
Research Article

The Effect of Domestic Product and Population in Nigerian's Economy

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ABSTRACT: This study presents a broad analysis of the effects of population and domestic product on Nigeria's economy from 2003 – 2012. The aim of this work is to identify a regression model which could explain the impact of high Population of Nigerians on their economy. The result of the analysis revealed that the variables considered accounted for over 90% of the variation on the explanatory variable, indicating that the variables could be used to measure the economic status of Nigeria based on this study. The result of the analysis therefore calls for the attention of those in government to provide options which could help improve the economy at a high level. Furthermore, this research work could aid in predicting gross domestic product using these factors.

KEYWORDS: Economy, Gross Domestic Product, Nigeria, Oil, Regression

I. INTRODUCTION

The Nigeria's real Gross Domestic Product (GDP) for 2011 and 2012 was estimated at 5.09 per cent and 6.66 per cent respectively while the economy grew by 7.41 per cent in real terms in 2013[1]. It has been noted that the Economic growth of a nation is significantly dependent on the growth of its population.[2] Hence with the large size of Nigeria's population, it is expected that it will have a positive effect on its economy.

The petroleum industry in Nigeria is the largest industry and main generator of GDP in Nigeria since the British discovered oil in the Niger Delta in the late 1950s. Prior to the discovery of oil, Nigeria like many other African countries strongly rely on agricultural exports to other countries to service their economy. The contribution of agriculture to GDP, was 63 percent in 1960, it declined to 34 per cent in 1988, due to neglect of the agricultural sector. [3]. After nearly 50 years of search for oil in the state, Shell-BP discovered the oil at Oloibiri in the Niger Delta. Nigeria joined the rank of producers in 1958 when its first oil field came on stream producing 5100 barrels per day. The end of the Nigeria Civil War coincided with the rise in the world oil price; Nigeria was able to reap resistant riches from its oil production. Unlike most of the other OPEC countries, Nigeria is one of the few major oil-producing nations still capable of increasing its oil output and petroleum has been seen as a way of doubling Nigeria's revenue earning.

The rise in population growth and GDP is significantly higher in the period since World War II than it was in the period prior to that time. This is the period during which growth in oil consumption had a significant impact on the economy. Oil greatly improved transportation and also enabled much greater agricultural output. An indirect result was more world trade which enabled production of goods needing inputs around the world such as computers.

The dominant role of Shell in the Nigerian oil industry continued for many years until Nigeria's membership of the Organisation of Petroleum Exporting Countries (OPEC) in 1971, after which the country began to take a firmer control of its oil and gas resources, in line with the practice of the other members of OPEC. The Nigeria's total daily oil production currently stands at about 2.4 million barrels of oil per day. Nigeria was the fifth largest producer in OPEC in 1986 and estimated to have reserves of sixteen billion barrels, 2.23% of the world reserve. As mentioned earlier, the population of Nigeria is over 160 million people, the largest national population on the African Continent. With this population, Nigeria is obviously the largest market in sub-Saharan Africa with reasonably skilled and potential manpower for efficient and effective management of investment projects within the country. The population is made up of about 434 pure ethnic groups with 395 languages spoken. Three of the ethnic groups: Hausa, Igbo and Yoruba are major groups and they constitute 40 percent of the population. The other large groups are Tiv, Ibibio, Kanuri, Ijaw, Nupe, Gwari, Igala, Jukun, Idoma, Fulani, Edo and Urhobo.

The following population indices are of relevance: high growth rate of 3.2% per annum, large work force – working age group 15 – 59 years are 53% of the population.

Nigeria's economy is struggling to leverage the country's vast wealth in fossil fuels in order to displace the crushing poverty that affects about 57 per cent of its population. Economists refer to the co-existence of vast natural resources, wealth and extreme personal poverty in developing countries like Nigeria as the "resource curse". [4], examines that there is a relationship between exports and economic growth in Nigeria. Using Johansens multivariate co-integration technique, his result shows that there is stationary relationship between exports and gross domestic product (GDP). Since Nigeria exports oil, it is expected that the activity will impact positively on its economy. [5] Viewed that an increase in foreign demand for domestic exportable products can cause an overall growth in output via an increase employment (population) and income gross domestic product in the exportable sectors.

[6] Investigated the impact of income generated from oil exports on economic growth in Iran. Using Cobb-Douglas production function, oil exports contributes to real income through real capital accumulation.

The purpose of this study is to examine the relationship existing between the GDP given the large population of Nigeria and the volume of oil produced.

II. MATERIALS AND METHODS

The study relied on current Literature and online publications to provide a good understanding of how a nation's domestic product and population can affect economic growth which is generally regarded as a necessary component of any development strategy. Harrod-Domar theory is used to explain economic growth which is the main essential feature of economic growth without a corresponding economic development. The theory shows that there is a positive relationship between saving and growth while there is a negative relationship between growth capital/output ratios. Growth can be mathematically expressed as $G = S/K$, where K incremental capital output, S the average propensity to save.

Also, Solow's theory of economic growth shows that growth is based on output, i.e. the combination of labour and capital. When input is doubled, then there will be increase in production too. It can be mathematically written as $y = af(l, K)$. The Solow growth model assumes that the marginal product of capital decreases with the amount of capital in the economy.

In the long-run, when an economy accumulates more capital, the capital stock (gk) approaches zero and the growth rate is determined by technical progress and growth in the labour force. While in the short-run, an economy that accumulates capital faster will enjoy a higher level of output.

Furthermore, the traditional neoclassical growth theory assumes that output growth occurs from three factors namely: first, increase in labour, quality and quantity i.e. through population growth and education. Second, increase in capital i.e. through saving and investment. Third is improvement in technology [7].

However, this study employs multiple linear regressions model in examining the relationship existing between GDP and economic growth given the Population of Nigeria.

Model Specification:

The model, for this study is stated as follows for:

$$\hat{Y}_j = b_0 + b_1 X_{1j} + b_2 X_{2j} \quad (1)$$

Where, $\hat{Y}_j$ = Estimated value of gross domestic product, X_{1j} = Population, X_{2j} = Barrels of oil $j = 1, 2, 3, 4, \dots, n$

In testing how well the estimating model fits the data we make use of these goodness of fit test.

- Coefficient of determination

$$\left(R^2 = \frac{SSR}{SST} \right) \quad (2)$$

- Adjusted coefficient of multiple determination

$$\left(R_{adj}^2 = \frac{1 - \frac{SSE}{n - (k + 1)}}{SSt / (n - 1)} \right) \quad (3)$$

Table 1 below shows the data collected from the United Nations World Bank data bank [8] The data is presented in years as shown below:

Table 1 Data on GDP, Population and Average daily Barrels of Oil from 2003 - 2012

Year	Gross Domestic product (Billion USD)	Population	Barrels of oil daily average (Thousands)
2003	67.656	132550146	2117.86
2004	87.845	135999250	2275.86
2005	112.248	139585891	2328.96
2006	145.43	143314909	2627.44
2007	166.451	147187353	2439.86
2008	208.065	151208080	2349.64
2009	169.481	155381020	2208.31
2010	229.508	159707780	2165.44
2011	245.682	164192925	2455.26
2012	262.597	168833776	2550.35

The data was collected for a period of ten years. As mentioned earlier, to examine the relationship existing between the GDP and the Population, regression analysis carried out gave the result as shown on table 2 below. In testing the hypothesis, the following hypothesis is states:

$H_0 : \beta_i = 0$, implying that the population and the crude oil have no effect on the GDP

$H_1 : \beta_i \neq 0$, implying that the population and the crude oil have effect on the GDP

Table 2: Regression Analysis: Gross Domestic Product, Population and Crude Oil.

Variables Entered/Removed (b)

Model	Variables Entered	Variables Removed	Method
1	Oil (in Barrel), Population(a)	.	Enter

a. All requested variables entered.

b. Dependent Variable: GDP

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.974(a)	.948	.934	17.26444

a. Predictors: (Constant), Oil (in Barrel), Population

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38378.733	2	19189.366	64.381	.000(a)
	Residual	2086.427	7	298.061		
	Total	40465.160	9			

a. Predictors: (Constant), Oil (in Barrel), Population

b. Dependent Variable: GDP

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients		t		Sig.	
		B	Std. Error	Beta		B	Std. Error		
1	(Constant)	-689.029	93.907			-7.337		.000	
	Population	5.17E-006	.000	.942		10.383		.000	
	Oil Barrel	.036	.036	.089		.980		.360	

a. Dependent Variable: GDP

From (1) above, the estimated model is given as:

$$GDP = 5.17E-006_{\text{population}} + 0.036_{\text{Barrels of oil}} \quad (4)$$

III. RESULTS / ANALYSIS

From table 2 above, the coefficient of multiple determination (R^2) value of 0.948 indicates that the explanatory variable accounted for 94.8% variation in the specified model. Therefore the variables used in the model based on this study could be said to have a good fit. In testing for the overall significance of the parameters used in the model at $\alpha = 0.05$, using analysis of variance (ANOVA), p-value of 0.000 indicates that H_0 is rejected, since p-value is less than α therefore the test is said to be highly significant. In determining whether each of the individual independent variable is significant, the t-test with p-value of 0.000 and 0.360 respectively show the variables are both significant. From the estimated model in (4) above, Crude oil as good as it has been proclaimed has just a little effect on gross domestic product; with value of 0.036. More effect lies on the population size.

IV. CONCLUSION.

This study shows that population and crude oil have effect on gross domestic product. Though population has more effect than crude oil. Therefore considering the high population of Nigerians and crude oil being produced in the country, it is expected that the economy will be robust hence the effect will be shown on the

standard of living of the masses. The issue of unemployment and poverty should not be heard of. The study therefore calls for attention of those in governance since the situation is actionable.

V. RECOMMENDATIONS

Based on the findings of this study, the following recommendations were suggested.

More private companies should participate in refining and production so that better equipped refineries can be built and the cost of refining crude oil will reduce thereby increasing the yield of gross domestic product and creation of employment opportunities will be available.

Crude oil as good as it has been proclaimed has just a little effect on gross domestic product; it is therefore, advisable to diversify the nation's resource base.

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