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Public Expenditure and Social Welfare on Nigeria's Economic 1980-2015

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ABSTRACT: *This work explores the impact of public expenditure and social welfare on Nigeria's economic growth over the period 1980-2015. The study employed the Augmented Dickey-Fuller test for stationarity in the time series, using Granger causality, and variance decomposition techniques, the empirical findings from the Granger causality test indicates a bidirectional relationship between life expectancy and public expenditure, and a unidirectional relationship between growth rate of GDP and life expectancy, life expectancy and secondary school enrollment. The variance decomposition revealed that Public Expenditure, Secondary School Enrollment and Life Expectancy positively influenced the growth rate of GDP both in the long and short run.*
KEYWORDS: *Public Expenditure, Social Welfare, Economic Growth Variance Decomposition*

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I. INTRODUCTION

Public Expenditures have been very instrumental in providing basic social services across African counties. It equally promotes the welfare and productivity of both the rich and the poor segments of the society. Most governments in less developed countries spend 26 percent of their GDP on the average on goods and services, a figure which have moved up to 8 percent points over the last fifteen years (World Bank, 1992).Due to the central nature of government inNigeria, government controls majority of resources, these has increased public expenditure in areas like infrastructural development, improvement of health and education (Marjit&Sasmal, 2013). Different government policies in Nigeria have led to infrastructure decay, which has brought about poor erratic power supply, poor education, poor health care, inefficient telecommunication, poor urban and rural road networks and this have resulted in a near stagnant economic performance (Bureau of Public Enterprises (BPE), 2003; Edame and Effiong, 2013).

The statistics on public expenditure in Nigeria revealed a major problem which shows that more emphasis has been placed on recurrent expenditure as opposed to capital expenditure which is expected to foster economic growth.

This study intends to assess empirically the impact of public expenditure on some selected social welfare indicators in relation to the growth of Nigeria's Economy.

II. OBJECTIVES OF THE STUDY

The broad objective of this study is to determine the effect of public expenditure, social welfare and Nigeria's economic growth. The specific objectives of this study are;

i). To investigate if social welfare responds significantly to public expenditures shocks in Nigeria.
ii). To empirically determine if there is a causal relationship between public expenditure, social welfare and Nigeria's Economic growth.

Statement of Research Hypotheses

The research hypotheses of the study;

H_{01}: The shocks from public expenditures do not significantly affect social welfare in Nigeria.
H_{02}: There is no long run relationship between public expenditure and social welfare in Nigeria.

2. Conceptual Literature

Anyanwu (1993) defined Public expenditure as the expenses which the government incurs for its own maintenance, for the benefit of the society, the economy, external bodies and for other countries. He simply put it as government spending from revenues derived from taxes and other sources. Public Expenditure is referred to as an outflow of resources from government to other sectors of the economy. Government spending can be classified into recurrent and capital expenditures. Discussing the importance of government spending, Lindauer and Valenchik (1992) stated that government spending is used to meet rapid population economic growth and subsequent demographic transitions, increase in income and taste of the people of the country that had led to increase in demand for government goods and services, increase in technological requirements for industrialization, increase in urbanization, increase in inflation over time, balance in productivity growth between public and private sector, and the need to address natural disasters among other things.

Empirical Literature

In assessing the role of public spending in sustainable growth in Nigeria, Stephen (2012) carried out an empirical study and assessed the efficiency of policy makers in allocating public expenditures. He examined the growth implications of public spending in Nigeria. The study employed Ordinary Least Square multiple regression model, for the data analysis. He used 1975 – 2008 period for the study. The study found that the increase in government expenditure did not contribute to sustainable growth in Nigeria. The findings of the study demonstrated that, the allocation of public expenditures did not fulfill the pareto - optimal criterion. The study suggested the need for the government to adopt public spending strategy that is capable of helping the poor countries to break out of their poverty trap and to join the global economy and establish the basis for private-sector-led diversified investment and economic growth.

Olabisi and Oloni (2012) analyzed the relationship between the compositions of public expenditure and economic growth in Nigeria from 1960 to 2008.Government expenditure was expected to be a means of reducing the negative impacts of market failure on the economy. They analyzed the relationship between public expenditure compositions on economic growth using the Vector Autoregressive Models (VAR). They found that expenditure on education had failed to enhance economic growth due to the high rate of rent seeking in the country as well as the growing rate of unemployment. And that expenditure on health and agriculture has positive contributions to growth while on water and education is negatively related with growth.

Taiwo and Abayomi (2011) examined the trends as well as effects of government spending on the growth rates of real GDP in Nigeria over the last decades (1970-2008) using econometrics model with Ordinary Least Square (OLS) technique. The presence of stationary between the variables was tested using Dickey – Fuller Unit root test. The result revealed absence of serial correlation and that all variables incorporated in the model were non-stationary at their levels. In an attempt to establish long-run relationship between public expenditure and economic growth, the result also revealed that the variables are cointegrated at 5% and 10% critical level. The findings of the study showed that there is a positive relationship between real GDP as against the recurrent and capital expenditure.

Odior (2011) analyzed the dynamic direct and indirect effects of government policy on health and its relation to the cyclical economic growth in the long run. He provided a brief structure of government expenditure on health in Nigeria. The paper used an integrated sequential dynamic Computable General Equilibrium (CGE) model to examine the potential impact of increase in government expenditure on health in Nigeria. The model was calibrated with a 2004 Social Accounting Matrix (SAM) data of the Nigerian economy. The result showed that the re-allocation of government expenditure to health sector is significant in explaining economic growth in Nigeria and will in the long-run lead to substantial growth of the economy.

III. METHODOLOGY

The methodology employed in this study is that of vector autoregressive (VAR) analysis developed by Sims (1980)

The General basic model of VAR (p) has the following form

$y_t = \mu + \psi\, dD_t + A_1\, y_{t-1} + \ldots + A_p y_{t-p} + \mu_t \ldots\ldots\ldots$ (1)

Where y_t is the set of K time series variables $y_t = (y_{t\ldots\ldots} y_{kt})$ A_t's are (K × K) coefficient matrices, μ_t is a vector of the deterministics term, D_t is a vector of nonstochastic variables and $\mu t = (u_t \ldots\ldots \mu_{Kt})'$ is an unobservable error term. Equation (1) is general enough to accommodate variables with stochastic trends, it is not the most suitable type of model if interest centers on the cointegration relations is the vector error correction model (VECM) .

$\Delta y_t = \Psi D_t + \Gamma_1 \Delta y_{t-1} + \ldots + \Gamma_{p-1} \Delta y_{t-p+1} + \alpha u_{t-1} + u_t \ldots\ldots$ (2)

Where $\alpha = (\alpha_{1,} \alpha_{2,} \ldots, \alpha_k)$

In the VEC model, (attention focuses on the (k × 1) matrix of cointegrating vector β) u_{t-1} which quantify the long-run relationships between variables in the system, and the (k × 1) matrix of error - correction adjustment

coefficients α, which denotes deviations from equilibrium (αu_{t-1}) to Δy_t for correction. The Γ_j ($j+1,\ldots,p-1$) coefficients in (equation 2) estimates the short - run effects of shocks on Δy_t and therefor allow the short-run and long run responses to differ. The term αu_{t-1} is the only one that includes I(1) variables. Hence, αu_{t-1} must also be I(0). Thus, it contains the conintegating relations.
Sims's seminal work introduces unrestricted vector autoregression (VAR) that allows feedback and dynamic interrelationship across all the variables in the system and appears to be highly competitive with the large-scale macro-econometric models in forecasting and policy analysis (Sims, 1980).

Model Specification

To provide an empirical insight into the public expenditure, social welfare and Nigeria's economic growth, a modified model used by (Olabisi and Oloni, 2012) in analyzing public expenditure and Nigeria's economic growth is presented below

GRGDP =f (PUBEXP, LFEXPT, SECENROL) . . . . . (3)

we estimate four-variable in our VAR model using $GRGDP_t$,$PUBEXP_t$, $LFEXPT_t$, $SECENROL_t$.

Our basic model of VAR (*p*) has the following form

$y_t = \mu + A_1 y_{t-1} + \ldots + A_p y_{t-p} + \mu_t$ . . . . . (4)

Where y_t = ($GRGDP_t$,$PUBEXP_t$, $LFEXPT_t$, $SECENROL_t$,)' is the set of 4 time series variables, A_j' are (4×4) coefficient matrices, μ is vector of deterministic terms and $\mu_t = (\mu_{1t} \ldots, \mu_{5t})'$ is an unobservable error term. The corresponding vector error correction model (VECM) for equation (4) is:

Where;

$\Delta y_t = \Gamma_1 \Delta y_{t-1} + \ldots + \Gamma_{p-1} \Delta y_{t-p+1} + \alpha u_{t-1} + u_t$. . . . . (5)

Where $\alpha = (\alpha_1, \alpha_2, \ldots, \alpha_4)$

Where;

PUBEXP = public expenditure

LFEXPT = life expectancy

SECENROL = secondary school enrollment

GRGDP = growth rate of gross domestic product.

Forecast error Variance Decomposition

Forecast error variance decomposition of the variables gives information about shocks that can forecast variables better. In practice, forecast error variance decompositions are popular tools for interpreting VAR models.

The h-step forecast error for they$_t$ variables in terms of structural innovations$\varepsilon_t = (\varepsilon_{1t}, \ldots, \varepsilon_{kt})' = B_{et}^{-1}$ can be represented as $\psi_0 \varepsilon_{t+h} + \psi_1 \varepsilon_{t+h-1} + \ldots + \psi_{h-1} \varepsilon_{t+1}$

Where $\psi_{ij\ n}$, denotes the ijth element of ψ_n .

Estimation Procedure

The estimation begins with Augmented –Dickey fuller (ADF) unit root test to confirm the stationarity states of the variables, a Granger causality test is carried out, then the variance decomposition is used to see the effect of innovations to the system model.

IV. EMPIRICAL RESULTS AND DISCUSSION

Unit Root Test.

Table 1. Unit root test.

SERIES	CRITICAL VALUE @ 5%	ADFT-STATISTIC	ORDER OF INTEGRATION
GRGDP	2.948404	-4.514049	*I*(0)
LIFEXP	-2.957110	-4.345504	*I*(2)
LOGPUBEXP	--2.954021	-4.856189	*I* (1)
SECSENROL	1.970978	-2.898547	*I* (2)

Source: Author's Analysis

Table one presents the result of stationarity test using the Augumented Dickey-Fuller test of stationarity. The result indicated that the growth rate of GDP (GRGDP) was integrated of order I(0) at 5 % level of significance meaning stationarity at level, while LOGPUBEXP was stationary after the first difference that is I(1). Life expectancy (LIFEXP) and secondary school enrollment (SECSENROL) were stationary after the second difference that is I(2). The null hypothesis of non-stationary is rejected.

Granger Causality

Table 2, Granger Causality Test.

Pairwise Granger Causality Tests
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Sample: 1980 2015
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Null Hypothesis:	Obs	F-Statistic	Prob.
LIFEXP does not Granger Cause GRGDP	34	1.34170	0.2771
GRGDP does not Granger Cause LIFEXP		6.06994	0.0063
LOGPUBEXP does not Granger Cause GRGDP	33	0.55798	0.5786
GRGDP does not Granger Cause LOGPUBEXP		2.25906	0.1232
SECSENROL does not Granger Cause GRGDP	16	1.23327	0.3287
GRGDP does not Granger Cause SECSENROL		0.55043	0.5918
LOGPUBEXP does not Granger Cause LIFEXP	33	3.43050	0.0465
LIFEXP does not Granger Cause LOGPUBEXP		13.3930	8.E-05
SECSENROL does not Granger Cause LIFEXP	16	1.39327	0.2888
LIFEXP does not Granger Cause SECSENROL		6.12488	0.0163
SECSENROL does not Granger Cause LOGPUBEXP	15	0.66393	0.5361
LOGPUBEXP does not Granger Cause SECSENROL		2.84015	0.1055

Source: Author's Analysis

Causality Test. The causality result is presentenced in table 2, the essence of this test is to establish a causal relationship public expenditure life expectancy, secondary school enrollment and growth rate of the Nigerian economy. This test gives us the direction of causality among these variables. There are usually two outcomes of this test; unidirectional or bidirectional relationship. In this study, it was observed that there was a bidirectional relationship between life expectancy and public expenditure, and a unidirectional relationship between (a) growth rate of GDP and life expectancy, (b) life expectancy and secondary school enrollment.

VAR Model Forecast Error Variance Decomposition.

The results of variance decomposition in our VAR Model reveal the forecast error in each variable that can be attributed to shocks in other variables over a ten year period. The most important source of variations in each forecast error is its own innovations.

Table 3, variance decomposition of GRGDP

Variance Decomposition of GRGDP:					
Period	S.E.	GRGDP	LIFEXP	LOGPUBEXP	SECSENROL
1	5.637828	100.0000	0.000000	0.000000	0.000000
2	6.220933	83.74460	3.081877	5.422493	7.751025
3	6.588700	75.31832	5.012795	7.242369	12.42651
4	6.841780	70.42831	6.267186	7.875187	15.42931
5	7.032106	67.16355	7.143512	8.136915	17.55603
6	7.181233	64.80911	7.776912	8.268658	19.14532
7	7.299630	63.04562	8.239182	8.350473	20.36472
8	7.393429	61.70405	8.574390	8.411417	21.31015
9	7.466870	60.68170	8.812614	8.462499	22.04318
10	7.523264	59.90912	8.976017	8.507853	22.60702

Source: Author's Analysis

From the table above, in the short run, GRGDP's own shock accounts for 75.3% variation to GRGDP, social welfare variables LIFEXP and SECSENROL and Public expenditure contributed 5%, 7.2% and 12.4% respectively to the fluctuations in GRGDP. In the long run GRGDP's own shock dropped to59.9% while that of LIFEXP, SECSENROL and Public expenditure increased to 8.9%, 8.5% and 22.6 respectively accounted to the fluctuation in GRGDP.

Table 4, variance decomposition of PUBEXP

Variance Decomposition of LOGPUBEXP:					
Period	S.E.	GRGDP	LIFEXP	LOGPUBEXP	SECSENROL
1	0.204257	20.06582	10.85451	69.07967	0.000000
2	0.269031	27.35296	20.76518	46.66359	5.218267
3	0.337694	28.33112	28.26844	29.77976	13.62068
4	0.416162	26.96484	32.29117	19.80403	20.93996
5	0.501471	25.25960	34.15841	14.22438	26.35761
6	0.591131	23.77099	34.92619	11.02243	30.28039
7	0.683614	22.56766	35.15088	9.102073	33.17938
8	0.777947	21.60493	35.10566	7.902517	35.38690
9	0.873437	20.82685	34.92637	7.129181	37.11761
10	0.969537	20.18791	34.68273	6.619633	38.50973

Source: Author's Analysis

From the table above, in the short run, innovations on Public Expenditure was not largely caused by its own shocks (46.6%), similarly shocks to GRGDP, LIFEXP and SECSENROL caused 27.3%, 20.7% and 5.2% fluctuation in Public Expenditure. In the long run, own shock of Public Expenditure declined significantly to 6.6%, while shocks to GRGDP, LIFEXP and SECSENROL, accounted for an increase in the fluctuation of Public Expenditure by 20%, 34.7% and 38.5% respectively.

Table 5, variance decomposition of LIFEXP

Variance Decomposition of LIFEXP:					
Period	S.E.	GRGDP	LIFEXP	LOGPUBEXP	SECSENROL
1	0.124281	7.523863	92.47614	0.000000	0.000000
2	0.239735	25.20694	69.78975	0.302910	4.700401
3	0.377208	27.72451	59.72038	0.131161	12.42395
4	0.536003	27.01216	53.52356	0.305933	19.15835
5	0.712973	25.68813	49.26187	0.681700	24.36829
6	0.904874	24.38724	46.16127	1.121310	28.33018
7	1.108846	23.25091	43.81483	1.557358	31.37690
8	1.322446	22.28937	41.98322	1.962836	33.76458
9	1.543576	21.48021	40.51662	2.329678	35.67349
10	1.770422	20.79651	39.31703	2.657928	37.22853

Source: Author's Analysis

From the table above, own impulse of LIFEXP accounts for 59.7% fluctuation in LIFEXP, shocks to GRGDP, PUBEXP and SECSENROL accounts for 27.7, 0.11% and 12.4% fluctuations in LIFEXP respectively. In the long run, LIFEXP own shock dropped to 39.3%, similarly shock of PUBEXP, SECSENROL and GRGDP accounted for fluctuation in LIFEXP by 2.6%, 37.2% and 20.7% respectively.
Table 6, variance decomposition of LIFEXP

Table 5, variance decomposition of SECSENROL

Period	S.E.	GRGDP	LIFEXP	LOGPUBEXP	SECSENROL
1	2.458373	0.137479	15.11373	5.231242	79.51755
2	3.053215	1.753723	12.63225	6.388135	79.22589
3	3.339378	1.642286	10.92297	8.167507	79.26724
4	3.469495	1.637778	10.22938	9.598558	78.53428
5	3.551916	2.580191	11.23337	10.27332	75.91311
6	3.682995	4.909957	14.48532	9.955855	70.64886
7	3.940723	8.375666	19.59788	8.741247	63.28521
8	4.369772	12.03749	25.13060	7.132082	55.69982
9	4.976973	15.00402	29.68220	5.682163	49.63162
10	5.743280	16.97725	32.74969	4.651693	45.62136

Source: Author's Analysis

From the table above, in the short run, SECSENROL's own shock accounts for 79.2% variation to SECSENROL, shocks to GRGDP, LIFEXP and PUBEXP contributed 1.6%, 10.9% and 9.5% respectively to the fluctuations in SECSENROL. In the long run SECSENROL's own shock dropped to 45.6% while that of GRGDP, LIFEXP and PUBEXP increased to 16.9%, 32.7% and 4.6 respectively accounted to the fluctuation in SECSENROL.

V. CONCLUSION AND RECOMMENDATIONS

This study investigated the impact of public expenditure and social welfare on economic growth in Nigeria between 1980 and 2015. The empirical findings from the Granger causality test indicates a bidirectional relationship between life expectancy and public expenditure, and a unidirectional relationship between growth rate of GDP and life expectancy, life expectancy and secondary school enrollment.

From the Variance decomposition, it was seen that in the short run, GRGDP's own shock accounts for 75.3% variation to GRGDP, while LIFEXP, SECSENROL and Public expenditure contributed 5%, 7.2% and 12.4% respectively to the fluctuations in GRGDP. In the long run GRGDP's own shock dropped to 59.9% while that of LIFEXP, SECSENROL and Public expenditure increased to 8.9%, 8.5% and 22.6 respectively which accounted to the fluctuation in GRGDP.

The empirical findings in this study indicates a positive relationship between public expenditure social welfare and Nigeria's Economic growth.

The following recommendations are given;

i) Government spending on projects that will improve living conditions of the populace should be encouraged.
ii) Government expenditure on education should be increased.

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