Impact of Government Sectoral Expenditure on Economic Growth: Evidence from Nigeria

BY

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ABSTRACT
The human capital development of a country is measured using health and education. The need to provide healthy and competent manpower for nation development has been at the forefront of policy makers especially in developing countries. There have been public outcries over the poor funding of health and education sectors in Nigeria. Though, there are a lot of literatures on the impact of government expenditure on economic growth but consensus has not been reached from empirical findings about the nature of the relationship. It is on this note the study examined the impact of government sectoral expenditure on economic growth using evidence from ARDL approach. The study used secondary data sourced from CBN statistical bulletin from 1981-2017. The study adopted Vector Autoregressive (VAR) model. The VAR result revealed that government health expenditure (HEXP) has positive but insignificant effect on economic growth (RGDP). In addition, government education expenditure (EEXP) also revealed positive but insignificant effect on economic growth for the period under study. The study recommended among other things that government should improve the funding of education in order to provide quality and affordable education for the citizens so as to produce competent manpower that will contribute to the economic growth in Nigeria.
Keywords: Economic growth, health expenditure, education expenditure, VAR Model, Nigeria

Introduction

Health and education are fundamental aspect of human capital development of a nation and they are also of paramount importance to the economy of the country. It is usually said that a healthy nation is a wealthy nation. The health sector in developing countries has witnessed neglect in the last three decades. Though, this neglect has become glaring especially in Sub-Sahara Africa where there have been outbreak of diseases such as Lassa fever, Ebola and the recent COVID 19 pandemic that affected almost all countries of the world. The outbreak of these diseases in and outside of African continent and the need to urgently curtail them has made it glaring that the

health facilities in Africa are overwhelmed. This is not unconnected to the reason why African leaders usually go abroad for medical treatment and also send their children to Europe for quality education. The need to develop the human capital in African continent has generated debate on the role health and education sectors play in having productive and healthy work force. Eggoh, Houeninvo and Sossou (2015) stated that "Investing in health and education has recently constituted important social objectives because a reasonably good level of human capital increases a laborer's skills, productivity and quality of life" (p.93). Ibe and Olulu-Briggs (2015) tried to differentiate the expenditure pattern on health in developing countries from that of developed countries when they noted that "developed countries spend a high proportion of their Gross Domestic Product (GDP) on health care because they believe that their resident health can serve as a major driver for economic activities and development" (p.1). However, researchers in econometrics have acknowledged the relationship between health expenditure and economic growth by stating that there is a strong economic case for governments to increase public health expenditures (Boussalem, Boussalem & Taiba, 2014; Ehikioya & Mohammed 2013; Eggoh et al., 2015; Ibe & Olulu-Briggs, 2015; Farazmand & Hasanpour, 2013).

Nigeria as one of the developing countries has also recognized the need to invest in both health and educational development in order to ensure the human capital of the country is developed to ensure a productive and healthy workforce that can contribute meaningfully to economic growth. The need for this is not unconnected to the fact that both empirical evidence and theoretical literature have shown that both health and educational expenditure can contribute to economic growth of a country. In fact, Kareem, Samuel, Olusegun, Arogundade and Rasaq (2017) are of the view that both health and education sector are fundamental in the process of developing a country. They went further to say that only well-educated and healthy people produce optimally and contribute to economic growth. Government has given considerable attention to both education and health in Nigeria because of the role the sectors play in ensuring economic growth (Ehikioya & Mohammed 2013; Olajide, Akinlabi & Tijani, 2013). Those who advocates for large public spending argue that increased public spending on public goods like education, health

care and infrastructure are important for higher productivity (Okoye, Omankhanlen, Okoh, Urhie & Ahmed 2019).

The Central Bank of Nigeria (CBN) statistical bulletin (2018) showed that the total government expenditure to health as at 1986, 1996, 2006 and 2017 was N134 million, N3.023 billion, N62.25 billion and N236.1billion respectively. However, the education sector expenditure also show the same trend in terms of increment in allocation in 1986, 1996, 2006 and 2017 recorded N262.7 million, N11.50 billion, N119 billion and N394.90 billion respectively. The continuous rise in the expenditure has not translated into improvement in both health and education sectors. Ehikioya & Mohammed (2013) stated that the Nigerian project Agenda (2007) has shown that accessibility to health care facilities in Nigeria is low as it was revealed that only 3 out of 5 Nigerians have access to health care facilities. In addition to this, it was also reported by Vanguard news (2019) that over 10.2 million are out-of-school in Nigeria. This is an evidence that the increasing nature of expenditure on the sectors have not translated into ensuring easy access to health care and reduce out of school children in the country. Most studies on Nigeria's sectoral public spending on economic growth revealed conflicting results for example Okoye et al., (2019), Edame and Eturoma (2014), Osuji, Ehirim, Ukoha and Anyanwu (2017), Kareem et al., (2017). In as much as there may be possible impact between public health and education expenditure on economic growth, consensus has not been reached from empirical findings about the nature of the relationship. This is why this study is set to examine the impact of government expenditure on economic growth. The reason for considering health and education is not unconnected to the fact that they determine the human capital development of a country as health sector provide healthy workforce and education produce competent manpower for nation development and increase output in the country. Therefore, the research is carried out in order to provide answers to the following questions:

Research Questions

i. What is the impact of government health expenditure on economic growth in Nigeria?

iii. What is the impact of government educational expenditure on economic growth in Nigeria?

Research Objectives

The major objective of the study is to examine the impact of government sectoral expenditure on economic growth in Nigeria. The specific objectives are:

i. To ascertain the impact of government health expenditure on economic growth in Nigeria.
ii. To investigate the impact of government educational expenditure on economic growth in Nigeria.

Research Hypotheses

$H0_1$: Government health expenditure does not have significant impact on economic growth in Nigeria.

$H0_2$: Government education expenditure does not have significant impact on economic growth in Nigeria.

Literature Review and Theoretical Framework

The nature of relationship between government expenditure and economic growth has been a source of debate for economists theoretically and empirically. Some authors are of the view that there are basically two theories to this debate i.e Keynesian and Wagnerian (Debnath & Mazumder, 2016; Al-Fawwaz, 2016) while some are of the view that there are basically four schools of thought (Tsaurai, 2014). Tsaurai (2014) summarized the four school of thought as follows: the first category of empirical research findings supports the health expenditure-led growth perspective (Keynes, 1936) view; the second category supports the growth-led health expenditure perspective (Wagner, 1890) view, whilst the third category resonates with the feedback or bi-directional view which says that both health expenditure and the economy affect one another and lastly, the fourth category says that there is no relationship between the two

variables. Though, the two major contrasting views remain Keynesian and Wagnerian. The Keynesian theory theorized that increase in expenditure can bring about increase in economic growth over the period of time especially in recession. The root of the Keynesian theory started in 1930s during the economic depression of 1930s. He theorized that the surest way the recession can be brought to an end was to increase government expenditure and reduce tax with the aim of increasing the purchasing power of the individual. Anyebe (2015) is of the view that the Keynesian theory is a necessary instrument in averting crises related to production and employment. There is no doubt that the economic depression of 1930s was resolved through the Keynesian solution as a result of increase in expenditure and reduction in taxation, the purchasing power of the people was increased and the issue of unemployment, piled up of unsold goods and recession was resolved. This practical evidence has made the argument of the Keynesian theory to become popular and relevant in academic debate. Musgrave and Musgrave (1989), noted that "fiscal policy also has direct relationship on level of demand, they argued further that raising public expenditures will be expansionary as demand is increased in both private and public sectors".

On the other hand, Wagner's law, also known as the law of increasing state spending was named after the German economist Adolph Wagner (1835–1917). The theory posited that for any nation, that public spending rises constantly as income growth expands. In fact, it theorized that as economy of a country grow with increase in income of the people, the state activities begins to expand as a result of demand for more services from the citizens. The law predicts that the development of an industrial economy will be accompanied by an increased share of public expenditure in gross national product. Wagner's statement in formal terms has been interpreted by Musgrave and Musgrave (1989) as follows:

> As progressive nations industrialize, the share of the public sector in the national economy grows continually. The increase in state expenditure is needed because of three main reasons. Wagner himself identified these as (i) social activities of the state, (ii) administrative and protective actions, and (iii) welfare functions (p.140).

Musgrave and Musgrave (1989) further summarized the factors responsible for continuous rise in government expenditure as explained by Wagner into three separate headings: first, there is a socio-political reason because of an increase in state functions over time, for example for retirement, insurance, and natural disaster aid. Second, the nature of the economy that is, an increase of state assignments into science and technology and lastly, what he refers to as historical, which deals with servicing accumulated debt. Paparas, Richter and Kostakis (2018) noted that "Wagner concluded from the events in Germany (especially after the 1848 revolutionary upheaval) that as an economy develops, social pressure increases for more social considerations by the state and the industry" (p. 2). Wagner predicted an over proportional increase in government expenditure for the purpose of welfare state.

Wagner (1883) predicted that economic growth would be accompanied by a relative large growth of government spending. A modern formulation of Wagner's "law", mentioned by Bird (1971) might run as follows: as per capita income rises in industrializing nations, their public sectors will grow in relative importance. Thus, the causality according to Wagner's law is running from economic growth to government spending (as cited in Paparas et al., 2018, p.2).

According to Wagner's hypothesis, the outcome of increased GDP growth would be government spending while in the Keynesian hypothesis, an increase in government spending would lead to increased GDP growth (and vice versa). Clearly, the causality for Wagner and Keynes is no doubt in opposite direction of each other. Though, an economy may respect the two hypotheses where the causality is seen to be bi-directional in nature.

From the record making work of Keynes and Wagner on government spending, researchers have made frantic efforts to test the validity of these two opposing hypotheses in both developing and developed economy. These findings are reported thus:

Nasiru and Usman (2012) assessed the causal relationship between health expenditure and economic growth in Nigeria within the period of 1980-2010. They adopted Autoregressive Distributed Lag Model (ARDL), Bounds testing and Granger causality test. The result revealed that long run relationship exists between the variables and that the causality complied with bi-directional relationship between health expenditure and economic growth.

Verulava (2019) examined the influence of health capital on the economy of Georgia. The study relied on the secondary sources of data. The study revealed among other things that the health capital exerts significant impact on the economic growth in a long-run perspective.

Alor et al. (2018) examined the impact of health care expenditure on economic growth in Nigeria using time series data from 1980 to 2016. The result revealed that education expenditure is positive and statistically significant while health care expenditure had no significant impact on economic growth in Nigeria during the period of study.

Badri and Badri (2016) in their study examined the impact between health sector and economic growth in 24 selected countries of OECD in the period 2006-2013 using GMM methods. The results revealed that health spending has a significant and positive effect on economic growth, so that an increase of 1 percent of its value, economic growth 0/04 percent increased.

Buari et al. (2020) examined the impact of government expenditures in agriculture and education on economic growth in Nigeria for 1980-2017. The results revealed that education sector have positive impact on the growth of Nigerian economy. Similarly, the results of agricultural sector also revealed that agricultural outputs have positive and significant impacts on the Nigerian economy.

Boussalem et al. (2014) investigated the causality between public spending on health and economic growth in Algeria for the period of 1974-2014. The results showed existence of long-run causality between health spending and economic growth but does not reveal any short-run causality.

Kareem et al. (2017) empirically examined the relationship between health and education expenditure on economic growth for Nigeria for the period of 1979 to 2013. The study employed OLS estimation technique. A positive relationship was found to exist between economic growth and government recurrent expenditure on health and education for the period covered by the study.

Tabar et al. (2017) examined Wagnerian and Keynesian hypotheses using data of Iran's economy for the period of 1981-2012. The paper investigated the relationship between the total government expenditure, the GDP and the relationship between government educational expenditure and GDP. Going by the Wagnerian hypothesis, Real GDP, capital stock and labour force had positive, negative and positive impact on total government expenditure respectively and also showed long run relationship. In addition, the Keynesian hypothesis also showed a long-term relationship.

Tsaurai (2014) examined the relevance of the Wagner's theory in explaining the health expenditure in Botswana. This study used time series data from Botswana from 1995 to 2012. The study revealed that there is no causality relationship between health expenditure and GDP in Botswana and as such dismissed the relevance of the Wagner's theory.

Abubakar and Abdulmalik (2020) investigated the impact of agricultural sector on economic growth in Nigeria from 1981-2017. They made use of time series data for the analysis and adopted VAR model for analysis. The result from the co-integration test shows that there is no existence of long run relationship in the variables. However, the result from the VAR model revealed that there is significant relationship between agricultural output and economic growth for the period under study but revealed no significant relationship between deposit money bank loan to agriculture (DMBLA) and economic growth.

Osuji et al. (2017) investigated the relationship between government sectoral expenditure and economic growth in Nigeria. The result revealed that expenditure on education, road construction, general administration and health has positive and significant relation on economic growth while that of agriculture expenditure revealed negative relationship on economic growth for the period covered by the study.

Onyinyechi and Azubike (2016) examined government expenditure on education and economic development in Nigeria for a period of 2000–2015. The result revealed that expenditure on education has significant impact on the economy for the period covered by this study.

Eggoh et al. (2015) investigated the relationship between education and health and economic growth for 49 African countries covering the period of 1996-2010. Their findings revealed that public expenditures on education and health have a negative impact on economic growth.

Abubakar et al. (2020) examined the impact government expenditure on agricultural growth using evidence from Kogi state. The result revealed that there is no significant impact between both government capital and recurrent expenditure and agricultural growth.

Paparas et al (2018) examined the validity of Wagnerian hypothesis in United Kingdom for the period 1850-2010. The result revealed that there is presence of a long run relationship between national income and government spending and further revealed that the causality is bi-directional, thus the result support both Wagner and Keynesian hypotheses for the period under study.

Methodology of the Study

The study employed secondary data from CBN statistical bulletin. The data covered the period of 1981-2017 being a time series data. However, following the unit root test using Augmented Dickey Fuller (ADF) statistics, the study estimated ARDL model and Bounds testing approach for the long run relationship of variables under study.

In order to check for the stationarity of the series and also check the order of integration, the Augmented Dickey Fuller (ADF) test was used as Gujarati (2004) noted that time series data are expected to be stationary. However, the linear model used for this study is presented as follows:

$LNRGDP_t = \beta 0 + \beta 1 LNHEXP_t + \beta 2 LNEXP_t + \varepsilon_t$ ----------(1)

Where: LNRGDP = Natural log of Real Gross Domestic Product; LNHEXP = Natural Log of Health Expenditure; LNEXP = Natural Log of Education Expenditure; $\beta 0$ = Constant; $\beta 1$-$\beta 2$ = Parameters to be estimated; ε = Error Term

Unit Root Test

The study adopted time series data for analysis. In time series data, the first step is to test the order of integration for the variables as suggested by Gujarati (2004). The mostly used test is

Augmented Dickey Fuller (ADF) test developed by Dickey and Fuller (1979). The mathematical model to check the unit root is given as:

$$\Delta\, yt = a_0 + a_1 t + \emptyset y_{t-1} + \sum_{t=1}^{p} \beta_I\, \Delta y_{t-I} + \mu_t \quad \text{..... (2)}$$

Where Δ is first difference operator, α_0 is intercept or constant, α_1 is a trend term, ρ is a lag order of the autoregressive process, and μ_t is the error term. The ADF unit root result is reported below in table 1.

Table 1: Augmented Dickey Fuller Test

Variable	ADF test @ level	Critical Value @ 5%	ADF test @ 1st diff.	Critical value @ 5%	Order of integration
LNRGDP	0.032145	-2.948404	-3.339751	-2.948404	1(1)
LNGHEXP	-1.386465	-2.957110	-9.832980	-2.948404	1(1)
LNGEEXP	-1.996167	-2.957110	-7.559233	-2.948404	1(1)

Source: Authors' computation using Eviews 10

The decision rule of the ADF stationarity test is to accept the null hypothesis that the variable has a unit root (non stationary) if the ADF calculated value is less than the critical value and on the other hand, if the ADF calculated value is greater than the critical value @5%, the null hypothesis that the variable has a unit root is then rejected. The result from table 1 revealed that all the variables are not stationary at level but stationary at first difference because the ADF test statistics for all the variables are only greater than the critical value at 1st difference. This indicates that the variables are all integrated of order I(1).

Long run Johansen Test of Co-integration

Table 2: Test of co-integration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.289998	19.47077	29.79707	0.4595
At most 1	0.181912	7.483684	15.49471	0.5221
At most 2	0.012950	0.456197	3.841466	0.4994

Source: Researchers' computation using Eviews10

Table 2 showed that there is no co-integration judging from both Trace statistics and Max.Eigen Statistics. The result presented in Table 2 shows that both trace statistics and maximum Eigen statistics indicated the variables are not co-integrated, meaning that the variables do not have long-run relationship at 5% level of probability. This is because the trace statistics and Max Eigen statistics values are less than the 5% critical value. Hence, there is no cointegration as the null hypothesis of no cointegrating equations cannot be rejected. The model is estimated as follow:

$\lambda trace = -(\frac{T}{2})\sum_{t=r-1}^{n} Log(1-\lambda_i)$, $\lambda max\ eig = -TLog\ (1-\lambda r+1)$ .....(3)

Given that there are no co-integrating equations, the requirement for estimating short-run VAR model is satisfied. However, the lag selection criteria from the VAR model using Akaike Information Criterion (AIC) suggested lag one as shown in Table 3.

Table 3: VAR Lag Order Selection Criteria

Endogenous variables: LNRGDP LNHEALTH LNEDUC

Exogenous variables: C

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-81.40241	NA	0.028761	4.964848	5.099526	5.010777
1	27.38721	191.9817*	8.15e-05*	-0.905130*	-0.366414*	-0.721412*
2	37.14250	15.49370	7.91e-05	-0.949559	-0.006807	-0.628053
3	44.87748	10.91998	8.83e-05	-0.875146	0.471643	-0.415853

Results and Discussions

Discussion of Vector Autoregressive Model (VAR)

Table 4 Parsimonious Vector Autoregressive (VAR) Model

Dependent Variable: LOG(RGDP)

	Coefficient	Standard Error	t- statistics	P Value
RGDP(-1)	1.317825	0.175450	7.511109	0.0000
LNHEXP(-1)	0.005174	0.022371	0.231287	0.8177
LNEEXP (-1)	0.002368	0.022568	0.104938	0.9167
C	0.849155	0.413834	2.051922	0.0433

Source: Researchers' computation using Eviews10

R^2 = 0.99

R^2 (Adj) = 0.99

DW = 1.90

Decision criteria: Reject the null hypothesis if the P-value is less than 5% level of probability and if the P-value is greater than 5% level of significance, the null hypothesis should be accepted.

The VAR Model representation for the study models therefore assumes the following form:

$$y_t = \beta_{yo} + \beta_{yy1} y_{t-1} + \cdots + \beta_{yyp} y_{t-p} + \beta_{yx1} x_{t-1} + \cdots + \beta_{yxp} y_{t-p} + \beta_{yz1} y_{t-1} + \cdots + \beta_{yzp} y_{t-p} + \varepsilon_t{}^y$$
$$x_t = \beta_{xo} + \beta_{xy1} y_{t-1} + \cdots + \beta_{xyp} y_{t-p} + \beta_{xx1} x_{t-1} + \cdots + \beta_{xxp} y_{t-p} + \beta_{xz1} y_{t-1} + \cdots + \beta_{xzp} y_{t-p} + \varepsilon_t{}^x$$
$$z_t = \beta_{zo} + \beta_{zy1} y_{t-1} + \cdots + \beta_{zyp} y_{t-p} + \beta_{zx1} x_{t-1} + \cdots + \beta_{zxp} y_{t-p} + \beta_{zz1} y_{t-1} + \cdots + \beta_{zzp} y_{t-p} + \varepsilon_t{}^z \quad \ldots.(4)$$

$\boldsymbol{\beta_{xyp}}$ represents the coefficient of *y* in the equation for *x* at lag *p*. and $\boldsymbol{\beta_{zxp}}$ for *z* involving p lagged value of *z* and $\boldsymbol{\beta_{pzx}}$. $\boldsymbol{\varepsilon_t{}^y}$, $\boldsymbol{\varepsilon_t{}^x}$ and $\boldsymbol{\varepsilon_t{}^z}$ are the error terms respectively that are not related to the past values of the variables. Y is health expenditure; x is education expenditure and z economic growth.

The R-squared from the VAR estimation shows a value that is 99.6% which shows that the model is generally robust and obtained 99.6% goodness of fit. This shows that 99.6% variation in the dependent variable (LNRGDP) is accounted for by the regressors (government health expenditure and government educational expenditure). In addition, the Durbin Watson (DW) value of 1.90 is around 2 which give credence to the fact that there is no autocorrelation in the model.

Interpretations of VAR Result

The VAR model revealed that government health expenditure (GHEXP) has positive and insignificant effect on economic growth (RGDP). The relationship depicted in the model is positive which means that a percentage increase in government health expenditure leads to 0.005 percent increase in economic growth for the period under study. The P-value of government health expenditure is 0.8177 (82%) which is greater than 0.05 (5%), this means that the study does not have enough statistical evidence to reject the null hypothesis and therefore accept the null hypothesis and concludes that government health expenditure does not have significant impact on economic growth in Nigeria for the period covered by the study. The relationship depicted in this model is positive because of the positive value of the coefficient of government health expenditure. The coefficient of GHEXP is 0.005 which implies that a percentage increase in GHEXP will lead to 0.005% increase in economic growth (RGDP) for the period under study. This finding is in line with previous studies reviewed in the empirical literature such as Boussalem et al. (2014); Tsaurai (2014); Osuji et al. (2017); Eggoh et al. (2015) and Abubakar et al. (2020) and Alor et al. (2018).

Secondly, the result also revealed that government education expenditure (EXP) has positive but insignificant effect on economic growth (RGDP). The relationship depicted in this model is positive because of the positive value of the coefficient of education expenditure. The coefficient of EEXP is 0.002 which implies that a percentage increase in GEEXP will only lead to 0.2% increase in economic growth (RGDP) for the period under study. The P-value of government education expenditure is 0.9167 (92%) which is greater than 0.05 (5%), this means that the study

has enough statistical evidence to accept the null hypothesis and therefore concludes that there is no significant impact between government education expenditure and economic growth for the period covered by the study. Therefore, the insignificant value shows that government education expenditure does not contribute to economic growth. The positive relationship found between government education expenditure and economic growth is finding is in line with the work of Osuji et al., (2017); Buari et al (2020) and Kareem et al (2017).

Summary of Post Model Estimation Result

Table 5 Post Model Estimation Tests

Diagnostics	F statistics	P value	Comment
Serial autocorrelation	0.354898	70.44	No serial correlation
Heteroscedasticity	2.264104	8.56	No heteroscedasticity
Jarque-Bera (normalit test)	0.076868	96.22	Normal distribution
Ramsey Test (stability test)	0.350441	55.85	No Misspecification

Source: Authors' computation using Eviews 10

The post model tests are classified into two categories, namely: residual diagnostic tests and stability test. Tests conducted to ensure the residuals of the model are free from the effect of Serial (auto) correlation, problem of heteroscedasticity and also to ensure that the residuals are normally distributed while test conducted to ensure there is stability in the data and ensure no issue of misspecification is Ramsey Regression Specification Error Test (RESET). All the post model tests conducted have P-value greater than 5% level of probability which shows that no serial correlation, no heteroscedasticity, normally distributed data and no issue of misspecifications of model. These tests were carried out on the model to ensure that the model is reliable enough for economic forecast.

Conclusion and Recommendations

The study examined the sectoral impact of government expenditure on economic growth in Nigeria with special reference to health expenditure and education expenditure which are the two measurement of human capital development around the world. The study being a time series analysis used data from 1981 to 2017 from CBN statistical bulletin. The results from the VAR model revealed that government health expenditure (GHEXP) has positive and insignificant effect on economic growth (RGDP) and also that government education expenditure (GEEXP) has positive but insignificant effect on economic growth both in the short run. In addition, the long run result from Johansen test revealed no co-integration, meaning the result revealed that there is no existence of long run relationship in the variables and the study therefore concludes that both health expenditure and education expenditure do not have significant impact on economic growth in the long run. The study therefore recommended that government should improve the funding of education in order to provide quality and affordable education for the citizens so as to produce competent manpower that will contribute to the economic growth of the country. It was further recommended that more funds be allocated to capital expenditure in health sector in order to provide state-of-the-art medical facilities that will end medical tourism abroad in order to enhance and promote capacity for sustainable growth.

Suggestion for Further Study

This study has some limitations. It covers only two sectors of the economy and as such covering more variables would be more appropriate for further investigation. It is recommended that similar study should be replicated in a developed economy.

Conflict of Interest

The authors of this paper declared no conflict of interest in this research paper.

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