GDPGR = GDP growth rate; INFEXP = Infrastructural expenditure; OILEXPT = Oil export, NON-OILEXPT = Non-oil export; AGRY = Agricultural output; MINQ = Mining and quarrying, EXR = Exchange rate; CPI = Consumer price index (Inflation rate)
*, **, and *** represent 1%, 5%, and 10% level of statistical significance.

Table 4.
Regression result for model 1.

Dependent variable: GDPGR				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
GDPGR(-1)	-0.171	0.215	-0.793	0.440
Log_AGRY	39.703	11.738	3.382	0.004*
Log_MINQ	33.334	18.346	1.817	0.088***
Log_OILEXPT	-8.176	4.568	-1.790	0.092***
Log_NONOILEXPT	8.189	2.810	2.914	0.010*
EXR	0.033	0.014	2.300	0.035**
Log_CPI	-38.870	11.093	-3.504	0.003*
C	-201.326	58.496	-3.442	0.003*
R^2 = 0.709	Adj.R^2 = 0.581	F-test of long run variance = 3.4299 (0.035)**		

Note: *, **, and *** represent 1%, 5%, and 10% levels of statistical significance.

4.2. Main Estimation

All the variables are stationary at the first difference. The FMLOS analytical procedure was used to obtain empirical results in order to test the null hypotheses is the FMOLS. Hansen [37] earlier emphasized the strength of this method, especially in the presence of outliers. The results of the models with their respective hypotheses addressed are interpreted.

4.3. Test of Hypothesis One – Model One

The model is hereby reinstated as the results of the analysis.

$$GDPGR_t = \alpha_0 + \beta_1 AGRY_t + \beta_2 MINQ_t + \beta_3 OILEXPT_t + \beta_4 NONOILEXPT_t + \beta_5 EXR_t + \beta_6 ICPI_t + \mu_t$$

$$GDPGR_t = -201.326 + 39.703 AGRY_t + 33.334 MINQ_t - 8.176 OILEXPT_t + 8.189 NONOILEXPT_t + 0.033 EXR_t - 38.870 ICPI_t + \mu_t$$

To address the objective and provide answers to test the validity of the hypothesis, the result in Table 4 shows that economic diversification has a significant effect on the GDP growth rate in Nigeria for the sample period. This is supported by the overall F-stat. of the long-run variance of the model which is significant at 5%, *F-test: 3.4299; P-value: (0.035).*

With each of the measures of diversification used as independent variables, the results in Table 4 further show that a 1% increase in agricultural, mining and quarry outputs will sustainably increase the economic growth rate by 39.7%, and 33.3% respectively. The result peculiarly displays that while an increase of 1% in the quantum of oil export also increases the economic growth rate by 8.189%, the same level of increase in non-oil exports volume would stimulate the economic growth rate by 8.189%. However, the 1% effect will lead to a decrease of 8.176%, and 38.870% in the non-oil export and consumer price indexes respectively. This shows that non-oil export may have been better than oil export demanding increased diversification from oil.

Contrary to expectations, the e exchange rate is significantly higher than expected. It is expected that an increase in the exchange rate (which implies a depreciation of the Naira relative to the dollar) will worsen the rate of economic growth. However, the result shows that a 1% increase in the exchange rate would cause an increase in the GDP growth rate of 0.033%. Lastly, inflation is expected to have an impact on the GDP growth rate of 38.87%.

The adjusted R^2 result revealed that by implication based on the result of the adjusted R^2 (0.581), the included independent variables in the model determined the level of total variations in the growth rate of GDP by 58.1%.

4.4. Residual Diagnostic Check for Model One

The purpose of the diagnostic check for the estimated model one is to ascertain the stability and normality of the residuals of the estimated coefficients. Here, the Jarque-Bera plot in Figure 4 reveals through the probability value that the estimated residual is normally distributed. Null hypothesis of Jarque-Bera is the residual estimates are normally distributed. When the P-value is greater than 5% (P- value 0.4385), the null hypothesis is accepted.

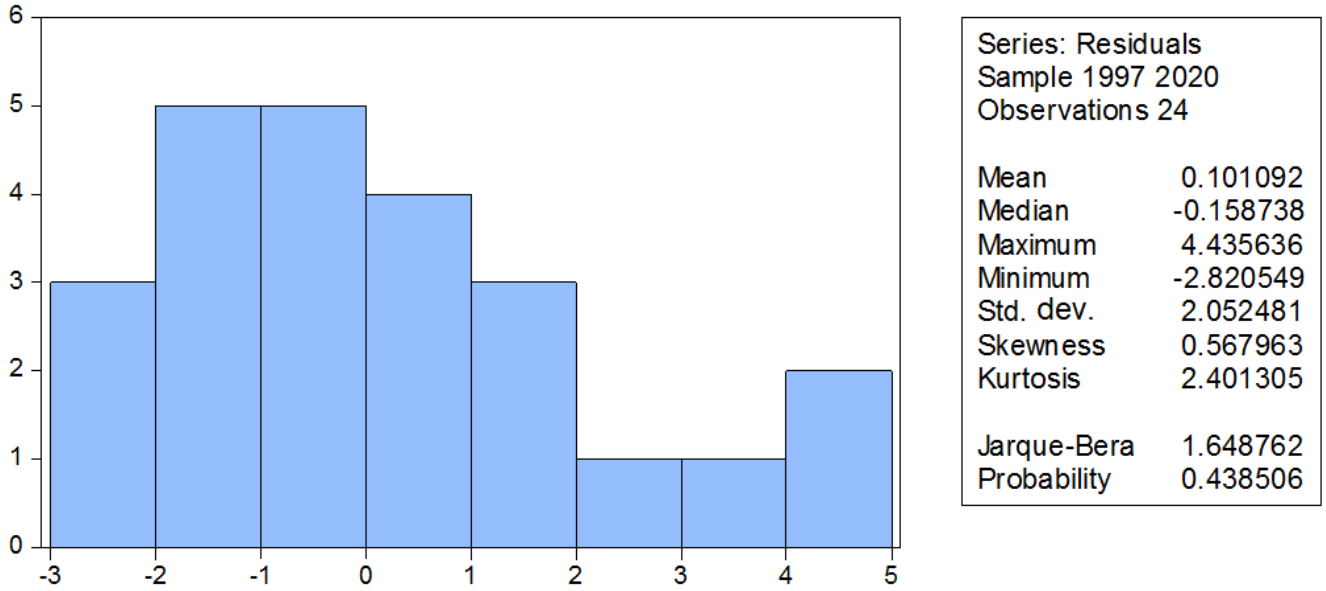

Figure 4.
Jarque-Bera normality residual diagnostic plot for model one.

4.5. Decision on Hypothesis One

At a level of significance of 0.05, the F-statistics is 3.4299, while the p-value of the F-statistics is 0.035 which is less than the 0.05 level of significance adopted. Therefore, the study rejected the null hypothesis and accepted the alternate hypothesis. This means that diversification had a positive effect on the GDP growth rate in Nigeria.

Table 5.
Regression result for model 2.

Dependent variable: Log_INFREXP				
Variable	**Coefficient**	**Std. error**	**t-statistic**	**Prob.**
Log_AGRY	1.686	1.171	1.44	0.166
Log_MINQ	-2.169	0.893	-2.429	0.025**
Log_OILEXPT	0.765	0.342	2.239	0.037**
Log_NONOILEXPT	0.324	0.291	1.112	0.279
EXR	0.001	0.001	0.710	0.486
Log_CPI	-1.474	1.119	-1.317	0.204
C	45.231	02.789	-3.442	0.253
R^2 = 0.897	Adj.R^2 = 0.870	F-test of long run variance = 0.037 (0.421)		

Note: *, **, and *** represent 1%, 5%, and 10% levels of statistical significance.
GDPGR = GDP growth rate; INFEXP = Infrastructural expenditure; OILEXPT = Oil export, NON-OILEXPT = Non-oil export; AGRY = Agricultural output; MINQ = Mining and quarrying, EXR = Exchange rate; CPI = Consumer price index (Inflation rate)

4.6. Test of Hypothesis 2-Model two

The model is reinstated and the results of the analysis

$$INFREXP_t = \alpha_0 + \beta_1 AGRY_t + \beta_2 MINQ_t + \beta_3 OILEXPT_t + \beta_4 NONOILEXPT_t + \beta_5 EXR_t + \beta_6 ICPI_t + \mu_t$$

$$INFREXP_t = 45.231 + 1.686 AGRY_t - 2.169 MINQ_t + 0.765 OILEXPT_t + 0.324 NONOILEXPT_t + 0.001 EXR_t - 1.474 ICPI_t + \mu_t$$

Investments in infrastructure are used here as a proxy for sustainable growth. This involves expenditures by the government on basic infrastructure or social amenities which are referred to as "social capital". In terms of overall impacts, the result for model two in Table 5 indicates that economic diversification has no significant impacts on sustainable infrastructural investments in Nigeria for the sampled years. This is based on the overall insignificant value of the F-test (*F-test: 0.037; P-value: 0.421*) for the long-run variance of the model.

Adjusted R^2 (0.870) is high. As a result, infrastructure requires a lot of attention to spur long-term growth. Based on the result of the adjusted R^2 (0.870), the included independent variables in the model determined the level of total variations in the growth rate of GDP by 87.1%. By implication, 87 percent of changes in infrastructural expenditure are caused by diversification in Nigeria while the remaining 13 percent are caused by other factors explaining changes in sustainable growth in Nigeria but were not captured in the model. For each of the independent variables in the model, the result in Table 5 further reveals that only mining and quarry subsector output and oil exports are significant in influencing the level of infrastructural investment. From the results, 1% in oil exports has the possibility of causing infrastructural investment growth of 0.76% while the same increase in mining and quarrying will reduce infrastructural investment by 2.16%.

It is noticed that despite insignificant values of agricultural output, oil exports, non-oil exports, exchange rate and inflation rate, the result indicated that aside from the CPI, other variables would potentially assist in improving sustainable

growth through infrastructure. These findings indicate that a significant overhaul through diversification is needed to push sustainable growth through infrastructural investments.

4.7. Residual Diagnostic Check for Model Two

As the results showed, many variables are insignificant. However, the Jarque-Bera residual plot of the estimates indicates that the estimated parameters of the model are normally distributed as indicated by the insignificant probability values of the test (see Figure 5).

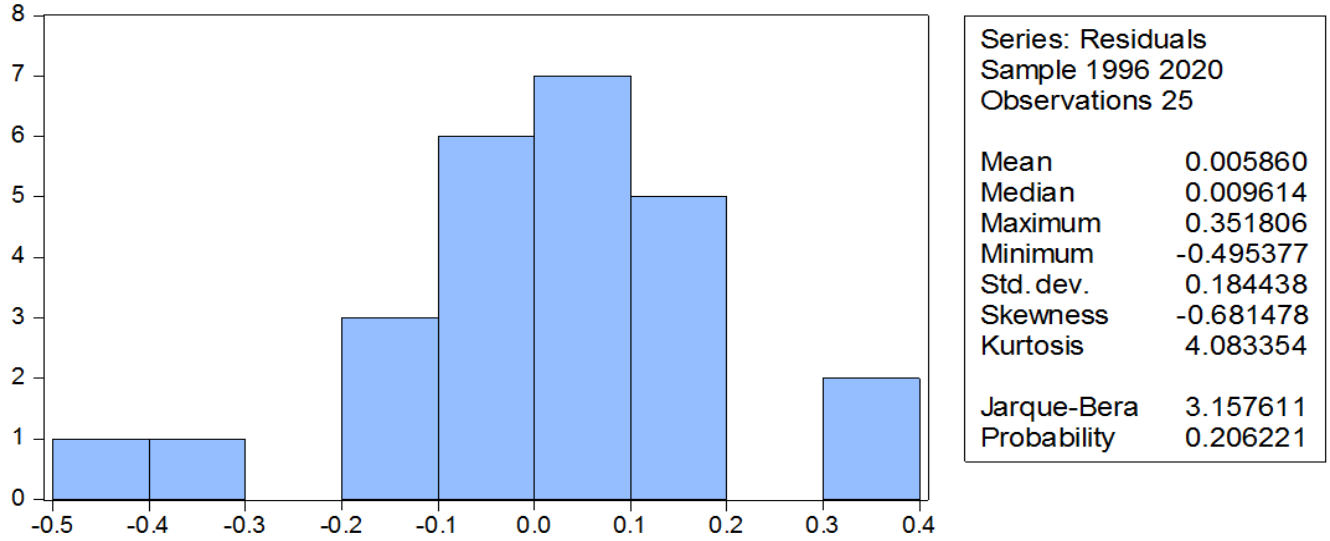

Figure 5.
Jarque-Bera normality residual diagnostic plot for model two.

4.8. Decision on Hypothesis One

At a level of significance of 0.05, the F-statistics is 0.037, while the *p-value* = 0.421 which is more than 0.05 level of significance adopted. Therefore, the study accepted the null hypothesis and rejected the alternate hypothesis. This means that diversification has not intensified adequately and tax revenue had not been optimally used to influence infrastructure expenditure in Nigeria. By implication, there is evidence of infrastructural deficit which had an inverse effect on GDP growth in Nigeria.

4.9. Discussions of Findings

Two models were estimated to test for the impact of economic diversification on sustainable growth in Nigeria. From the empirical findings, the results for model one helped reject the null hypothesis that diversification has no impact on the GDP growth rate as a measure of sustainable growth. Particularly, the magnitude of the impact of agricultural productivity on the economic growth rate was greater than all other sectors, even more than petroleum or oil exports which Nigeria has turned into its mainstay of foreign earnings. Even the mining and quarrying subsector outperformed oil exports as well. Oil exports (which Nigeria has concentrated on for a long time now) have a negative effect on the GDP growth rate while a similar magnitude of the positive effect is rather shown by non-oil exports. It is high time the economy was increasingly diversified. These positive findings of diversification on GDP growth rate are similar to the findings of other studies such as Owan, et al. [7]; Oyelami and Alege [20]; Esu and Udonwa [21]. On the contrary, the study found a different result [22]. The study found in model two that diversification has no significant impact on infrastructural investment in Nigeria. Indeed, oil and non-oil exports indicated no significant effects. This is no surprise as the state of infrastructural decay in Nigeria has long worsened even though the trend analysis in Figure 3 showed that infrastructural investment is on the rise in recent times.

Consequent to the results obtained in this study, the study recommended a holistic and detailed diversification of the economy to ensure multiple streams of revenue, especially to expand the informal sector of the nation. The study should optimize all potential tax revenue, make adequate investments in infrastructure and invest in the specific sensitive areas that will stimulate economic growth which in turn will contribute to the GDP growth rate of the country.

5. Conclusion and Recommendations

5.1. Conclusion

The study attempts to solve the problem of sustainable growth from the perspective of the diversification of the Nigerian economy. Two hypotheses were formulated as two models where each of the two hypotheses was tested. In hypothesis one (model one), the study tested the effect of diversification on GDP growth rate and the result revealed mixed results for each of the member variables of the model, agricultural output, non-oil export exchange rates had effects while oil exports and mining and quarrying exhibited insignificant effects. However, the combined result based on F-statistics demonstrated that economic diversification had a positive effect on sustainable growth through effective tax

implementation. Furthermore, the second hypothesis test revealed equally mixed results, with each of the variables of agricultural output, exchange rate and consumer price index exhibited a positive but insignificant effect, while oil exports revealed a positive but significant effect on infrastructural expenditure. But the combined statistical result of the model revealed that economic diversification had a positive but insignificant effect on infrastructural expenditure. By implication this could suggest that the government has not made an adequate investment toward the infrastructural development of the country. Therefore, there is an infrastructural deficit, dilapidated and deplorable roads, an epileptic power supply, a quite high poverty level, and embittered citizens living below an unacceptable standard of living. Unfortunately, Nigeria is an oil-producing country, a member of the Organization of Petroleum Exporting Country (OPEC) and richly endowed with oil and abundant resources. Unfortunately, bad leadership, wrong economic policies and unabated corrupt practices have plunged the country into a pitiable state, consistent double-digit inflation rate, a high unemployed rate, security challenges, and the Boko-Haram insurgency menace.

5.2. Recommendations

Based on the given results, the government should give adequate investment priority to infrastructural development and revisit its economic policies in order to improve further diversification of the economy. There are huge tax revenue leakages, especially the untapped tax revenue from the informal sector of the economy. There is an absence of eligible taxpayers' databases as only a few people pay tax in Nigeria. Tax compliance is very low because of a lack of tax justice and a dearth of evidence of optimal utilization of tax revenue. Therefore, the government should be transparent and responsible to the citizens in order to encourage them to fulfill their civic duty. The lawmakers should make impactful policies targeted at the diversification of the economy that will stimulate sustainable growth.

5.3. Contribution to Future Research

While a good number of studies have attempted to address the problem of sustainable growth in Nigeria, fewer of these studies have considered the issue of diversification as a possible solution from the perspective considered in this study. This study has put forward various options for diversify the economy beyond its mono-product economic dependence on crude oil revenue to address this gap. As a result of contributing to knowledge and spreading the frontiers, the study has highlighted the massive brought to the fore huge economic deficits that can accelerate economic development and sustainable growth. This study will no doubt be useful to investors, future researchers and professionals in the field of accounting and finance.

5.4. Scope for Future Research

The study of the diversification of the economy and sustainable growth in Nigeria provides new insight into the literature among the emerging and developing economies including Nigeria. The novelty of this study will contribute to an integral understanding of the significance of diversification in existing literature in Nigeria. However, some limitations were observed in the course of this study as the study did not cover some other aspects of diversification, like fisheries, mechanized farming, and the poultry aspect of agricultural expansion. Future researchers can carry out more research into these areas as there is massive virgin land and unprecedented numbers of unemployed youths capable of venturing into these areas if given the right motivation and required assistance.

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