A Causal Assessment of Nigeria's Crude Oil Revenue, Health Expenditure, and Economic Growth

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ABSTRACT

Economic growth and health expenditure in Nigeria have become major priorities, and there is no doubt that health expenditure in Nigeria has risen over the years. According to studies, revenue and expenditure are important factors that contribute to a country's economic growth. Using pairwise granger causality, the study investigated the relationship between oil revenue, health expenditure, and economic growth. The variables of interest were oil revenue, health expenditures, real gross domestic product, consumer price index, and money supply. The annual time series data from 1980 to 2020 were obtained from the Central Bank of Nigeria (CBN) statistical bulletin, annual reports, and the World Bank Database. According to the findings, there is a bidirectional relationship between total health expenditure and real GDP. However, there is a unidirectional relationship between oil revenue and GDP. Furthermore, there is a unidirectional relationship between oil revenue and health expenditure. The study concluded that oil revenue and health expenditure granger cause Nigerian economic growth. Therefore, the government should make better use of oil revenue, close loopholes, and increase health spending. To increase productivity and economic growth, the government should increase public spending on health.

Keywords: Health Expenditure, Economic Growth, Oil Revenue, Nigeria, Granger Causality
JEL Classifications: I18, O47, Q34, Q47

1. INTRODUCTION

Nigeria is Africa's largest oil producer and the world's 13th largest, with oil accounting for more than 90% of exports. Crude oil has been vital to the Nigerian economy since its discovery in 1956. After nearly 50 years of exploration, the oil and gas sector remain critical to the Nigerian economy. Crude oil and natural gas have provided the Nigerian government with unprecedented revenue in recent decades. They generate 75% of the government's total revenue. Nigeria is Africa's largest oil producer and the world's 13th largest oil producer, with a maximum crude oil production capacity of 2.5 million bpd. In recent decades, crude oil and natural gas have provided the Nigerian government with unprecedented revenue. In addition, average crude oil production and export increased by 9.3 and 12.6%, respectively, to 1.88 mbpd and 1.43

mbpd in 2018, compared to 2017. In addition, average crude oil production and export increased by 9.3 and 12.6%, respectively, to 1.88 mbpd and 1.43 mbpd in 2018, compared to 2017. According to the CBN' (2018; 2019) annual report, Nigeria has nearly 40 billion barrels of proven oil reserves, with oil revenue accounting for roughly 70 and 69% of total government revenue in 2018 and 2019, respectively. However, as Kjell and Petter (2011) demonstrate, while the economies of other oil-exporting countries are thriving, Nigeria, one of Africa's largest oil producers, has continued to face poor health and slow economic growth.

According to Baghebo (2017), Nigeria's health status remains poor, trailing the global average. Nigeria's health situation is marked by low birth-age life expectancy, high infant and maternal mortality rates, and malaria and tuberculosis infections. Nigeria

has the world's fourth highest maternal mortality rate, with 576 deaths per 100,000 live births (UNICEF, 2021). There is also a high infant mortality rate of 69 per 1000 live births and a rate of under-five mortality of 128 per 1000 live births. Malaria, pneumonia, and diarrhea account for more than half of all deaths in children under the age of five, according to a UNICEF report (64 percent). Despite recent increases in investment in this area, the number of patients who can receive proper care remains limited. Every year, approximately 262,000 babies die at birth, making it the world's second highest national total. In 2021, Nigeria's life expectancy at birth was estimated to be 55 years (WDI, 2021), and the prevalence of HIV/AIDS infection has also contributed significantly to the country's low life expectancy. It was estimated to be 1.3% of the population aged 15-49 years, which is higher than the global average (0.7%). This poor health situation has hampered the country's growth because adequate and effective health care spending is widely regarded as critical to improving health outcomes (Anyanwu and Erihijakpor, 2009). At the macro level, investments in health personnel and infrastructure are intended to improve health conditions, resulting in better human capital and, consequently, higher productivity (output). In Sub-Saharan Africa (SSA) and other developing regions where resources are scarce, health spending has received less attention in government budgets (World Health Organization (WHO), 2016). As a result, there is a need to investigate the role of oil revenue, which is the Nigerian government's primary source of revenue, in the relationship between health expenditure and economic growth. To address this concern, this paper investigates the relationship between oil revenue, health spending, and economic growth. The remainder of this study includes a review of the literature, methodology, the results and discussion of the findings, conclusion, and recommendations.

2. LITERATURE REVIEW

2.1. Situational Analysis of Oil Revenue, Health Expenditure and Real GDP in Nigeria

Over the last five decades, the oil sector of the economy has grown, with oil production increasing from 390.5 barrels in 1987 to 675.3 barrels in 1998. In 1970, oil revenue totaled N166.6 million. Additionally, it increased to N1,591.7 billion in 2000 and to N5,545.8 billion in 2018. The economy has become oil-dependent as a result of the high revenue generated by the oil sector, complicating macroeconomic management (Akinlo, 2012). According to Onaolapo et al. (2013), Nigeria's petroleum industry is the country's largest and primary source of GDP, accounting for 70% of government revenue and approximately 95% of foreign exchange earnings. Oil revenue, on the other hand, has been declining in recent years (Figure 1). This is believed to have resulted in decreased government spending, particularly on health care. Oil revenue and total health expenditure as a percentage of GDP both increased from the early 1980s to 2011, but then declined. Despite deliberate efforts to increase public health spending, Nigerian governments have failed to meet the UN's recommended benchmark of 8% to 10% of GDP (Oni, 2014). The covid-19 pandemic hit Nigeria and many other African countries hard, exposing a broken healthcare system and low health indicators. With a population growth rate of 3.2 percent and a

GDP growth rate of 3.4% in 2021, Nigeria's health indicators are among the worst in Africa according to USAID. Economic growth is promoted by increased government spending on socioeconomic and infrastructure. Accordingly, Yusuf et al. (2021) suggest increasing health budget allocations to boost economic growth in Nigeria and Sub-Saharan Africa.
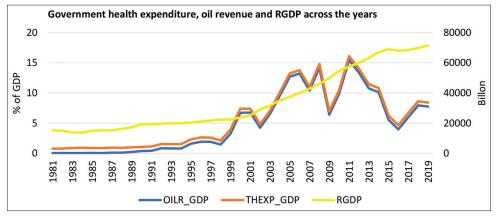
2.2. Theoretical Literature

The Wagner (1958) and Keynes' theories have been the most prominent theoretical debates on the link between government spending and growth. Domestic economic growth is seen as an important factor in the Wagner law, according to Ampah and Kotosz (2016). Wagner predicted that as trade and industrialization advanced, the role of the private sector would grow. As private sector activity grows, government spending to regulate the now-vibrant private sector will grow as well. It states that: (i) the expansion of state functions leads to increased public expenditure on economic administration and regulation; (ii) modern industrial society leads to increased political pressure for social progress and increased social consideration in industrial conduct; (iii) the increase in public expenditure is greater than the proportional increase in state functions. Musgrave and Musgrave (1988) argued that as progressive nations industrialize, the public sector's share of the national economy grows steadily, as noted by Chude and Chude (2013). Keynes (1936) noted that countries' over-reliance on Wagner's hypothesis interpretations hampered economic recovery during the Great Depression. To help economies recover from the depression, Keynes advised countries to increase public spending. Unlike Wagner's hypothesis, Keynes (1936) believes that government' spending is an autonomous and exogenous variable. Exogenous factors like government spending can be used to foster economic growth. This is because, increased government consumption will likely increase employment, profitability, and investment. Keynes went on to say that government spending increases aggregate demand and thus output by smoothing out business cycle fluctuations and stimulating economic activity. This means that government spending is the cause rather than the effect of economic growth (Wu et al., 2010). Among others, Thabane and Lebina (2016) and Okoye et al. (2019) have validated this framework.

2.3. Empirical Literature

Empirical research has yielded conflicting results regarding the effects of oil revenue on growth and health. Specifically, Akinleye et al. (2021) use augmented dickey fuller (ARDL) to examined the impact of oil revenue on economic growth in Nigeria from 1981 to 2018. The variables used in this study are exchange rate, oil revenue, petroleum profit tax and inflation. The result shows that oil revenue have a positive and significance effect on economic growth (RGDP) in both short and long run. The findings were consistent to Aminu and Raifu (2019) which indicate oil revenues have significant positive effects on economic growth in both the short-run and long-run. Similarly, Fasina and Adegbite (2016), conducted research on the impact of the petroleum profit tax (PPT) on the Nigerian economy from 1970 to 2010. The variables used in this work were the exchange rate, inflation, petroleum profit tax, and GDP (GDP). Data was analyzed using multiple regression

Figure 1: Trend of real gross domestic product, oil revenue and total health expenditure.

Source: Central Bank of Nigeria and World Bank Development Indicators

analysis. The study discovered that crude oil revenue was very beneficial to the Nigerian economy during the study period, and natural resources had a positive relationship with economic growth and development. Likewise, Aregbeyen and Kolawole (2015) examined the relationships among oil revenue, government spending, and economic growth in Nigeria from 1980 to 2012. Granger causality was to determine the direction of causality and findings from the analysis revealed that oil revenue granger caused both total government spending and growth. Odularu (2018) also discovered that domestic consumption and crude oil exports significantly contribute to the improvement of the Nigerian economy. This finding was consistent with the evidence provided by Olatunji and Adegbite (2018); Abdul-Rahamoh et al. (2017), which indicates that petroleum profits contribute positively to economic growth in Nigeria.

While some studies have provided evidence about the positive impact of revenue from oil on economic growth, others have shown negative effects. Gopar et al. (2017) conducted a longitudinal study on the impact of petroleum profits tax on economic growth in Nigeria and found no causal link between petroleum profit tax and real gross domestic products. Abimbola and Onazi (2018) investigate the nexus between oil revenue and economic growth in Nigeria using OLS technique. The paper therefore concludes that oil revenue is negatively related to economic growth in Nigeria based on its findings. Akinlo (2019) investigated the importance of oil in the development of the Nigerian economy from 1960 to 2016. The study used multivariate VAR model. The results revealed that potential growth in non-oil sectors can be brought about by oil; it also revealed that oil has a negative effect on the manufacturing sector.

In the case of the relationship between health expenditure and growth, Aboubacar and Xu (2017) found that significant and positive relationship exist between health expenditure and economic growth in Sub-Saharan Africa using Generalised Method of Moment (GMM). Likewise, Piabuo and Tieguhong (2017) show that a unit change in health expenditure increased GDP per capital by 0.38 for some selected African countries. In contrast, Olayiwola et al. (2021) applying the Wagner law indicate no causal relationship between health expenditure and GDP in Nigeria. Overall, the effect of oil revenue on economic growth has received

much positive and significant results, while the effect of health expenditure on economic growth has largely remained mixed.

3. METHODOLOGY

The scope of the study covers the periods between 1981 and 2020 because of data availability that span these periods, data for this study was obtained from the Central Bank of Nigeria (CBN) statistical bulletin, annual reports and World Bank Database. The variables such as oil revenue (OILR), total health expenditures (THEX), and real gross domestic product (RGDP), consumer price index (CPI) and money supply (M2) were used. Descriptive statistics was used to describe the variables and Pair wise Granger causality was used to determine the direction of causality among the variables and the statistical significance was at $p \leq 0.05$ level of significance.

4. RESULT AND DISCUSSION OF FINDINGS

The summary statistics for the variables used in the analysis are presented in Table 1. According to the table, Nigeria's RGDP average is N34690.6 billion, but it ranges from N13779.26 billion to N71387.83 billion. Similarly, the average value of oil revenue (OILR) is N2430.35 billion, with a range of N7.25 billion to N8878.97 billion. Similarly, the average total health expenditure (THEXP) is N231.06 billion, which appears to be skewed to the right (positively skewed) when compared to the median value of N159.81 billion. There appears to be evidence of wide variability from the average value, as revealed by the standard deviation value of N132.26 billion. The consumer price index (CPI) average is N107.76, with a standard deviation of N83.34. These simply demonstrate that the variable is positively (right) skewed, albeit with a small variation. Finally, the mean and median values of the money supply (M2) are 6585.141 billion and N9911.37 billion, respectively, with a standard deviation of N9911.37 billion. Because of the volatility of their values over time, the OILR and M2 exhibit greater variation than other variables.

The Pairwise Granger Causality test was used to determine the direction of causality among the variables, and the results are shown in Table 2. According to the findings, THEXP and RGDP, M2 and THEXP, and M2 and RGDP all have a bi-directional

Table 1: Summary statistics

Variable	Obs.	Mean	SD	Median	Maximum	Minimum
RGDP	39	34690.67	20237.78	23688.28	71387.83	13779.26
OILR	39	2430.35	2723.42	1230.85	8878.97	7.25
THEXP	39	231.06	132.26	159.81	484.34	110.70
CPI	25	107.76	83.34	77.93	307.47	20.96
M2	39	6585.14	9911.37	878.46	34251.70	14.47

Source: Author's Computation based on the data from the CBN and World Bank (2022)

Table 2: Granger causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
OILR does not Granger Cause RGDP	37	4.46520	0.0195**
RGDP does not Granger Cause OILR	37	2.12048	0.1365
THEXP does not Granger Cause RGDP	37	3.73558	0.0348**
RGDP does not Granger Cause THEXP	37	7.30962	0.0024***
CPI does not Granger Cause RGDP	23	1.67976	0.2144
RGDP does not Granger Cause CPI	23	0.49819	0.6158
M2 does not Granger Cause RGDP	37	6.18712	0.0053***
RGDP does not Granger Cause M2	37	8.79816	0.0009***
THEXP does not Granger Cause OILR	37	0.26617	0.768
OILR does not Granger Cause THEXP	37	7.18781	0.0026***
CPI does not Granger Cause OILR	23	0.54492	0.5892
OILR does not Granger Cause CPI	37	2.13143	0.1476
M2 does not Granger Cause OILR	37	0.24197	0.7865
OILR does not Granger Cause M2	37	3.93925	0.0296**
CPI does not Granger Cause THEXP	23	1.29154	0.2991
THEXP does not Granger Cause CPI	23	2.93223	0.079*
M2 does not Granger Cause THEXP	37	5.57716	0.0084***
THEXP does not Granger Cause M2	37	3.51087	0.0418**
M2 does not Granger Cause CPI	23	2.14405	0.1461
CPI does not Granger Cause M2	23	2.31362	0.1276

Source: Author's Computation based on the data from the CBN and World Bank (2022). ***, ** and * correspond with 1%, 5% and 10% levels of significance respectively.

relationship, according to the findings. However, there is a one-way relationship between OILR and RGDP, THEXP and OILR, and CPI and THEXP, but no causal relationship between CPI and OILR or M2 and CPI. According to the table, RGDP granger causes OILR, THEXP, and M2. Similarly, OILR granger causes RGDP, THEXP, and M2, while THEXP granger causes RGDP, OILR, and M2. The findings of this study are consistent with the theoretical propositions of both Wagner law and the Keynesian view, as health expenditure granger causes economic growth and growth granger causes health expenditure in Nigeria. According to Ampah and Kotosz (2016), the Wagner law views domestic economic growth as a critical component that leads to increased government spending. According to Keynes, an increase in government spending is likely to increase employment and investment through multiplier effects on aggregate income. According to Anyanwu and Erihijakpor (2009), adequate and effective healthcare spending is widely regarded as critical to boosting economic growth by improving health outcomes. According to Aboubacar and Xu (2017), Piabuo and Tieguhong (2017), there is a positive relationship between health spending and economic growth in Sub-Saharan Africa. Furthermore, Akinleye et al. (2021), Aminu and Raifu (2019), and Aregbeyen and Kolawole (2015) found that oil revenue influences government spending and economic growth in Nigeria. Thus, improved economic growth and increased

health spending are linked to increased government revenue from oil in Nigeria.

5. CONCLUSION AND RECOMMENDATIONS

This study investigates the relationship between oil revenue, health expenditure, and economic growth in Nigeria. In view of the finding, this study concludes that there is a bi-directional relationship between total health expenditure and economic growth, while there is a unidirectional relationship that runs from oil revenue to economic growth and health expenditure. Based on these findings, there is a need for the government to develop appropriate policies that would result in better and more prudent use of oil revenue to boost Nigerian economic growth. To ensure that funds are properly channelled for economic growth, all loopholes in oil revenue generation should be closed. Over the years, a reasonable proportion of the budget has not been allocated to the health sector. There is a need for an increase in government spending on health at all levels (primary, secondary and tertiary institution). This will make government health expenditure to have a robust effect on Nigerian health status and meet WHO recommended budgetary allocation to the sector. The government should increase and restructure the public expenditure allocation to the health sector in order to provide more health facilities, such as drugs, laboratories, equipment, amongst other thing. Increasing government allocation and restructuring public expenditure on health could overall improve general health outcomes in Nigeria and also improve the nation economic growth.

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