Small and Medium Scale Enterprises and Economic Growth in Nigeria

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ABSTRACT

This study examines Small and Medium scale Enterprises (SMEs) and economic growth in Nigeria with the aid of secondary data sourced from World Bank Development Indicators (WDI), CBN annual statistical bulletin and bulletin of the national bureau of statistics (NBS) covering a period of 1990-2024. The method of analysis employed was the ordinary least square method of multivariate regression utilized in analyzing the log-linearized Model of real gross domestic product (RGDP) as dependent variable and Agriculture, Manufacturing, educational institution, Renewable energy SMEs as independent variables. The estimated model shows that that all four variables had a significant positive impact on RDGP thereby highlighting the importance of these four components to promoting economic growth. The study recommends that the government should assist these SMEs by granting loans, access to finance, reduced taxation and subsidies that will improve their productivity and in turn have a positive impact on economic growth in Nigeria.

Keywords; Small and Medium scale Enterprises, Economic Growth, OLS.

INTRODUCTION

The pursuit of economic growth has been a major goal of many developing nations of the world and Small and Medium Scale Enterprises (SMEs) have proved to be a major tool adopted by both the developed and developing nations to attain socio- economic growth and development. In Nigeria, SMEs provide the source of most new jobs. Over 70% of Nigeria enterprises are SMEs, which account for 60%-70% of employment in the country (Dike, 2015). As larger firms downsize and outsource more functions, the weight of SMEs in the economy is increasing. In addition, productivity growth and consequently economic growth is strongly influenced by the competition inherent in the birth and death, entry and exit of smaller firms. This process involves high job turnover rates and churning in labour markets which is an important part of the competitive process and structural change (Abosede, 2015).

The economic growth in many African countries such as Nigeria is directly proportional to the spurt in SME activities. SMEs play a very significant role in the rapid industrialization and development of Nigeria where approximately 80% of the total business ventures are SMEs. These SMEs together produce around 60% of the total industrial output and approximately 40% of the total profits and taxes achieved by the various industries in Nigeria (Okoye (2022). SMEs generates employment opportunities, stimulating indigenous entrepreneurs, improvement in per capita income, balanced regional development, education, empowerment of citizens, Stimulation of indigenous companies and providing self-sufficiency thereby alleviation of poverty rate in Nigeria (Abugu, 2013).

This research investigates the impact SMEs have on the economic growth in Nigeria but will take a special turn of decomposing SMEs into SMEs on agriculture, manufacturing, educational institution and renewable energy.

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In the context of agriculture, small and medium enterprises (SMEs) play an important role in the sector. They account for a large portion of the agricultural workforce and contribute to local food production and economic development. However, SMEs in the agricultural sector often face challenges, including limited access to finance, poor markets, technology, land tenure systems, and climate change (Fatai, 2011). Despite these challenges, SMEs in agriculture are a vital part of the economy and can contribute to sustainable development. In the manufacturing sector, SMEs play a vital role in the economy. They include small businesses that produce goods such as textiles, furniture, and machinery. These businesses often use local resources to produce export products, employ local workers by creating jobs, provide access to resources and training and also produce parts for larger manufacturers thereby contributing to economic growth. They are as well faced with challenges which includes but not limited to limited access to technology, finance, and skilled labor (Zhang and Leung, 2018).

There are also many SMEs that provide educational services. These include private schools, training centers, and professional development organizations. In many cases, these SMEs are vital to the communities they serve, providing access to quality education and training opportunities. They are as well faced with challenges in terms of funding and resources, increasing cost of higher education, the need for specialized equipment and training facilities. These deficiencies do not change the fact that they contribute to the growth of the Nigerian nation. In the renewable energy sector, SMEs play a key role. These businesses include solar panel installers, wind turbine manufacturers, and hydropower developers. These SMEs help to develop and install renewable energy systems that can benefit communities and the environment. However, these businesses may face challenges in obtaining financing, availability of highly skilled workers and attracting customers due to poorly standardized regulations for renewable energy projects. This is because the renewable energy sector is still relatively new, and it can be difficult to convince consumers and investors of the benefits of switching to renewable energy (Yotam, 2015).

In the bid to boost the performance of SMEs in the country, this led to the introduction of policies by the government in these areas to sustain growth. One key initiative is the National Agricultural Land Development Authority (NALDA), which was established to help small-scale farmers gain access to land and credit. NALDA also offers training programs to help farmers improve their farming practices. Others include the Rural Access and Agricultural Marketing Project (RAAMP) aimed at improving rural roads, markets, and storage facilities for agricultural activities, the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) established to provide support and assistance to small and medium-sized enterprises in the country by offering training, advisory services and access to finance and business development services. Additionally, the government has implemented policies such as the Industrial Development Fund (IDF), which provides loans and other forms of financial assistance to small and medium-sized businesses in the manufacturing sector at low interest rates, making it easier for them to access the capital they need to invest in their businesses.

Other interventions in the renewable energy SMEs is the establishment of the Rural Electrification Agency (REA), set up to provide electricity to rural communities through renewable energy sources and the establishment of the National Renewable Energy and Energy Efficiency Policy, aimed at promoting the use of renewable energy and encourage the development of SMEs in the sector. The educational sector was not left out with the establishment of the National Board for Technical Education (NBTE) to regulate technical and vocational education in the country and the National Business and Technical Examination Board (NABTEB) created to assess and certify the competence of students in technical and vocational education.

Despite these components of SMEs that have the potentials of attracting and sustaining economic growth, Nigeria's growth trajectory seem to be dwindling thereby creating a gap in the infrastructural development process of the country (Okoli, Nwokoye and Ezedebego, 2023). Also not minding that emphasis has shifted from large-scale capital intensive enterprises to small and medium scale ones because of their potentials for developing domestic linkages for rapid and sustainable industrial development, empirical literature on the impact of SMEs on economic growth in Nigeria is mixed. While some studies found a positive impact [Iwuji

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(2020); Okoye (2022); Okoroafor (2023)], others finding a negative impact [(Adenuga, (2015); Abugu (2013); Nweze 2018]. This research therefore aims to add to the existing body of literature by investigating the exact nature of the impact SMEs have on economic growth in Nigeria by providing answers to the following questions;

1: What is the impact of manufacturing SMEs on economic growth in Nigeria?
2: What is the impact of Agricultural SMEs on economic growth in Nigeria?
3: What is the impact of Educational institution SMEs on economic growth in Nigeria?
4: What is the impact of Renewable energy SMEs on economic growth in Nigeria?

By understanding these issues, policymakers and researchers can develop effective strategies for promoting economic growth in Nigeria which is all this research work is set to achieve. The hypotheses for the variables were tested in null form. Thus, the rest of the paper is structured into literature review, research methodology, data analysis and interpretation or results and conclusion and recommendations.

LITERATURE REVIEW

Conceptual Review of Literature

Economic growth is the increase overtime of an economy capacity to produce those goods and services needed to improve the wellbeing of the citizens in increasing number and diversity. The growth reflects a steady process by which the productive capacity of the economy increased overtime to bring about rising level of national income. Economic growth refers to an increase in aggregate or overall production in an economy. It is the increase in the real per capita income of a country over a long period of time. [Aigbokhan (2010); Jhinghan (2016); Todaro (2007)].

SME on the other hand is an acronym that stands for small and medium scale enterprises. Small and medium-sized enterprises (SMEs) are non-subsidiary, independent firms which employ less than a given number of employees. According to the National Council on Industry meeting in Markudi, Benue State, reported by Udechukwu (2013), a small-scale industry is one with total capital employed of over N1.5million but not more than N50million including working capital but excluding cost of land or a labour size of 11-100 workers while a medium-scale Industry is an industry with a total capital employed of over N50million but not more than N200million including working capital and a labour size of 101-300 workers. This research has adopted these definitions because it is about the most current definition, with the defining authority being the highest organ on commerce and industry matters in Nigeria and the two prominent parameters in business size classification (capital and workforce) are included.

Theoretical Review of Literature

This study is anchored on Harrod-Domar Economic Growth Model. Harrod-Domar growth model is an economic model that describes the relationship between capital investment, labor productivity, and economic growth. It can be applied to the manufacturing, agricultural, educational, and renewable energy sectors to understand the factors that contribute to economic growth in these sectors. For example, in the manufacturing sector, a high level of capital investment can lead to increased labor productivity and output. In the agricultural sector, increased investment in agricultural machinery and technology can lead to higher crop yields and increased output. In the educational sector, improved access to education and training can lead to higher productivity and economic growth. In the renewable energy sector, investments in new technologies such as solar, wind, and hydropower can lead to increased output and higher productivity. The Harrod-Domar model also considers the effects of savings and population growth on economic growth. For example, higher savings rates can lead to increased capital investment and economic growth. On the other hand, rapid population growth can reduce the level of investment per capita and hinder economic growth. The Harrod-Domar model provides a framework for analyzing the relationship between investment,

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

productivity, and economic growth in the manufacturing, agricultural, educational, and renewable energy sectors.

The Harrod-Domar Model suggests that economic growth rates depend on two things, the level of savings and the capital-output ratio. The level of savings is the average propensity to save which is the ratio of national savings to national income and higher savings enable higher investment. While the capital-output ratio is the amount of capital needed to increase output. A lower capital-output ratio means investment is more efficient and the growth rate will be higher, while a high capital-output ratio means investment is inefficient. This model is of great importance because it is argued that in developing countries low rates of growth and development are linked to low saving rates. This creates a vicious cycle of low investment, low output and low savings. In order to boost economic growth rates, it is necessary to increase savings. Higher savings creates a virtuous circle of self-sustaining economic growth. The transfer of capital to developing economies would enable higher growth which in turn will lead to higher savings and growth will become more self-sustaining. In this research, economic growth would be used to proxy economic development due to the difficulty encountered in capturing economic development.

Empirical review of literature

Ojeka (2011) assessed the impact SMEs have on economic growth in Nigeria. The study was based on an analysis of time series annual data (1980-2008) applying the Spearmans Rank Correlation. The variables used in the study were real GDP, government expenditure, SMEs, inflation rate. The study revealed a significant negative relationship between SMEs and economic growth in Nigeria and the study recommended that SMEs should be funded adequately by governments to enable them play major roles as engines of growth economic development. In this sense, the microfinance policies should be restructured in such a manner that prospective SMEs can have access to loans on a sustainable basis in partnership with banks in the areas of feasibility study, project development and finance.

Aruwa (2012) examined the role of small and medium scale enterprises in economic growth in Nigeria from 1976-2009 while employing the ordinary least square. The variables used in the study were SMEs, GDP, government expenditure and real GDP. The study revealed that small and medium enterprises provided employment opportunities, training ground, and harness utilization of local resources. The study concluded that a good development strategy if employed by these industrialists will grow to large-scale capital intensive. The study recommends that SMEs should source their loans from the financial institutions where interest rates are low.

Ugwu (2014) investigated the role of Small and Medium Scale Enterprises (SMEs) in economic growth in Nigeria, between 2001 and 2012 while employing the OLS method of analysis. The finding show that SMEs' income captured by their contributions to GDP, are statistically significant in explaining the level of employment and hence poverty reduction. Also the funding of SMEs and the level of government participation are not significant to the growth of SMEs measured by their level of income. The recommendations were made amongst which are: that government should provide mechanism for SMEs to have access to loans with long payback period; and that interest rate should be reduced to a single digit to encourage entrepreneurs' innovativeness.

Dike (2015) examined the role of small and medium enterprises in poverty eradication in Nigeria from 1970-2014 while employing OLS method of analysis. Therefore, the study revealed that small and medium enterprises has negative and significant relationship between poverty rate and SMEs in Nigeria. The study concluded that a good development strategy if employed by these industrialists will grow to large-scale capital intensive. The study recommended that SMEs should source their loans from the financial institutions where interest rates are low.

Dimoji and Onwuneme (2016) carried out study on small and medium scale enterprises and sustainable economic development in Nigeria. The study employed descriptive statistics. The study discovered that

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

small and medium scale enterprises provide the tools for sustainable economic liberation in Nigeria. The study recommended that the government therefore should protect the manufacturing industries by way of banning and increasing tariff on import of similar goods so as to promote our indigenous entrepreneurs. Besides, recognition of the small scale industries as a base to industrialization will assist in achieving a maximum productivity, efficiency and total independence in the near future. This study do not include the level of infrastructure development and Autoregressive distributive lag (ARDL) as the method of analysis.

Orugun (2017) examined poverty issue and the entrepreneurial engagement of small scale enterprises in Nigeria from 1980-2016. Data for the study were analyzed with the aid of descriptive statistics, correlation analysis and regression. The variables used in the study were SMEs, GDP, and unemployment rate and government expenditure. The finding indicate a positive correlation between entrepreneurship through SMEs and poverty level, and significant positive correlation between poverty and unemployment Nigeria. The study recommended that it is imperative that policy makers, governments and their agencies provide the technical, technological, financial, assistance and infrastructures needed for the opportunities in the SMEs to be harnessed optimally.. This study do not include the level of infrastructure development and Autoregressive distributive lag (ARDL) as the method of analysis.

Nweze (2018) examined the relationship between small and medium enterprise (SMEs) growth and economic growth in Nigeria using the time series data from 1985-2017 applying the error correction model method of analysis. The study found that there was a no significant correlation between SMEs growth and economic growth in Nigeria. The study recommended that government should as a matter of urgency assist prospective entrepreneurs to have access to finance and necessary information relating to business opportunities, modern technology, raw materials, market, plant and machinery which would enable them to reduce their operating cost and be more efficient to meet the market competitions.

Iwuji (2020) investigated the impact of SMEs on economic growth in Nigeria using the time series from 1979-2018 while employing the ordinary least square. The variables used were unemployment rate, real GDP, SMEs contribution to GDP, gross capital formation, GDP. The study found that SMEs has an impact on poverty alleviation in Nigeria. The study recommended that government should introduce a revolving loan scheme for small and medium enterprises; she can equally set up a team to monitor the use of such loan so as to avoid its diversion and to this and Nigeria Industrial Development Bank (NIDB), Nigeria Bank of Industry (NBI) and Nigeria Agricultural and Cooperatives Bank (NACB) should gear up towards assisting the small and medium enterprises in satisfying their capital needs.

Adebisi and Omojola (2020) analyzed data from the Central Bank of Nigeria to determine the impact of SMEs on economic growth in Nigeria. They found that SMEs contribute significantly to economic growth through job creation, revenue generation, and wealth distribution. They also noted that the impact of SMEs on economic growth is influenced by factors such as access to finance, availability of infrastructure, and government policies. Overall, they concluded that SMEs play a crucial role in the economy and have the potential to drive growth if given the necessary support.

Odu and Zofo (2020) conducted a study to assess the impact of SMEs to economic growth in Nigeria, using data from the Central Bank of Nigeria and the National Bureau of Statistics. They found that SMEs contribute significantly to GDP, employment, and exports. They also found that the contribution of SMEs to economic growth is hampered by factors such as access to finance, corruption, and infrastructure. They recommended that the government should provide more support for SMEs, such as through the provision of credit facilities, infrastructure development, and business development services.

Bukar and Umar (2021) studied enhancing small and medium scale business opportunities in Nigeria in a COVID 19 ravaged era by using secondary data from the Central Bank of Nigeria and the National Bureau of Statistics, they found that SMEs account for a significant portion of GDP and employment, and that they have a positive impact on poverty reduction. They also noted that access to finance, infrastructure, and markets are key challenges facing SMEs in Nigeria. They suggested that the government should put in place

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

policies and programs to address these challenges in order to maximize the contribution of SMEs to economic growth and poverty reduction.

Kilanko (2021) analyzed the relationship between SMEs and economic growth in Nigeria. She used secondary data from the National Bureau of Statistics and the World Bank. She found that SMEs contribute to economic growth through job creation, the provision of goods and services, and the expansion of the tax base. However, she also found that the impact of SMEs on economic growth is constrained by factors such as limited access to finance, poor infrastructure, and lack of market access. She suggested that the government should provide more support to SMEs in order to boost their contribution to economic growth.

In their research, Umari and Jibril (2021) explored the impact of SMEs on the Nigerian economy from 2009 to 2019. They used secondary data from the National Bureau of Statistics and the Central Bank of Nigeria to analyze the contribution of SMEs to GDP, employment, and poverty reduction. They found that SMEs account for a significant portion of economic activity, and that their contribution to GDP and employment has been growing over time. They also noted that the contribution of SMEs to poverty reduction is not as significant as their contribution to GDP and employment. They suggested that the government should focus on policies that promote the growth of SM

In their research, Ebikwo and Eboigbodin (2022) focused on the impact of SMEs on the economic growth of Nigeria through employment generation. They used secondary data from the Central Bank of Nigeria, the National Bureau of Statistics, and the International Monetary Fund. They found that SMEs make a significant contribution to employment in Nigeria, with a higher share of the total workforce than large firms. However, they also found that the quality of jobs in SMEs is often lower than in larger firms, with lower wages and less job security. They suggested that the government should focus on policies to improve the working conditions of workers in these SMEs in order to boost their productivity.

Okoye (2022) examined contribution of small and medium scale enterprises to the growth of Nigeria’s economy in which one hundred and forty two (142) questionnaires were administered randomly to the entire employee population of the SME companies that are registered with SMEDAN in Lagos Nigeria. The study found out that SME development affects poverty alleviation and also Training organized by SMEDAN affects SMEs employment creation. It was discovered that the small and medium enterprises provided employment opportunities, training ground, harnesses utilization of local resources and also acts as a pillar hold of a nation, Nigeria inclusive. The study concluded that a good development strategy if employed by these SMEs will grow to large-scale capital intensive. The study recommended that SMEs should source their loans from the financial institutions where interest rates are low. This study do not include the level of infrastructure development and Autoregressive distributive lag (ARDL) as the method of analysis.

Nwachukwu (2023) research focused on the performance of small and medium enterprises in Nigeria in promoting sustainable economic growth in Nigeria. She used secondary data from the National Bureau of Statistics to analyze the impact of SMEs on economic growth, job creation, and poverty reduction. She found that SMEs make a significant contribution to these areas, but that the impact is constrained by factors such as lack of access to finance, lack of technical know-how, and poor infrastructure. She suggested that the government should put in place policies to address these constraints in order to fully harness the potential of SMEs in promoting sustainable economic growth.

Okong and Egbobor's (2023) research focused on the impact of SMEs on economic development in Nigeria, with a specific focus on small-scale businesses. They used data from the National Bureau of Statistics to analyze the impact of SMEs on economic growth, employment, poverty reduction, and trade. They found that SMEs play a significant role in the Nigerian economy, but that there are several constraints that limit their potential. These include inadequate infrastructure, limited access to finance, and a lack of appropriate government policies. They recommended that the government should address these issues in order to maximize the benefit of SMEs for the Nigerian economy

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

Okoroafor (2023) investigated the financial performance of SMEs in Nigeria, with a focus on the manufacturing sector. He used data from the National Bureau of Statistics and the World Bank to assess the contribution of SMEs to the manufacturing sector. He found that SMEs account for a significant portion of the manufacturing sector, and that they contribute to growth through job creation, the provision of goods and services, and the generation of income. However, he also found that the impact of SMEs on economic growth is constrained by factors such as inadequate infrastructure, limited access to finance, and policy instability.

Olawale and Akpan (2024) studied Impact of Commercial Bank Credit To Small and Medium Enterprises on Economic Growth in Nigeria using time series data from 1981 to 2022. Auto Regressive Distributed Lag Model was the econometric technique employed, to determine both the short and long term bond between the variables employed. The results show a negative and undeniable short run link between only the rate of lending of the commercial bank and the economy's rate of advancement. However, in the long term period, its impact was positive and significant. The study therefore recommends that checks and balances be put by government and commercial banks to ensure the loans issued are used strictly for its aim. Also the rate of bank lending should be controlled in order not to scare Small and Medium Enterprises from benefitting from the commercial bank lending activities as this will ensure economic growth in Nigeria.

METHOD OF THE STUDY

The Theoretical framework adopted for this research is the Leontief input output theory. Leontief (1966) input-output model is a quantitative economic technique used to analyze the interdependencies between different sectors of an economy. The model shows how inputs from one sector are used to produce outputs in another sector, and how changes in one sector can lead to changes in other sectors. In the context of manufacturing, agriculture, renewable energy, and educational SMEs, the model can be used to understand the flow of goods, services, and resources among these sectors. This theory is used to analyze the interdependence of various economic sectors and how changes in one sector can affect other sectors. The Leontief input-output model's equation can be written as Y = f (A), where Y is the output vector and f (A) represents the total production of goods and services as a function of the input-output matrix A.

$Y= f(A)$

Where

Y represent RDGP

A represent SMES

SMEs further decomposed into manufacturing, agriculture, educational institution, renewable energy

$RDGP= f(AGR,MFR,EDUI,RE)$

$RGDP = \beta o + \beta_1 AGR + \beta 2MFR + \beta 3EDUI + \beta 4RE + \mu$

However, there is a need to standardize the variables so as to interpret their partial slope coefficient in terms of elasticities, hence the natural log of the variables are used. This is expressed below:

$LnRGDP = \beta o + \beta_1 LnAGR + \beta 2LnMFR + \beta 3LnEDUI + \beta 4LnRE\ \mu$

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

RESULT PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS

This section centers on the presentation and analysis of data used, interpretation of the result and discussion of the findings from the analysis conducted.

Unit root properties of the variables

Table 1 Unit root test results

Variables	ADF Statistic @ First Difference	ADF Critical Value @ First Difference	Order of Integration
LnRGDP	-3.637704	-3.587527	I (1)
LnAGI	-3.653727	-3.587527	I (1)
LnMFR	-4.379140	-3.552973	I (1)
LnEDUI	-3.604251	-2.981038	I (1)
LnRE	-3.110922	-2.954021	I (1)

Source: Researcher's Computation (2025)

Evidence from unit root table above shows that all the variables are stationary at first difference, since the decision rule is to reject null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute terms), and accept stationarity when ADF statistics is greater than criteria value. Having obtained stationarity at first difference, the Johansen co-integration can now be conducted as this meets the condition under which the test could be applied.

Co-integration Test

This step seeks to identify the number of co-integrating relationships that exist among these variables. This study used the Johansen co-integration test. Since the unit root test shows that none of the variables is stationary at level, rather they integrated at their first difference, the study therefore test for cointegration among these variables. The result is presented and summarized in table 2

Table 2 Summary of Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.796286	124.4101	95.75366	0.0001
At most 1 *	0.587882	71.90578	69.81889	0.0337
At most 2	0.415398	42.65309	47.85613	0.1412
At most 3	0.286495	24.93792	29.79707	0.1637
At most 4	0.257540	13.79823	15.49471	0.0886
At most 5 *	0.113383	3.971282	3.841466	0.0463

Source: Researcher's computation (2025)

Given the results generated, the trace test indicates 3 cointegrating equations at the 0.05 level of significance. This denotes that the null hypothesis of no cointegrating equation is rejected at 0.05 level of significance. Thus, we conclude that a long run relationship exist among the variables.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

Short Run Analysis

Table 3 Summary of Short Run Analysis Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.757742	1.682260	5.800377	0.0057
LnAGI	2.058638	0.044161	46.61665	0.0146
LnMFR	2.938299	0.285040	10.30837	0.0026
LnEDUI	4.287585	0.172812	24.81069	0.0069
LnRE	1.190094	0.407327	2.921719	0.0067
R-squared	0.853009	Mean dependent var	4.305583	
Adjusted R-squared	0.827666	S.D. dependent var	0.373141	
S.E. of regression	0.154903	Akaike info criterion	-0.737235	
Sum squared resid	0.695850	Schwarz criterion	-0.470603	
Log likelihood	18.90160	Hannan-Quinn criter.	-0.645193	
F-statistic	33.65828	Durbin-Watson stat	1.735109	
Prob(F-statistic)	0.000000			

Source: Researcher's computation (2025)

From table 3, it is observed that agricultural SMEs output (LnAGI), manufacturing SMEs output (LnMFR), number of educational SMEs (LnEDUI), and renewable energy SMEs (LnRE) have shown to exhibit a positive impact on real gross domestic product in Nigeria. Thus, increase in any of the aforementioned explanatory variables, will cause an increase in the growth rate of GDP in Nigeria and vice versa. As a matter of fact, all the variables had positive relationship with economic growth in Nigeria and thus, all conform to the a priori expectation of the study.

Also the coefficient of determination (R^2) is given as 0.853009, which shows that the explanatory power of the variables is extremely high and very strong. This implies that about 85% of the variations in the growth rate of Nigerian economy, are being accounted for or explained by the variations in the explanatory variables. While other possible determinants of economic growth, not captured in the model explain about 15% of the variation in GDP growth rate in Nigeria. The adjusted R^2 supports the claim of the R^2 with a value of 0.827666 indicating that about 83% of the total variation in the dependent variable (economic growth) is explained by the independent variables. Thus, this supports the statement that the explanatory power of the variables is extreme high and very strong.

Economic Criteria

In this subsection, the **t-statistic and the F-statistic** are used to evaluate the result obtained from the study model.

The t-statistic

The t-test is used to know the statistical significance of the individual parameters. Two-tailed tests at 5% significance level are conducted. Here, the study compare the calculated t-statistic with the tabulated t-statistic at $t_{\alpha/2} = t_{0.05} = t_{0.025}$ (two-tailed test). The result is shown on Table 4.

Degree of freedom (df) = n-k = 37- 6 = 31

So, the study has:

$T_{0.025(29)} = 2.045$ Tabulated t-statistic

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

Table 4 Summary of t-statistic

Variables	t-calculated (t_{cal})	t-tabulated ($t_{\alpha/2}$)	Conclusion
Constant	5.800377	2.045	Statistically Significant
LnAGI	46.61665	2.045	Statistically Significant
LnMFR	10.30837	2.045	Statistically Significant
LnEDUI	24.81069	2.045	Statistically Significant
LnRE	2.921719	2.045	Statistically Significant

Source: Researcher's computation (2024)

The outcome of all the variables included in the model are statistically significant since they are higher than the tabulated t statistic.

The F-statistic

The F-test is applied to check the overall significance of the model. The F-statistic is instrumental in verifying the overall significance of an estimated model. The hypothesis tested is:

H_0: The model has no goodness of fit

H_1: The model has a goodness of fit

Decision rule: Reject H_0 if $F_{cal} > F_{\alpha}$ (k-1, n-k) at $\alpha = 5\%$, accept if otherwise.

Where

V_1 / V_2 Degree of freedom (d.f)

V_1 = n-k, V_2 = k-1:

Where; n (number of observation); k (number of parameters)

Where k-1 = 5-1= 4

Thus, n-k = 35- 5 = 30

Therefore: $F_{0.05(4, 28)} = 2.95$ (From F-table)

F-statistic = 50.09406 (From Regression Result)

Therefore, since the F-calculated > F-table as observed in the study reject H_0 and accept H_1 that the model has goodness of fit and is statistically different from zero. In other words, there is significant impact between the dependent and independent variables of the study.

Econometric Criterion – Second Order Test

In this subsection, the following econometric tests are used to evaluate the result obtained from the study model; autocorrelation, multicollinearity and heteroscedasticity.

Test for Autocorrelation

Using Durbin-Watson (DW) statistics which the study obtains from the regression result in table 3, it is observed that DW statistic is 1.735109 or approximately 2. This implies that there is no autocorrelation since DW is approximately equal to two.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue IV April 2025

Test of Multicollinearity

This means the existence of a perfect or exact, linear relationship among the explanatory variable of a regression model. This will be used to check if collinearity exists among the explanatory variables. The basis for this test is the Variance Inflation Factor (VIF). The result is presented in Table 5

Table 5 Summary of Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	2.829999	4127.969	NA
LnAGI	0.001950	14.20320	12.58012
LnMFR	0.081248	7756.053	25.48463
LnEDUI	0.029864	367.9283	1.710280
LnRE	0.165915	1418.968	12.18285

Source: Researcher's computation (2025)

Decision Rule: From the rule of Thumb, if VIF coefficient is greater than 10, the study conclude that there is multicollinearity but if the coefficient is less than 10, there is no multicollinearity. The study therefore, concluded that the explanatory variables are not perfectly linearly correlated, as no coefficient exceeded 10.

Test for Heteroscedasticity

This test is conducted to see whether the error variance of each observation is constant or not. The hypothesis testing is thus:

H_0: There is a homoscedasticity in the residuals

H_1: There is a heteroscedasticity in the residuals

The decision rule is to accept the null hypothesis that there is a homoscedasticity in the residuals if the probability of the calculated F-test statistic (F) is greater than the 0.05 level of significance chosen in the study. Otherwise, the alternative hypothesis is accepted. Hence, p(F) = 0.1272 this means that the probability F statistic is greater than 0.05 level of significance. Therefore, the study accepted the null hypothesis that the model has no heteroscedasticity in the residuals. This is shown in Table 6.

Table 6 Heteroscedasticity White Test

F-statistic	1.820384	Prob. F(20,14)	0.1272
Obs*R-squared	25.27926	Prob. Chi-Square(20)	0.1910
Scaled explained SS	12.33193	Prob. Chi-Square(20)	0.9042

Source: Researcher's computation (2025)

Evaluation of Research Hypotheses

In testing the working hypotheses, which partly satisfies the objectives of this study, the study employs a 0.05 level of significance. In so doing, the study is to reject the null hypothesis if the t-value is significant at the chosen level of significance, otherwise, the alternative hypothesis is accepted.

Hypothesis One

H_0: Agricultural SMEs output does not significantly impact on economic growth in Nigeria

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Applying the above decision rule to the first hypothesis, Table 5 shows that the calculated absolute t-value of 46.61665 is greater than tabulated absolute t-value of 2.045. This results in accepting the alternative hypothesis that agricultural SMEs output significantly impact on economic growth in Nigeria.

Hypothesis Two

H_0: Manufacturing SMEs output does not significantly impact on economic growth in Nigeria

Applying the above decision rule to the second hypothesis, Table 5 shows that the calculated absolute t-value of 10.30837 is greater than tabulated absolute t-value of 2.045. This results in accepting the alternative hypothesis that manufacturing SMEs output significantly impact on economic growth in Nigeria.

Hypothesis Three

H_0: Educational SMEs output does not significantly impact on economic growth in Nigeria

Applying the above decision rule to the first hypothesis, Table 5 shows that the calculated absolute t-value of 24.81069 is greater than tabulated absolute t-value of 2.045. This also results in accepting the alternative hypothesis that educational SMEs output significantly impact on economic growth in Nigeria.

Hypothesis Four

H_0: Renewable Energy SMEs output does not significantly impact on economic growth in Nigeria

Applying the above decision rule to the first hypothesis, Table 5 shows that the calculated absolute t-value of 2.921719 is greater than tabulated absolute t-value of 2.045. This finally results in accepting the alternative hypothesis that renewable energy SMEs output significantly impact on economic growth in Nigeria.

DISCUSSION OF FINDINGS

The purpose of this study is examine the impact of agriculture, manufacturing, educational institution and Renewable energy SMEs on economic growth in Nigeria. The coefficient value of Agricultural SMEs has positive relationship with real gross domestic product and it is statistically significant at 5% level of significance. Hence, an increase in agricultural sector SMEs output contributes to RGDP by producing more food crops and livestock, which are essential for domestic consumption and export which increases real gross domestic product. The coefficient implies that all things being equal a 1 percent increase in Agricultural SMEs output, on the average will increase real gross domestic product by about 2 percent and vice versa. This is in conformity to Economic a prior expectation. This finding is similar to that obtained in the manufacturing SMEs output in Nigeria which also has a positive and statistically significant impact on real gross domestic product in Nigeria. By stimulating further action along the value chains from raw materials to finished goods, manufacturing SMEs expands Nigeria's export base and boosts our GDP. Manufacturing also strengthens economies by cascading growth in other sectors. This aligns with the findings of Okoroafor (2023) who also observed that Manufacturing SMEs output has a positive and statistically significant impact economic growth.

The Educational SMEs output is also positive and statistically significant. This means that an increase in educational SMEs output will positively improve real gross domestic product in Nigeria. Increase in Educational SMEs output enriches people's understanding of themselves and world, improves the quality of their lives and leads to broad social benefits to individuals and society. It raises people's productivity and creativity which promotes entrepreneurship and technological advancements and ultimately increases economic growth. This is in consonance with theoretical expectations as educational growth is a vital pillar of growth and development. This finding is consistent with that of Okoye (2022) who also observed that education training improve economic growth. Finally, the renewable energy SMEs output in Nigeria has positive and statistically significant impact on real gross domestic product. This may be due to the nature of

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renewable energy SMEs which are generally labor- intensive and employs primary indigenous resources, so they generally create more jobs for residents in the country. This brings about increase in real gross domestic product and economic productivity. The post estimation tests also indicate the absence of autocorrelation, multicollinearity and heteroscedasticity in the model employed in the study. It is worthy of note at this point that policy shifts that will bring about expansion of output of agricultural SMEs, manufacturing SMEs, educational SMEs and renewable energy SMEs in Nigeria, will all bring about an increase in the growth rate of Nigerian economy and vice versa.

CONCLUSION AND RECOMMENDATION

The study examined the impact of agriculture, manufacturing, educational institution and Renewable energy SMEs on economic growth in Nigeria. Thus, the general conclusion that emerged from this study is that during the period under review, better performance of the SMEs, particularly, manufacturing, agricultural, renewable energy and educational institutions, is an effective strategy for economic growth in Nigeria.

The study therefore recommends thus:

1. The government should subsidize farm implements and input such as fertilizer, seedlings, and pesticides to SMEs. They should also create easier access to agricultural grants and loans to SMEs, reduce tax for small scale agro businesses and create an enabling environment for the agricultural sector so that it will be attractive to accommodate all classes of the Nigerian work force. This will increase the capacity utilization, maximize labour productivity and increase output in the agriculture sub-sector which will ultimately increase real gross domestic product (economic growth).
2. Since Manufacturing SMEs output has a positive and statically significant impact on real gross domestic product, the government should assist the manufacturing SMEs by providing external financing support through the Bank of Industry (BOI) and internally advance loans and grants to SMEs manufacturers to increase their capacity utilization in order to maximize labour productivity in the sector. The government should also create bodies that would oversee the training, development and provision of technical assistance to small and medium scale manufacturers, as well as granting them tax incentive.
3. The government should support private schools, tutoring centers, language schools, and vocational training centers by ensuring through the federal ministry of education that teachers in these institutions are properly trained and equipped to inform and educate their students, ensure proper funding of these institutions and avoid overcrowding in class rooms to ensure efficient teacher-student ratio which is very vital to the learning process.
4. Lastly, the government and other agencies should assist companies that develop, manufacture, and distribute renewable energy technologies by providing financial credit to SMEs in this sector, granting them tax incentives and create subsidies for businesses that are into renewable energy.

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