

The Role of Foreign-Aid-To-Health in Public Health Expenditure Impact on Economic Growth in Nigeria: An Interactive Term Approach

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ABSTRACT: Public health expenditure is one of the important subsets of government expenditure used by governments in affecting the standard of living of their citizens, with Nigeria not left out. This is because health is seen as a channel through which human capital base of an economy can be improved. However, as the world is now a global village, it suffices to say that an outbreak/existence of disease in a country is an imminent spread of such diseases somewhere else in the globe. A vivid instance of this is the ravaging Covid-19 that has become a global pandemic. On this notion of preventing the spread and eradicating diseases and sicknesses, governments of developed worlds play important roles in granting health aids to the developing nation. It is on record that Nigeria has received robust foreign health aids from developed nations such as US, UK, France and so on, which might have helped in not only adding to her public health spending but also assisting in stimulating economic growth. However, debate still rages on whether the role of foreign aid is positive and effective in achieving the intentions of the foreign donors in helping boost the recipients' countries public health expenditure and economic growth or not. This research work therefore tries to mainly investigate the role of foreign health aid in public health expenditure-economic growth impact in Nigeria between 1980 and 2020 with the use of an interactive term and timeseries data sourced from OECD-DAC and CBN Statistical Bulletin. The time series data were analysed with the aid of the EVIEWS 10 package and the results presented. The result of the analysis reveals that foreign aid to health is individually statistically significant playing positive role in Nigeria's economy but jointly statistically insignificant with public health expenditure.

KEYWORDS: Foreign-Aid-To-Health, Public Health Expenditure, Economic Growth and Nigeria

Introduction

One of the important subheadings of government expenditure used by governments of nations, with Nigeria not left out, in improving the standard of living of their citizens is public health expenditure. This is because sound health is seen as a channel through which human capital base of an economy can be improved with resultant effect on productivity and growth. Public health expenditure is an expenditure on health services not directly incurred by the citizenries. It includes both capital and recurrent expenditures budgeted for the health sector. However, as the world is now a global village, it suffices to say that an outbreak/existence of disease in a country is an imminent spread of such diseases somewhere else or across the globe. A vivid instance of this is the ravaging Covid-19 that has become a global pandemic. It is on this notion of preventing the spread and eradicating these communicable diseases and sicknesses that governments of developed worlds play important roles in granting health aids to developing nations such as Nigeria. It is on record that Nigeria as one of the developed countries of the world that has received robust foreign health aids both in cash and kind from the developed nations such as US, UK, France and so on. Corroborating this statement, Abimbola (2019) states that Nigeria has enjoyed and continue to enjoy robust foreign assistance on health both in technical and cash from various foreign governments and international non-governmental agencies. For instance; from United States only, Nigeria received the sum of \$41million, \$67million, \$123million, \$200million, \$211million, and \$255million respectively for the years 2004, 2005, 2007, 2008, 2009 and 2010 such that in the US, Nigeria was placed among the top 10 recipients of United States foreign aid assistance in 2010 (Hill 2011). Also, in 2009, Bill and Melinda Gates Foundation in agreement with the World Bank supported the purchase of

\$25million oral polio vaccines to Nigeria (Gates & Gates 2009). These foreign health aids in kind and cash might have helped not only in boosting her public spending on health but also assisted in stimulating economic growth. In addition, with the issuance of these aids to Nigeria from abroad and the nation's budget allocation to health sector, there is no doubt that the country's health expenditure has been on the increase. For instance, Nnamuchi (2007) states that the health sector witnessed robust growth, principally as a result of unfettered support by the government coupled with assistance from international donor agencies. However, debate still rages on whether the roles of foreign aid is positive and effective in achieving the intentions of the foreign donors in helping boosting the recipients countries public health expenditure and economic growth or not. Therefore, this paper sets out to investigate the role of foreign aid in mediating public health expenditure's effect on economic growth in Nigeria, with the scope covering a 30-year period from 1991 to 2020 and limited to the Nigerian economy only.

Statement of the Problem and Justification

Schools of thoughts are divided in their thinking on whether expansion in government expenditure which encompasses its public health spending influences or hinders economic growth. While a school of thought views government expansion as detrimental to efficiency, productivity and growth others believe that for the economy to achieve high standard of living and economic growth active government participation is the key. For instance, Aboyade (1983) asserts that every developed or underdeveloped national economy requires the intervention of government in its development process. However, Ogundipe and Lawal (2011) see this as unnecessary as they perceived that health spending just like spending on environment is not necessary for development while it is the assertion of Bakare and Olubokun (2011) that the public health spending is still marginally low in Nigeria with an undetermined impact. Njeru (2003) in Abimbola (2019) views foreign aid as an important source of finance which augments the low savings, narrow export earnings and thin tax bases of most Sub-Saharan African nations. A view refuted by Williamson (2009) as he questioned the ability of foreign aid to achieve its goals stating that conceptual and empirical literatures suggest that foreign aid is ineffective. This is why this paper tries to examine foreign aid's role in public healthcare expenditure-economic growth nexus in Nigeria.

This is necessitated as no paper has been able to delve into the examination of the combined effect foreign aid to health and public health expenditure on economic growth in Nigeria at least to the best knowledge of this research work. Majority of papers only concentrated on either one of this in relation to growth with the attendant effect of overstated impact [see Bakare and Olubokun (2011); Ogundipe and Lawal (2011); Oluwatobi and Ogunrinola (2011) for instance]. It may be the case that a certain level of foreign aid is required for host countries to benefit from Health expenditure – economic growth multiplier effect.

Hypothesis

H₀: Foreign aid to health plays no significant positive role in health expenditure-economic growth nexus in Nigeria.

The Trend and Pattern of Public Health Expenditure, Foreign Aid to Health and Economic Growth

The figure 1 below shows that both public health expenditure and foreign aid to health were very high in 1990 dropped in 1991 while GDP was very low in 1990 but picked up in 1991. In 1992, public health expenditure rose from its low value in 1991 to 286.0 but dropped sharply to its minimum value of 190.2 in 1994. During this period, foreign aid to health was gradually rising from its low value in 1991 while real GDP was also gradually falling from its high value (205,222.06) in 1991 to a low value (183,563.00) in 1994. In 1995, public health expenditure rose from its minimum value in 1994 to 223.9 and 360.4 in 1996, dropped sharply to 236.4 in 1997, real GDP also rose in

1995 to 201,036.27 and 205,971.40 in 1996 with a slight drop to 204,806.50 in the same year 1997 with public health expenditure while foreign aid to health was maintaining its upward movement. In 1998, public health expenditure rose to 443.2 and continued to rise up-till 2005 where it attained 5,080.9 but later had a slight drop in 2006 to 4,851.5 from where it picked up to 63,144.2 in 2012 and continued to rise until it dropped to 39,685.5 in 2013. During this period, foreign aid to health continued its upward movement, dropped in the year 1999 to 64,507.13, rose to 77,874.35 in 2000 and 80,015.23 in 2001, dropped again to 68,111.41 in 2002 from where it continued its downward trend to 44,688.69 in 2007 and started rising from the succeeding year 2008 except in 2011 when it dropped again while real GDP rose to 219,875.60 in 1998 and continued to rise till 2001 when it dropped slightly again. Immediately after its drop in 2013, public health expenditure rose again in 2014 and continued to rise to its peak in 2018 with 163,122.90 but dropped in 2019 to 120,736.0 and sluggishly rose to 122, 326.49 at its final year while foreign aid to health and real GDP maintained their upward trend, attaining their peak in the final year 2020 with 163,649.99 and 775,525.70 respectively except foreign aid to health that dropped to 151,891.21 in the same year 2019 with its public health expenditure counterpart.

In summary, the trend in both public health expenditure and foreign aid to health has continued to exhibit an upward movement but with a zig-zag pattern while real GDP only exhibit a zig-zag pattern at the beginning of the trend but later continued to maintain an upward movement afterwards. The figure 1 below shows the trend and pattern of the public health expenditure, foreign aid to health and real GDP as discussed above.

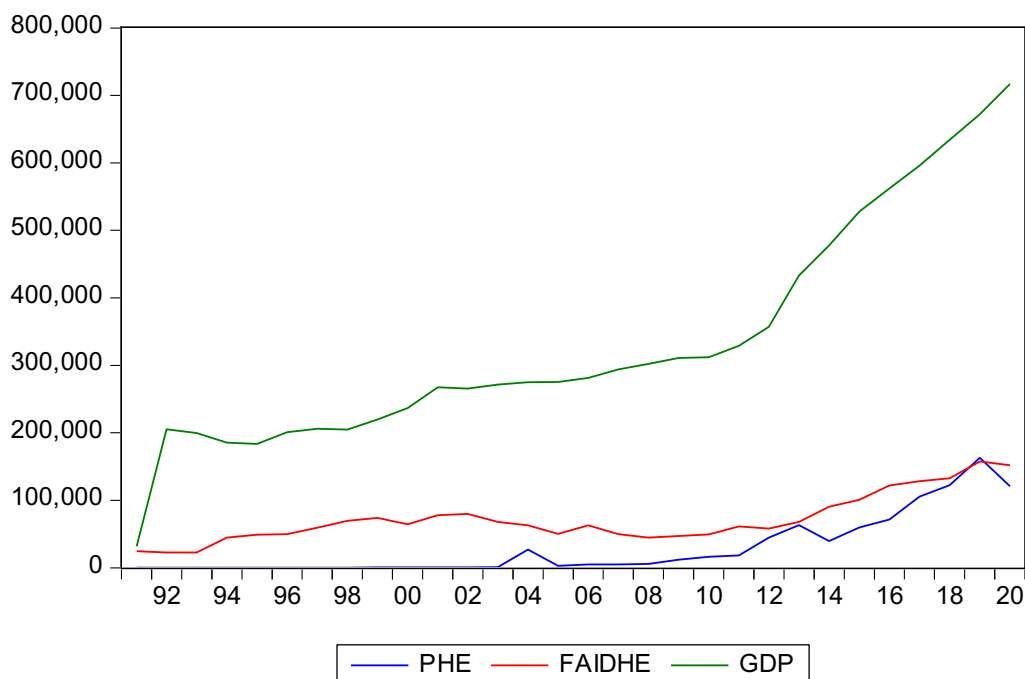


Figure 1: The Graph Showing the Trend and Pattern of Public Health Expenditure, Foreign Aid to Health and Economic Growth in Nigeria between 1990 and 2020 in Nigeria

Model Specification, Methodology, Apriori Criteria and Data Sources

This paper adopts the augmented Solow growth model as used by Kwak (2009) but with some modifications for the purpose of this study is an attempt to capture the role of foreign aid in public health expenditure-economic growth nexus. Econometrically, the OLS linear regression model is therefore stated as:

$$Y(t) = \alpha_0 + \alpha_1 K(t) + \alpha_2 A(t)L(t) + \alpha_3 PHE_t + \alpha_4 FAidHe_t + \alpha_5 PHE * FAidHe_t + \mu_t$$

Where:

$Y(t)$ = real gross domestic product as a proxy for economic growth,

$K(t)$ = Stock of physical capital which shall be represented by Gross Fixed capital Formation (GFCF),

PHE = Public Health Expenditure,

FAidHe = Foreign aid to health,

$A(t)L(t)$ = the effective labour which is simply taken as labour force in this study

α_0 = constant or the intercept of the regression line.

$\alpha_1, \alpha_2, \alpha_3, \alpha_4$ = are all parameters to be estimated for the explanatory variables.

μ_t = error term, which is included to capture the effect of other variables not included in the model but also influence the level of economic growth.

The coefficients of the model, $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$ and α_5 are expected to have positive relationship with economic growth. The method of analysis of the study began by carrying out the descriptive statistics of the variables while the estimation technique commences by performing test of stationarity on the time series macro-variables in our model. In this wise, unit root test using both Augmented Dickey Fuller (ADF) and Phillip Peron is employed in this study in order to avoid spurious regression and for us to rely on forecasting power of the model parameters. After this, the study carried out its analysis by making use of econometrics software package called- E-views '9' in running the data. The interpretation of the analysis of the role of foreign aid to health expenditure economic growth nexus is done by comparing signs and magnitude of the coefficients of both foreign aid to health and public health expenditure of the analytical result.

Real GDP: This is total value of goods and services produced in an economy over a given period, usually a year, by its residents regardless of their nationality of the residents who produced them. Real GDP is nominal GDP deflated with a price index usually consumer price index. For the purpose of this study, GDP at current market prices which has been deflated in 1990 constant basic prices is used as a measure of our economic growth (see CBN Statistical Bulletin, 2017)

Public Health Expenditures: This is the government's expenditure to health sector of a country. It is a form of public expenditure that consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation (World Health Organization National Health Account database). For this study, the sum of both government's recurrent and capital expenditures on health are used as proxy for our public health expenditure.

Foreign Aid to Health: This represents grants to a country's health sector by international governmental or non-governmental organizations either in form of cash or kind (technical or material assistance). For the purpose of this study, grants either in kind or cash denominated in US dollar is used as a measure of foreign aid to health.

This study makes use of secondary data. Therefore, annual time series data covering the period 1990 to 2020 are obtained on real GDP, capital formation, labour force, public health expenditure and foreign aid to health from the following secondary data sources: Central Bank of Nigeria (CBN) Statistical Bulletin, 2005 and 2010, Organization for Economic Development and Cooperation-Development Assistance Committee (OECD-DAC) and Pen World Tables (PWT).

Data Analysis and Interpretation

1) Descriptive Statistics

Table 1: Descriptive Statistics

	GCF	GDP	LF	PHE	FAIDHE	PHEFAID
Mean	462964.1	334483.4	36604955	29608.90	71513.19	3.48E+09
Median	123747.9	278429.0	34412170	4956.200	62981.55	2.51E+08
Maximum	3048023.	716947.7	48851361	163122.9	157560.3	2.57E+10
Minimum	8799.500	31546.76	30578274	190.2000	22744.15	5645098.
Std. Dev.	745248.3	167181.8	5657624.	45045.22	35571.69	6.53E+09
Skewness	2.086146	0.842720	0.745629	1.582305	0.998062	2.113380
Kurtosis	6.672434	2.876780	2.217615	4.424211	3.273363	6.529591
Jarque-Bera Probability	38.61850 0.000000	3.569862 0.167809	3.544974 0.169910	15.05392 0.000538	5.074047 0.079101	37.90438 0.000000
Sum	13888922	10034502	1.10E+09	888266.9	2145396.	1.05E+11
Sum Sq. Dev.	1.61E+13	8.11E+11	9.28E+14	5.88E+10	3.67E+10	1.24E+21
Observations	30	30	30	30	30	30

It can be inferred from the table 1 above that all the series are in their high level of consistency. This implies that their mean and median are within the minimum and maximum values. The deviations of the data from their mean are also small. This is shown by the low standard deviation of some of the data. Also, the Jarque-bera test of normality or asymptotic property, which is a large sample test based on the OLS residuals first computed the skewness (which is lack of statistical symmetry) and kurtosis (which is a measure of the extent to which a distribution is concentrated about its mean) of the data shows that the data are normally distributed.

2) Unit Root Test

Table 2: Unit Root Test Result Using Augmented Dickey Fuller at 5% Level of Significance

Variables	Order
Y	I(1)
K	I(1)
L	I(1)
PHE	I(1)
FAidHe	I(2)

The result from table 2 indicates that each of the series from 1990 to 2020 is stationary at first difference except foreign aid to health which is stationary a second difference using Augmented Dickey Fuller at 5%. Therefore, the null hypothesis of non-stationarity is hereby rejected at the 5% significance level suggesting that all the variables are stationary.

3) Co-integration test Result

After establishing the stationarity of the variables under investigation, the study went ahead to carry out test of long run dynamics. The trace test of the co-integration result indicates two co-integrating equations. Therefore, the result confirms that there is existence of long-run relationship among the variables which makes the policy recommendations that may arise from the data analysis useful since it will have a long-run implication.

4) OLS Result Presentation

Table 3: The result of the OLS is as presented below:

Dependent Variable: GDP
Method: Least Squares
Date: 12/04/21 Time: 22:41
Sample: 1991 2020
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-412957.6	134495.0	-3.070430	0.0052
GCF	0.024059	0.031533	0.762974	0.4529
LF	0.016191	0.004077	3.971473	0.0006
PHE	0.947531	1.099815	0.861537	0.3975
FAIDHE	2.008170	0.416139	4.825722	0.0001
PHEFAID	-8.05E-06	6.96E-06	-1.155522	0.2593
R-squared	0.963805	Mean dependent var		334483.4
Adjusted R-squared	0.956264	S.D. dependent var		167181.8
S.E. of regression	34963.08	Akaike info criterion		23.93883
Sum squared resid	2.93E+10	Schwarz criterion		24.21907
Log likelihood	-353.0824	Hannan-Quinn criter.		24.02848
F-statistic	127.8132	Durbin-Watson stat		1.512573
Prob(F-statistic)	0.000000			

This is summarized as below:

$$Y = -412957.6 + 0.024059K + 0.016191L + 0.947531PHE + 2.008170FAIDHE + -8.05E-06 PHEFAID$$

$$Se = (134495.0) \quad (0.031533) \quad (0.004077) \quad (1.099815) \quad (0.416139) \quad (6.96E-06)$$

$$t = (-3.070430) \quad (0.762974) \quad (3.971473) \quad (0.861537) \quad (4.825722) \quad (-1.155522)$$

$$R^2 = 0.963805$$

$$\text{Adjusted } R^2 = 0.956264$$

$$F\text{-Statistic} = 127.8132$$

$$\text{Akaike Info criterion} = 23.93883$$

$$\text{Durbin-Watson Statistic} = 1.512573$$

$$\text{Schwarz Criterion} = 24.21907$$

The summary of table 3 above shows that the coefficient of the explanatory variables PHE and FAidHe are 0.947531 and 2.008170 respectively. This shows that public health expenditure and foreign aid to health are both positively related with GDP and therefore conform to their a priori criteria stated earlier. Specifically, with p-value less than 5%, it implies that foreign aid to health is individually statistically significant and therefore individually exerts a positive impact on economic growth in Nigeria. However, the joint interactive term combining foreign aid to health and public health expenditure was found to be statistically insignificant. This might be due to high level of corruption in Nigeria with health sector not left out. The coefficient of foreign aid to health also implies that a thousand naira spending by foreign aid donors in Nigeria would have an anticipated impact of positive role raising the GDP level by 2,008 units. This positive relationship in essence means that the more the government spends on health, the more the level of economic growth in the economy and the more foreign aid to health received by Nigeria from aid donors the better because of the positive role it plays in health expenditure-economic growth nexus. The Durbin-Watson statistic of 1.512573 indicates the absence of serial correlation thereby making the study free of spurious regression.

Implications of Findings on Policy

Some of the policy implications of this research work are that it helps convince the foreign aid donors, both governmental and non-governmental, that aid plays positive roles in recipient countries, especially Nigeria, and therefore should be continued. Also, another policy implication is that governments especially Nigeria should create enabling environment with good economic policies that can attract more aid. This is because of the positive role and relationship that foreign aid to health was found to exhibit in the analysis of the data for this study.

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