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# IMPACT OF ECONOMIC DIVERSIFICATION ON EMPLOYMENT AND ECONOMIC GROWTH IN NIGERIA

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**Abstract**

This study examined the employment and economic growth impacts of economic diversification in Nigeria using time series data from 1970 to 2022. The ADF unit root test for data stationarity showed that all the variables under study were stationary. The Johansen cointegration test showed that there was a long-run relationship among the variables. The result of the 2SLS regression revealed that while economic diversification had a significant positive impact on employment in Nigeria but an insignificant impact on economic growth of Nigeria. However, the impact of economic diversification on employment in Nigeria was infinitesimal in the level of its contribution to employment in Nigeria and its impact on economic growth did not show desired result. The study suggests that every economic diversification project should be matched with employment targets; that the government should intensify efforts to increase the magnitude of diversification; that the industrial sector should be given greater attention with respect to economic diversification for employment in Nigeria; that the federal government should establish a National Board for Economic Diversification, to specialize and concentrate on the modus operandi for economic diversification in Nigeria.

**Keywords**: Agricultural employment, economic growth, economic diversification, industrial employment, employment in the services sector, sustainable economic growth.

**JEL Classification Codes**: E24, O47

## 1. Introduction

Diversification of economic production for employment and sustainable growth of the economy is a critical phenomenon for a developing country. Nigeria's need for sustainable economic growth and development propelled motivation for this study. The quest for Nigeria's achievement of the United Nation's Sustainable Development Goal (SDG) number 12, which stated that by 2030, all countries should achieve sustainable production and consumption patterns became imperative. Diversification of production for sustainable economic growth became a critical phenomenon. The eighth United Nations sustainable development goal stated that every country in the world should achieve decent employment by 2030. Therefore, the employment of labour is indispensable in economic development discourse. Inadequate employment is a threat to the economic

development of Nigeria because employment is an indicator of sustainable economic growth and development. Thus, the impact of economic diversification on employment and the economic growth of Nigeria became a critical hunch to be subjected to empirical investigation.

Nigeria employed a growth strategy that was based on its natural endowment, being propelled by the production and exportation of crude oil. Given the fluctuation of international oil prices as well as the fluctuation of Nigeria's economic growth, the economy has lost many of its chances to come out of its state of low level of development, notwithstanding the huge natural and human resources endowment (Adams, Alumbugu & Abayomi, 2015). The country's heavy dependence on the production and sale of crude oil has made the economy vulnerable to international oil price volatility, which can result in the reduction of public resources, thereby creating negative spillover effects on other areas of the economy. The mining sectors of an economy are usually characterized by huge capital-based structures, weak interconnections with other sectors of the economy, and contrary to the norm, they are usually incapable of generating adequate employment. Series of external shocks have motivated Nigerian policy makers and other government authorities to embark on inquiries and find out how to solve the problem of disequilibrium in the economy and proffer strategies for sustaining economic growth (Odeleye & Olunkwa, 2016). Thus, the problem facing the Nigerian economy is not only the problem of economic growth but economic growth that is sustainable.

Policy makers consider the expected trends of oil revenue in the preparation of national budgets in Nigeria. Development planners consider the trends of oil revenue in economic development planning for Nigeria. The volume of GDP growth for the economy usually correlates with the financial performance of the oil sector. The same indispensable oil sector cannot provide employment for a reasonable portion of Nigeria's labour force. The motivational questions following this structural economic problem of Nigeria are - how can the economy achieve sustainable economic growth and development, bearing in mind that employment and economic growth are critical indicators of macroeconomic performance and the standard of living in the world? What is the sustainable approach for Nigeria's employment status to improve? Is there any other means of achieving sustainability for Nigeria other than to diversify economic production? Is it possible for the diversification of production to effectively impact on the people of Nigeria if the diversification of production is not targeted towards increasing employment and income? Has Nigeria's approach towards diversifying

the economy been to increase employment and economic growth? It became imperative for the researcher to examine the impact of economic diversification on employment and economic growth in Nigeria; a potential hunch to be subjected to empirical investigation.

According to Haller (2012), the economic growth of a country is the increase in the value of the country's national output that is estimated by increase in the gross domestic product. It is usually concerned with higher levels of production – a rise in output production without a corresponding increase in the inputs of production such as labour, human capital, physical capital and natural assets. This definition imply that economic growth involves structural transformation. Essential pivot is how Nigeria can achieve inclusive and sustainable economic growth because inclusive and sustainable economic growth are important measures of economic welfare and economic prosperity and because Nigeria needs to update its growth and development status both domestically and globally. Inclusive economic growth is a situation whereby everyone is encouraged to play a role in the growth process and also obtain some gains from the growth of the economy. In order to sustain the growth of an economy over the long-run, the growth must be wide-reaching throughout all the sectors and a reasonable portion of the country's labour force must be involved. Inclusive economic growth is an economic concept, which involves equity, the equality of opportunity among the people in a country; protection in the markets, alongside improvements in the structure of employment is one important attribute of any successful strategy of growth. This implies that equal opportunity is given to individuals and corporate entities in terms of resource availability, getting the unrestricted access to all markets and business regulations that are impartial (Agarwal, 2024). Sustainable economic growth is the economic growth that is achieved by the economy's present generation without trading-off the possibility of the future generation to achieve economic growth.

It is the necessity of the inclusiveness of economic growth as well as the sustainability of economic growth that propels the motivation for the diversification of economic production in the economy to enable the growth of income and equitable distribution of income during short-run as well as the long-run. According to Anyaechie and Areji (2015), economic diversification has the propensity to secure the basic requirement for sustainable development, which involves securing the basic needs of the poor, including job provision, food, good health, clothing and shelter by creating many avenues of economic

activity, which accommodate broad spectrum of people.

Employment can also be defined from a people-centric perspective. In this case, an individual is considered to be employed, underemployed or unemployed, rather than focusing on a particular job as the unit of analysis. Consequently, the employed was taken to comprise all persons who worked for pay or profit for at least one hour within the period under consideration, including the number of people who are temporarily absent from their jobs (International Labour Organization, 2018). This implies that employment is the engagement of people in an economic activity either for pay or for profit. According to Sodipe and Ogunrinola (2011), there is desire to increase the level of decent and productive employment in every country, and every country's macroeconomic policies are geared towards poverty reduction. Despite its importance, the execution of policies on the creation of employment has not yielded desired impact because there is a great gap between the jobs available in developing countries and the number of people actively looking for jobs in developing countries. This problem is typical of the Nigerian economy.

A fundamental macroeconomic objective for Nigeria is to engage in the diversification of the economy away from crude oil production and trade in order to achieve sustainable economic growth and development. Crude oil has been the major source of funding for the execution of economic development projects; budgetary planning and implementation depend on the revenue from oil trade, notwithstanding heavy fluctuations in oil price. It is awesome that as a country, there is a good foundation stone for funding growth and development plans. We envision that through economic diversification, oil funds can lead to sustainable growth and development. Nigeria needs to consolidate the productive development of the various sectors of the economy.

This empirical inquiry was carried out, to unveil the macroeconomic phenomenon, which could help to ensure that Nigeria will not be left behind in the global quest for sustainable economic growth and development. Economic diversification is a growth and development phenomenon; it is the process of moving an economy from a single source of income to multiple sources of income. In the case of Nigeria, it is the process of developing and expanding the oil and the non-oil sectors of the economy. According to the World Bank Group (2019), diversification is a policy objective for sustainable economic growth and it involves structural transformation characterized by increasing production, sustained economic growth and a higher level of economic development; structural transformation enables the diversification of various sources of

production and employment, foreign trade, income and expenditure through many dimensions; what indicates structural transformation is the declining share of agriculture in economic production and job creation, the movement of workers from low average productivity sectors to high average productivity sectors and increase in productive efficiency. This implies that diversification has some economic growth nexus. Being motivated by the quest for Nigeria to achieve sustainable economic growth and development, this study embarked on the positive inquiry to examine impact of economic diversification on employment and economic growth in Nigeria.

## 2. Literature Review

This section explored the extent of the work that has been done on the topic to provide a comprehensive understanding of the theoretical and empirical foundation of this research and to establish the existing gap in literature. It started with the presentation of the basic theories followed by some relevant empirical literature.

### 2.1 Basic Theories

The basic theories for this study are the Keynesian theory of employment, which demonstrated how the need for increase in economic production enhances employment and income in an economy. The Solow growth theory, provides an intuitive and theory-based knowledge on the interconnection that exists between the diversification of production and the growth of an economy. The Markowitz theory of diversification shows that diversification maximizes expected business returns and minimizes business risks.

**The Keynesian Theory of Employment**

Keynes's employment theory was postulated by John Maynard Keynes in 1936 and is anchored on effective demand. In this theory, the fundamental variable for economic performance in an economy is employment. The theory states that a country's magnitude of employment depends on the extent of effective demand. In Keynes' theory, it is effective demand that dictates what to produce and in what quantity, so it greatly determines output production. Effective demand in this context refers to the readiness and the capacity of consumers and investors to pay for commodities.

Keynes employment theory assumed that there is short period of depression, diminishing returns, Laissez fair economy, a closed economy and static analysis. The strengths of the Keynesian theory of employment is based on the fact that fiscal policies should be employed to stimulate aggregate demand, given that increased government spending on social infrastructure, reduction of business taxes and job programmes could raise employment level in the economy. Keynes employment theory is

relevant to this study because it demonstrated how the need for increase in economic production brings about a rise in employment level as well as income in an economy. This is because the theory assert that employment depends on output level such that higher volume of output implies higher volume of employment. The theory therefore consolidated the essence of this study's inquiry - the examination of the impact of the diversification of production on employment and economic growth in Nigeria.

**The Markowitz Theory of Diversification**

The theory of diversification was postulated by Harry Markowitz in 1952. Markowitz theory of diversification states that an investment portfolio should be diversified so as to maximize expected returns (profit) accruing to investment, while minimizing the expected risks of an investment portfolio. Markowitz theory of diversification explained how expansion in the range of available products by entrepreneurs reduces expected business risks and maximizes expected income. Markowitz's theory has been practically employed by people in the services sector, agricultural sector and industrial sector.

The strengths of the Markowitz theory of diversification lies on the fact that the theory is a sophisticated approach to decision making in investment or production and it enables investors or producers to categorize, calculate and control both the type and quantity of the risks and returns expected from an investment or production. Essential attribute of the Markowitz theory is its method of quantifying the relationship between risks and returns from a business and the assumption that every entrepreneur must be paid for taking risks (Iyiola, Munirat & Nwufo, 2012). The Markowitz diversification is of great relevance to this study because the theory provides an in-depth, fundamental understanding of economic diversification – how expansion in the range of available products by entrepreneurs reduces expected business risks and maximizes expected income. It opens our brains to inquiries on economic diversification in the macroeconomy; it is a microeconomic theory that informed the macroeconomy.

**2.2 Empirical Literature**

This study's empirical literature was designed to guide the research to investigate the impact which economic diversification had on economic growth in Nigeria. For instance, Adenugba and Dipo (2013) investigated the effect of economic diversification on economic growth in Nigeria from 1981 to 2010, using ordinary least squares regression model. The data used for the study were GDP, exchange rate and non-oil exports. The findings showed that diversification does not significantly cause growth in Nigeria; that strategies employed for diversification in

Nigeria were not effective. The research also showed that the economy of Nigeria was still far from being diversified from oil and that same oil sector might continue to remain the only relevant sector in Nigeria, given the structure and the situation of the economy at the time of their study.

Onodugo, Ikpe and Anowor (2013) examined how economic diversification affect economic growth in Nigeria between 1981 and 2012, using the conventional long run regression model. Data used for the study were GDP, gross fixed capital formation, oil exports, non-oil exports, imports as well as trade openness. Findings revealed a very weak and infinitesimal impact of diversification in influencing the rate of change of the level of economic growth in Nigeria. The study stated that the shocking results invalidated and dismissed claims attributing economic growth in Nigeria to contributions from economic diversification. Esu and Udonwa (2015) examined the degree to which Nigeria could obtain benefits by diversifying production. The study used time series data from 1980 to 2011 which was estimated using the error correction model (ECM). The data used were real GDP growth rate, oil trade, labour-stock, non-oil trade, stock of capital, oil oriented FDI, non-oil oriented FDI, Nigeria's openness to trade, the rate of inflation and the rate of exchange. The result revealed that both in the short term and the long term, economic diversification had a significant impact on Nigeria's economic growth.

Nwanne (2015) investigated the relationship between diversification and economic growth in Nigeria from 1983 to 2014, using the OLS Method. Data used were on GDP, agricultural export, manufacturing export and solid minerals export. The research revealed a significant impact of diversification on economic growth in Nigeria. On the other hand, Odeleye and Olunkwa (2016) investigated the relationship between diversification and economic growth in Nigeria from 1981 to 2015. Data were analysed using ordinary least square (OLS) method and error correction mechanism (ECM), and the result revealed that diversification had a negative effect on Nigeria's economic growth. Okezie and Azubike (2016) investigated the impact of non-oil revenue on government revenue and Nigeria's economic growth from 1980 to 2014. The result showed that there was no significant impact of non-oil revenue on economic growth.

Mobosi, Okafor and Asoh (2017) examined the how diversification policy in the Nigerian industrial sector affect output growth in Nigeria from 1970 to 2017, using time series data. Data used were government diversification, GDP, per capita output growth, human capital and domestic credit.

The study used Error Correction technique alongside trend analysis. The findings of the study revealed that government diversification, human capital and domestic credit had significant impact on the GDP and output growth per capita. The study by Duru and Ehidiamhen (2018) examined the effect of economic diversification on economic growth in Nigeria from 1980 to 2016, using ARDL bound testing approach to cointegration. The data used were exports, investment, growth rate of exports, openness to trade and economic growth. The result showed that diversification had a positive impact on Nigeria's growth and the impact was significant; that Nigeria's openness to trade did not exert significant effect on economic growth.

Ganiyu (2018) evaluated the impact of diversification on economic growth and government revenue. The study used secondary data. Using the ordinary least square method, the study found that there was a significant impact of diversification on economic growth. Also, that there was significant impact of diversification on total government revenue. Oyelami and Alege (2018) studied the effects of economic diversification on the performance of Nigeria's economy from 1965 to 2015. The model used for the study was the bound test of ARDL, to find out whether there was correlation in the behaviour of diversification with selected indicators. Variables used were Theil index of diversification, investment, the rate of exchange and gross domestic product. The study further examined the impact of extensive and intensive trade diversification on economic growth, both in the short term and the long term. The findings indicated co-integration between exchange rate, economic growth and diversification.

Doki and Tyokohol (2019) examined how economic growth is affected by diversification in Nigeria from 1981 to 2016 using the Error Correction Model (ECM). The study found that diversification had insignificant impact on economic growth in Nigeria in the long and the short run due to the low level of diversity of export. On the other hand, Nwosa, Tosin and Ikechukwu (2019) examined the nexus between economic diversification and economic growth in Nigeria, from 1962 to 2016. The study utilized Auto-regressive Distributed Lag (ARDL) technique. Variables used were GDP, inflation, diversification and exchange rate. The result of this study showed that diversification had positive but insignificant influence on economic growth in Nigeria. Tonuchi and Onyebuchi (2019) investigated how economic diversification affected economic growth in Nigeria from 1981 to 2018. Using the auto regressive distributed lag model, the findings showed that diversification had positive significant impact

on Nigerian economic growth. But, Ajayi (2020) examined the impact of economic diversification on economic growth in Nigeria from 1999 to 2019 using vector error correction model. The study found that diversification through manufacturing had significant impact on economic growth, while diversification through agriculture did not significantly impact on economic growth.

Owan, Ndibe and Anyanwu (2020) investigated the impact of economic diversification on Nigeria's economic growth, between 1981 and 2016. The research used OLS model and found a significant impact of economic diversification on the rate of exchange and economic growth in Nigeria. Moreover, investment did not exert significant impact on economic growth in Nigeria during the period. Duhu (2021) examined the effect of economic diversification on Nigeria's economic growth. The variables used for the work were Nigeria's openness to trade, gross fixed capital formation, Theil index, per capita GDP and exchange rate. The selected period for the study was from 1980 to 2017, using the ARDL model, findings showed that diversification did not exert significant impact on Nigeria's economic growth, though the impact was positive. Ozdeser, Usman and Shuaibu (2021) investigated the effect of economic diversification on Nigeria's economic growth, using structural VAR analysis, from 1986 to 2018. Data used for the study were gross domestic product per capita, agricultural output, output of the services sector, received official development assistance, tourism and remittances inflow received. Results indicated that the impact of diversification on Nigeria's economic growth was significant. Afrogha and Afrogha (2022) studied the implications of economic diversification in Nigeria from 1986 to 2016. Using the OLS model. The result showed that diversification to agriculture had significant impact on economic growth, while diversification to manufacturing exerted insignificant impact on economic growth of Nigeria. Ejem (2022) studied the impact of diversifying Nigeria's revenue base on economic growth from 1981 to 2020, using ordinary least squares regression technique. The study found that economic diversification did not have significant impact on the economic growth of Nigeria.

The empirical literature on the impact of economic diversification on the economic growth of Nigeria came with a dichotomy and there was no consensus whether the impact was significant or not. There was no empirical study found by the researcher during this research, specifically on the impact of economic diversification on employment in Nigeria. Thus, this inquiry sought to discover the impact which economic diversification had on employment in Nigeria.

## 3. Research Methods

### 3.1.1 Theoretical Framework for the Employment Model

The theoretical framework for the employment model in this study is based on the Keynesian theory of employment, which states that a country's magnitude of employment depends on the extent of effective demand. The aggregate effective demand is a function of the economy's aggregate expenditure, comprising of consumption expenditure, investment expenditure, government expenditure and expenditure on net imports. Any alteration in one of these components of aggregate demand exerts some influence on the aggregate output of the economy. For example, an increase in consumption expenditure, ceteris paribus, will increase income, increase output production as well as employment to meet up with increased production.

Given an economy, consisting of the households, the firms, the government and foreign trade factors, such that effective demand in the economy is a summation of consumption expenditures, investment expenditures, government expenditures and expenditures on net imports. This is mathematically stated as:

$$D = C + I + G + N \quad (3.1)$$

Where D represents effective demand, C represents consumption expenditure, I represent investment expenditure, G represents government expenditures and N represents expenditures on net imports. This equation is known as aggregate demand function.

Suppose that the total effective demand comprising all the expenditures in the economy represents total output (Y), we have;

$$Y = C + I + G + N \quad (3.2)$$

The aggregate demand function shows that effective demand includes demand for all the commodities produced at various levels of employment in the process of production in an economy, where the total output (Y) refers to total income, total employment is a function of aggregate output (income) in the economy, so that we have the following equation -

$$EMP = f(Y) \quad (3.3)$$

Where EMP represents total employment in the economy. Thus, all expenditures in the economy are the consequences of the various levels of employment in the economy.

Suppose that economic production in the economy is diversified in order to increase employment and income, this permits the study to include the variable for economic diversification in the employment model. Thus, we have -

$$EMP = f(Y, EDIV) \quad (3.4)$$

Where EDIV represents economic diversification. This implies that total employment is a function of the diversification of production and income. And income in the economy is truly represented by the real GDP; this -

$$EMP = EDIV + RGDP$$

This econometric form of the equation is stated as:

$$EMP_t = \delta_0 + EDIV_t + RGDP_t + \varepsilon_i \quad (3.5)$$

Where RGDP represents the real GDP; $\delta_0$ is the constant factor, t is the time factor and $\varepsilon_i$ is the error term.

Hence, the employment model in this study states that the level of employment depends on the extent of the diversification of economic production and the real gross domestic product of the country. Ultimately, the employment model stated that ceteris paribus, employment in Nigeria is a function of the diversification of production and output (income).

### 3.1.2 Theoretical Framework for the Economic Growth Model

The theoretical framework for the economic growth model is based on Romer's version of the new growth theory, established in 1990. Romer's new growth theory states that economic growth depends on the accumulation of capital and ideas, being motivated by people 's personal needs, personal wants and the pursuit of profit, that transformation in the state of technology is the outcome of the hard-work of entrepreneurs and researchers who are motivated by financial benefits. The theory identified the AK production function. In the Romer's idea production function, there is AK structure in which A represents knowledge and K represents capital.

$A_t$ = the flow of ideas at time (t) and

$$A_t = dA_t/d_t. \quad (3.6)$$

Romer's answer to the question "what is the source of exponential economic growth?" was explained with the AK linearity production function:

$$Y_t = AK\sigma_t \quad (3.7)$$

The AK linearity function states that output is the outcome of a production function, which has increasing returns to ideas and objects together. Where Y represents output, A represents ideas and K represents objects (human capital), σ is a measure of the magnitude of increasing returns to scale and t represents time. The function of the new ideas of production is to advance the level of production technology and activate the consequent spillovers, thereby raising the capacity of the economy to produce. Let us take economic diversification to represent new ideas A and employment to reflect human capital K. This is because diversification of production comes from "new ideas" and the possibility/availability of required labour (for employers and the self-employed) depend on nature of human capital. We obtain an implied equation showing that employment is a function of economic diversification. This is given as:

$$Y = F(EDIV, EMP) \quad (3.8)$$

Where EDIV = economic diversification, EMP = employment, Y = output and F = function.

Econometrically, this gives-

$$Y_t = \alpha + EDIV_t + EMP_t + \varepsilon_t \quad (3.9)$$

Real GDP was taken to represent output in the model, which is economic growth. Economic growth is the most important macroeconomic fundamental and it is vital in the study of economic diversification, as long as economic diversification is a policy intervention variable, intended to generate economic growth.

Adding real GDP, we get:

$$RGDP_t = \alpha + EDIV_t + EMP_t + \varepsilon_t \quad (3.10)$$

Where RGDP represents real GDP.

This is the framework designed for the economic growth model of the study, and it has a ring of truth; that output expansion (economic growth) takes place in an economy as a result of the diversification of output production, which is the outcome of entrepreneurial research, motivated to invent new ideas in production in order to earn profits. Thus, the model states that ceteris paribus, the economic growth of Nigeria is a function the diversification of production, which is the outcome of the proliferation of productive ideas by researchers and entrepreneurs who are motivated by economic benefits. The theoretical framework for the economic growth model comprehends the theoretical framework for the employment model. This reveals the strong interrelations among the variables under examination. Thus, the major objectives of the study have been captured by the theoretical frameworks.

### 3.2 Model Specification

The empirical procedure employed in this study to model and measure phenomena were employed to yield reliable results. The study used the simultaneous equation model in modelling employment and economic growth with respect to economic diversification for Nigeria. Simultaneous equation modelling assumes that the variables under study are reciprocally causal and this allows for multiple dependent variables. Thus, simultaneous equation modelling was employed in this research because the study involves many dependent variables. The two stage least squares estimator was used to measure the model because it is an efficient, unbiased and robust estimator and it helps to handle the problem of endogeneity.

According to Gujarati and Porter (2009), a simultaneous equation model is in the form:

$$Z1_t = \beta 12Z2_t + \beta 13Z3_t + ... + \beta 1MZM_t + \gamma 11A1_t + \gamma 12A2_t + ... + z1KAK_t + \mu 1_t$$

$$Z2_t = \beta 21Z1_t + \beta 23Z3_t + ... + \beta 2MZM_t + \gamma 21A1_t + \gamma 22A2_t + ... + z2KAK_t + \mu 2_t$$

$$Z3_t = \beta 31Z1_t + \beta 32Z3_t + ... + \beta 3MZM_t + \gamma 31A1_t + \gamma 33\ A2_t + ... + z3KAK_t + \mu 3_t$$

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$$ZM_t = \beta M1Z1_t + \beta M2Z2_t + ... + \beta M_t{-}1ZM_t{-}1 + \gamma M1A1_t + \gamma M2A2_t + ... + \gamma MKAK_t + \mu\, m_t \quad (3.11)$$

This is a typical model used to determine endogenous variables with respect to predetermined variables and disturbance terms. This gives rise to a simultaneous equation model in the form;

$$Z_t = \alpha + \beta Z_t + \beta Z_{t-1} + \beta A_t + \beta A_{t-1} + \varepsilon_t \quad (3.12)$$

Where Z = dependent variable, α = constant, A = explanatory variables, β = coefficient of the explanatory variables, t = time, t−1 = time lag, A = dummy variables and ε = error term. In modelling for this study, the researcher considered the economy of Nigeria; an economy where various economic production take place; there is domestic and foreign trade; there is employment of labour and there is industry expansion. The variables employed for the study were employment (total employment), real GDP, economic diversification, agricultural employment, industrial employment, services sector employment, inflation, foreign direct investment, degree of trade openness and human capital. Following Sodipe and Ogunrinola (2011), the mathematical function is hereby adopted in the form:

EMP = (EDIV, RGDP, AGRICEMP, INDEMP, SERVEMP, HUMCA) (3.13)

RGDP = (EDIV, EMP, INF, FDI, DTOP, HUMCA) (3.14)

Where EDIV = Economic diversification, EMP = Employment, RGDP = Real gross domestic product, AGRICEMP = Agricultural employment, INDEMP = Industrial employment, SERVEMP = Employment in the services sector, INF = Inflation, DTOP = Degree of trade openness, HUMCA = Human capital and FDI = Foreign direct investment.

Note that logarithmic transformation of the data was undertaken. Thus, LN represents natural log. Only data on inflation did not undergo logarithmic transformation. Logarithmic transformation normalizes data and improves linearity between dependent and independent variables.

**Modelling for Employment with Respect to Economic Diversification in Nigeria**

Following Sodipe and Ogunrinola (2011), we establish simultaneous equation model for employment in Nigeria. Note that the fundamental accompanying variables in the model were adopted as endogenous such that in modeling for employment in Nigeria, the

study obtained 4 exogenous variables and 6 endogenous variables.

LNEMP = (LNEDIV, LNRGDP, LNAGRICEMP, LNINDEMP, LNSERVEMP, LNHUMCA) (3.15).

LNAGRICEMP = (LNEDIV, LNRGDP, LNINDEMP, LNSERVEMP, LNHUMCA) (3.16)

LNINDEMP = (LNEDIV, LNRGDP, LNAGRICEMP, LNSERVEMP, LNHUMCA) (3.17)

LNSERVEMP = (LNEDIV, LNRGDP, LNAGRICEMP, LNINDEMP, LNHUMCA) (3.18)

**Modelling for Economic Growth with Respect to Economic Diversification in Nigeria**

Following Ford, Sen, and Wei (2010), we establish simultaneous equation model for economic growth in Nigeria. Note that the core macroeconomic variables in the model are adopted as endogenous such that in modeling for economic growth in Nigeria, the study obtained 5 exogenous variables and 6 endogenous variables.

LNRGDP = (LNEDIV, LNEMP, INF, LNFDI, LNDTOP, LNHUMCA) (3.19)

INF = (LNEDIV, LNRGDP, LNEMP, LNFDI, LNDTOP, LNHUMCA) (3.20)

LNFDI = (LNEDIV, LNRGDP, LNEMP, INF, LNDTOP, LNHUMCA) (3.21)

LNDTOP = (LNEDIV, LNRGDP, LNEMP, INF, LNFDI, LNHUMCA) (3.22)

LNHUMCA = (LNEDIV, LNRGDP, LNEMP, INF, LNFDI, LNDTOP) (3.23)

### 3.3 Estimation Techniques/Procedures

Following Udoumoh, Enebi, Olubo-ojo and Subeno (2016), the technique of two stage least squares was employed to evaluate the study's simultaneous equation models. Hence, the reduced form equations were estimated and used for the analysis.

## 4. Empirical Results

**Table 4.1 Summary of Augmented Dickey Fuller (Unit Root Test) at 5%**

| **Level** | | | **First Difference** | |
|---|---|---|---|---|
| **Variable** | T Statistics | Critical T | T Statistics | Critical T |
| **LNEDIV** | -2.004477 | -2.919952 | -5.459586 | -2.921175 |
| **LNEMP** | -0.123257 | -2.919952 | -5.460636 | -2.921175 |
| **LNRGDP** | -3.677744 | -2.918778 | -8.554103 | -2.919952 |
| **LNAGRICEMP** | 0.824470 | -2.919952 | -5.426699 | -2.919952 |

| | | | | |
|---|---|---|---|---|
| **LNINDEMP** | -1.610269 | -2.918778 | -7.283065 | -2.919952 |
| **LNSERVEMP** | 0.541250 | -2.918778 | -6.063788 | -2.919952 |
| **INF** | -4.282031 | -2.919952 | -7.688667 | -2.921175 |
| **LNFDI** | -1.552361 | -2.919952 | -5.623941 | -2.921175 |
| **LNDTOP** | -1.628114 | -2.919952 | -8.427943 | -2.919952 |
| **LNHUMCA** | -2.605092 | -2.919952 | -4.144604 | -2.919952 |

**Source: Researcher's computation (2024).**

From the ADF test results in Table 4.1, only real GDP and inflation exhibited stationarity at level, while all the other variables including economic diversification, real GDP, employment, agricultural employment, industrial employment, employment in the services sector, inflation, FDI, Nigeria's openness to trade and human capital were stationary at first difference. Thus the null hypothesis of no unit root among the indicators is accepted. The result implies that the data set employed for the study were stationary.

**Table 4.2 Johansen Cointegration Test Results**

| Null Hypothesis | Alternative Hypothesis | Trace Statistics | 95% critical value | Max-Eigen statistics | 95% Critical Value |
|---|---|---|---|---|---|
| **r = o** | r = 1 | 425.7761 | 273.1889 | 112.2320 | 68.81206 |
| **r ≤ 1** | r = 2 | 313.5441 | 228.2979 | 82.87632 | 62.75215 |
| **r ≤ 2** | r = 3 | 230.6678 | 187.4701 | 70.72622 | 56.70519 |
| **r ≤ 3** | r = 4 | 159.9416 | 150.5585 | 43.80239 | 50.59985 |
| **r ≤ 4** | r = 5 | 116.1392 | 117.7082 | 33.47241 | 44.49720 |
| **r ≤ 5** | r = 6 | 82.66678 | 88.80380 | 29.52909 | 38.33101 |
| **r ≤ 6** | r = 7 | 53.13769 | 63.87610 | 19.44427 | 32.11832 |
| **r ≤ 7** | r = 8 | 33.69342 | 42.91525 | 17.15744 | 25.82321 |
| **r ≤ 8** | r = 9 | 16.53598 | 25.87211 | 11.96741 | 19.38704 |
| **r ≤ 9** | r = 10 | 4.568572 | 12.51798 | 4.568572 | 12.51798 |

**Source: Researcher's computation (2024).**

For the cointegration analysis, the study employed Johansen Cointegration test. The trace statistic dictated 4 cointegrating vectors at a 5% level of significance, while the Maximum Eigen value dictated 3 cointegrating vectors at a 5% level of significance. Thus, the alternative hypothesis of long-run relationship is hereby accepted. There was long run relationship among the data employed for this research.

**Presentation of Regression Results**

This section presented the results of two-stage least squares regression. The findings presented are the regression estimates of nine simultaneous equation models, showing the empirical impacts of economic diversification on employment (total employment) and Nigeria's economic growth; it provided a sectoral analysis of the impact that economic diversification had on employment in Nigerian agricultural sector, industrial sector and services sector; it also presented the impact that economic diversification had on other critical macroeconomic fundamentals, which included inflation, FDI, Nigeria's openness to trade and human capital.

**Table 4.3 Two Stage Least Squares (2SLS) Estimates (95% Level of Confidence)**

| | LNEMP | LNRGDP | LNAGRICEMP | LNINDEMP | LNSERVEMP | INF | LNFDI | LNDTOP | LNHUMCA |
|---|---|---|---|---|---|---|---|---|---|
| **LNEDIV** | 0.003565 | 0.274554 | 0.007864 | 0.001172 | 0.006918 | -4.128383 | 0.191411 | 0.010980 | -0.132334 |
| **C** | -2.852745 | 9.595464 | 9.563624 | 7.026213 | 8.703095 | 6.777698 | 0.619535 | 0.828306 | -2.586800 |
| **t. Statistic** | 2.325649 | 1.806709 | 3.015618 | 0.458024 | 2.968315 | -0.751255 | 2.184352 | 0.781443 | -3.264345 |
| **P-Value** | 0.0244 | 0.0772 | 0.0041 | 0.6490 | 0.0047 | 0.4562 | 0.0340 | 0.4385 | 0.0020 |
| **Std. Error** | 0.001533 | 0.151964 | 0.002608 | 0.002558 | 0.002331 | 5.495317 | 0.087628 | 0.014051 | 0.040539 |
| **R-squared** | 0.980082 | 0.539018 | 0.996730 | 0.862692 | 0.997336 | 0.059993 | 0.892573 | 0.979132 | 0.983962 |
| **F-statistic** | 462.5260 | 10.99127 | 3657.745 | 75.39447 | 4493.282 | 0.599925 | 78.10110 | 441.0522 | 576.7262 |
| **Prob. (F-stat.)** | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.700141 | 0.000000 | 0.000000 | 0.000000 |
| **Mean dependent** | 3.980497 | 9.909668 | 3.805796 | 2.471046 | 3.753051 | 18.07233 | 2.177050 | 0.881529 | 1.644855 |
| **S.D. dependent** | 0.024659 | 0.555428 | 0.114107 | 0.015874 | 0.112711 | 13.68257 | 0.673337 | 0.234927 | 0.850802 |

**Source: Researcher's computation (2024)**

To estimate the model, the study employed 2SLS estimator. The estimates were obtained at a 95% level of confidence. It unveiled the behaviour of employment (total employment) and economic growth with respect to economic diversification in Nigeria. The result provided a sectoral analysis for the impacts of economic diversification on agricultural employment, industrial employment and employment in the services sector of Nigeria. The research further evaluated the impact of diversification on the accompanying variables for the study (inflation, FDI, Nigeria's openness to trade and human capital). It was revealed that the P-value for employment, that is, total employment (LNEMP) was 0.0244. This implied that economic diversification had significant impact on employment in Nigeria. The estimate revealed that the P-value for real GDP (LNRGDP) was 0.0772. This implied that economic diversification did not have significant impact on Nigeria's economic growth.

Agricultural employment (LNAGRICEMP) and employment in the services sector

(LNSERVEMP) came out with P-values of 0.0041 and 0.0047 respectively, showing a significant impact of economic diversification on agricultural employment and employment in the services industry in Nigeria. However, industrial employment (LNSERVEMP) had a P-value of 0.6490, which meant that economic diversification had insignificant impact on industrial employment in Nigeria.

Research findings further showed that inflation (INF) and the degree of trade openness (LNDTOP) had P-values of 0.4562 and 0.4385, respectively, implying that economic diversification did not have significant impact on inflation and Nigeria's openness to global trade. Moreover, research findings showed that economic diversification had significant impact on foreign direct investment (LNFDI) and human capital (LNHUMCA) in Nigeria with P-values of 0.0340 and 0.0020 respectively. Diversification exerted a negative impact on inflation. It exerted a positive impact on human capital.

The results showed positive regression coefficients for LNEMP (total employment), LNRGDP (real GDP), LNAGRICEMP (agricultural employment), LNINDEMP (industrial employment), LNSERVEMP (employment in the services sector), LNFDI (foreign direct investment) and LNDTOP (degree of trade openness) at 0.003565, 0.274554, 0.007864, 0.001172, 0.006918, 0.191411 and 0.010980, respectively. This imply that a 1% increase in economic diversification will lead to approximately 0.4% increase in total employment in Nigeria, 27% increase in economic growth in Nigeria, 0.8% increase in agricultural employment in Nigeria, 0.1% increase in industrial employment in Nigeria, 0.7% increase in employment in the Nigerian services sector, 19% increase in foreign direct investment and 1.1% increase in Nigeria's openness to international trade. However, the results showed that a one percent increase in economic diversification will lead to a 413% decrease in inflation, having a negative regression coefficient of -4.128383.

The results of 2SLS estimates on the table showed the endogeneity level or direction of causality of the endogenous variables, comparing the F-statistic values and the coefficient of determination ($R^2$). From the result, it was revealed that LNEMP, LNRGDP, LNAGRICEMP. LNINDEMP, LNSERVEMP, LNFDI, LNDTOP and LNHUMCA were more endogenous than exogenous, having the R2 of 98%, 54%, 99.7%, 86%, 99.7%, 89%, 98% and 98%, with significant F-statistics of 462.5260, 10.99127, 3657.745, 75.39447, 4493.282, 78.10110, 441.0522 and 576.7262, respectively. However, INF is less endogenous as it has $R^2$ of about 6%.

Results of diagnostic tests indicate that the models were well specified, meeting the conditions of all the tested statistics. The $R^2$ value of 90.3% on the average showing that the whole model has good fit. Except for inflation, the F-statistic values suggested that there was significant relationship between the respective indicators. Hence, the analysis based on the estimates of the model was reliable and should be trusted.

The impact of economic diversification on employment in Nigeria was infinitesimal in the level of its contribution to employment in Nigeria; a 1% increase in economic diversification will lead to 0.4% increase in employment. The responsiveness of total employment to economic diversification was below expectation and Nigeria needs to raise its employment status. Economic diversification positively reflects on economic growth but the impact on economic growth is yet to become significant and as such has not started yielding desired results. This is because there was inadequate structural industrial planning and structural industrial diversification; there was low level of diversity and diversification projects were not targeted towards employment.

## 5. Conclusion and Recommendations

This study evaluated the relationship between economic diversification and other macroeconomic variables using simultaneous equation models and 2SLS estimator. The research revealed that economic diversification had positive significant impact on employment, but insignificant positive impact on Nigeria's economic growth. It shows that the economy is on a promising track and that diversification could help Nigeria to achieve the global sustainable development goal number 12, which is to achieve sustainable production and consumption patterns. Economic diversification has the potential of increasing Nigeria's level of employment and achieving sustainable economic growth if Nigeria should intensify efforts to increase the magnitude of diversification so as to raise its impact on economic growth. If all the sectors of the economy are given greater attention with respect to diversification for employment, so that the diversification of production will ultimately increase employment and income in Nigeria.

Following this positive inquiry on the impact of economic diversification on employment and economic growth in Nigeria, the study proffered the following recommendations:

1. Diversification projects should be matched with employment targets. The government should adopt diversification for employment as a policy in Nigeria. This policy implies that for every economic development project in Nigeria, employment target must be stipulated. There should be national orientation on

the policy of diversification for employment in Nigeria, to motivate investors and entrepreneurs and adopt the policy as the corporate social responsibility of their private entities. Federal business license should be given only to companies with satisfactory indigenous employment targets. This will enable diversification projects to have greater impact on employment in Nigeria.

2. The magnitude of diversification should be intensified using the following diversification strategies/approaches: (i) global integration with economic development partners; (ii) government intervention into target specific markets; (iii) elemental reforms should be made to develop appropriate incentive frameworks that will smoothen the business and investment climate and reduce the costs of trade; (iv) effective policies should be made to support redistribution of resources to new activities and the job market; (v) Nigeria's channels to enlarged volume of production and trade activities, depicting its endowments, business' relative advantages, availability of skills and macroeconomic structure should be examined and considered in the course of implementation; (vi) Growth enhancing projects that are undertaken to increase output production should be modelled to generate more employment. Existing firms should be encouraged to increase job opportunities.
3. The federal government of Nigeria should establish a National Board for Economic Diversification (NBED), to specialize and concentrate on the modus operandi for economic diversification in Nigeria because economic diversification is a dynamic and long term initiative. This recommendation comes from the fact that after several years of attempts at diversifying the economy, the impact of diversification on economic growth remained insignificant.
4. Incentives for increase in agricultural production, processing and marketing should be provided, and agricultural diversification projects should be matched with employment targets so that increase in agricultural production will lead to increase in employment in Nigeria.
5. Greater attention should be given to industrial diversification with the objective of increasing employment level in Nigeria through industrial diversification projects. The economy should focus on structural industrialization – engaging in the expansion of production of goods/services for which Nigeria has the required human and material resources. Elemental reforms for structural industrialization that is sustainable, will help the country to

achieve economic diversification for industrial employment.

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