# Government Expenditure and Sap in Nigeria: An Empirical Perspective

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## ABSTRACT

This study examines the impact of government expenditure for infrastructure on economic growth before and after the introduction of SAP in Nigeria, using annual data for the period of 1970 to 2022. Data were sourced from CBN Statistical Bulletin on government spending on transport, communication, health, education, and utilities sectors. Augmented Dickey-Fuller Test and Auto Regressive Distributed Lag Model were employed as analytical tools for the study. The results show a positive short run effect of growth rate of government spending on transportation sector, communication sector, health sector, education sector and utility sector on economic growth in Nigeria during the pre-SAP and SAP periods. The opposite becomes the case to cover from the post-SAP period till date not minding the period anchored a lot more of government policies targeted at the economic development of Nigeria. The study therefore recommends that government should ensure that what is annually budgeted for infrastructural development in the country should be judiciously and economically spent in other to attain economic growth.

**Keywords*:*** Government Expenditure, Infrastructure, ARDL, Pre-SAP era, SAP era. JEL Classification: H50, H51, H52, H53, H54, L88, L97, Y10

## INTRODUCTION

Government expenditure is an important macroeconomic wheel for driving an economy to sustainable growth and development if adequately utilised. Central Bank of Nigeria (2016) defines government expenditure as a flow of resources from government purse to other sectors of the economy on a recurrent and capital nature in which capital expenditure is mostly devoted to the development of infrastructure in an economy. Over the years, the Nigerian government had invested consistently in the development of infrastructure in order to enhance growth and attain infrastructural development. This spanned from periods before and during the introduction of SAP in Nigeria and periods afterwards. The period of study is of utmost importance because the country had gained independence and was investing in infrastructural development so as to meet up with the demands of an independent economy. The government rolled out plans on how to attain this set fit.

Starting from the first national development plan, over seventy per cent of the total capital expenditure of 2.2 billion naira was devoted to those sectors which contributed directly to economic growth (primary production; trade and industry; electricity; transport system; communications; irrigation and industrial water supplies), though there was a disruption due to the civil war. The second national development plan of 3.2 billion naira with an expected annual average growth rate of seven per cent, contained policy framework and programmes for the reconstruction of the damaged areas of the country due to the civil war. It is observed from the third national development plan that the sectoral percentage distribution of the gross capital expenditure of 30 billion naira which was later reviewed upwards to 43 billion naira showed that the economic sectors of agriculture, water supply, and urban road development had the largest expenditure. Also in the fourth national development plan, out of a total of 1.2 billion naira budgeted for capital expenditure, National Basic Health Scheme consumed the sum of 100 million naira, while the establishment of new hospitals gulped about 150 million naira. [National Bureau of Statistics (NBS), 2021].

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By 1986, the government introduced the Structural Adjustment Program (SAP) with the establishment of

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directorate of food, roads and rural infrastructure (DFRRI). In that fiscal year, the directorate gulped the sum of ₦ 300 million, in 1987 it received ₦ 400 million while ₦ 500 million was spent on the agency in 1988 to develop rural infrastructure. By 1994, the government established the petroleum special trust fund charged with the responsibility of using the gains from increase in the prices of petroleum products to complete all government-abandoned projects and rehabilitate decaying infrastructure in the country. A total of ₦ 120 million was used to drill boreholes in some selected states, ₦ 11, 953 million was used to construct roads between 1995 and 1997, while a total of ₦ 9,588 billion was expended on education specifically, university education.

Not minding the huge amounts that have been spent to achieve infrastructural development in Nigeria, there still exists a gap between what is spent and the infrastructure available for the usage of the citizens within these periods. There still exists so much dearth of infrastructure within the country thereby making it very difficult for the economy to grow. Empirically, it was revealed by some authors that government expenditure on infrastructure had positive significant impact on economic growth in Nigeria (Buari, Alexander, Saheed & Alfa, 2020; Nimenibo & Samuel, 2020) whereas some other work showed that no matter government expenditure on infrastructure, it ends up having a negative impact on economic growth (Babatunde, 2018).

From available statistics, the average growth rate in Nigeria increased from 26% to 34% between 1970 and 1979 and fell on average to -3.4per cent between 1980 and 1984 [Africa Economic Outlook, (AEO) 2016], [Central Bank of Nigeria, (CBN) 2020]. Epileptic growth rates were observed during the SAP period and further declined to 8.48 per cent by 2000. This infrastructural gap witnessed aroused the interest of this research in order to determine the impact government spending on infrastructure has on economic growth in Nigeria during the pre-SAP and SAP periods in Nigeria. The research seeks to determine if the Nigerian economy was doing well before the introduction of SAP in Nigeria and what the situation was during the SAP policy.

This analysis is based on government expenditure on key Nigerian sectors to include education, public health, communications, transportation and public utilities and its impact on economic growth by providing answers to the following questions:

1. What impact does government spending on infrastructure have on Nigeria's economic growth during the pre-SAP period?

2. What impact does government spending on infrastructure have on Nigeria's economic growth during the SAP period?

3. Was the introduction of SAP in Nigeria necessary?

The objective of the study is to examine the impact government spending on infrastructure has on Nigeria's economic growth during the pre-SAP and SAP periods and to ascertain the necessity of the SAP policy in Nigeria. The hypotheses for the variables were tested in null form in accordance with the objectives of the study and the outcome of the study will be beneficial to other researchers because they will find the results of this study and its contribution to scholarship useful as a reference material for undertaking further studies. The rest of the paper is structured into literature review, research methods, result presentation, analysis, and discussion and finally conclusion and recommendations.

## LITERATURE REVIEW

### 2.1. Concept of Economic Growth and Government Expenditure

Dewett (2005) defined economic growth as an increase in the net national product in a given period of time. He explained that economic growth is generally referred as a quantitative change in economic variables, normally persisting over successive periods.

Central Bank of Nigeria (2016) defines government expenditure as a flow of resources from government purse

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to other sectors of the economy on a recurrent and capital nature. The recurrent expenditures are for payment of salaries and overheads while the capital covers the payments for financial assets. Deng (2013) views core infrastructure as comprising of highways, water, electricity and communications facilities. Public services provided by core infrastructure components may enter directly into private-sector production or even into aggregate production function.

## 2.2. Theoretical Review

### 2.2.1. Theory of Unbalanced Growth

The theory of unbalanced growth was propounded by Albert Hirschman in 1958. According to the theory, investment should be made simultaneously and harmoniously in a few selected sectors or industries for their rapid development, and the economies accruing from them can be utilized for the development of other sectors.

Hirschman maintained that development can only take place by unbalancing the economy by investing either in social overhead capital or in directly productive activities. In social overhead capital are included investments on education, public health, communications, transportation and conventional public utilities like light, water, power, irrigation and drainage schemes, etc. A large investment in social overhead capital will encourage private investment later in directly productive activities. In Hirschman's opinion developing countries do not have all the capital to provide the required factor input that will lead to balanced economic growth. Hence Hirschman advocates unbalanced economic growth for developing countries.

## 2.3. Empirical Literature

This study reviewed a few out of the numerous research works carried out by scholars on the impact of government expenditure for key infrastructure on economic growth in Nigeria.

Nwude, Nwaeze and Nwude (2023) examined the impact of government expenditure on education, health, agriculture, pensions and gratuities and public debt servicing on economic growth of Nigeria for forty-year period 1981-2020 which was collected from Central Bank of Nigeria Statistical Bulletin and Nigeria Bureau of Statistics. Augmented Dickey-Fuller was used for unit root test in which all the variables were stationary at first difference where as the Johansen co-integration test revealed a long-run equilibrium relationship among the variables. Results from the Vector Error Correction Model reveal that expenditure on education has both long run and short run positive and significant impact on economic growth. Also expenditure on health and agriculture has positive and significant impact on economic growth while pensions and public debt servicing has negative and non-significant impact on economic growth in the long run but positive and non-significant in the short run. The recommends that Government should increase funding to education, health, agriculture in order to increase the level of productivity and economic growth, encourage retirees to invest their pensions and gratuities in economic enhancing ventures, and limit its borrowings especially from external sources.

Ojo and Ojo (2022) studied Nigeria's health expenditure, education, and economic growth, from 1981 to 2019 using error correction model as an estimating approach with real GDP as the dependent variable and education expenditure index, the health expenditure index, inflation, life expectancy rate, maternal mortality rate and GDP growth as the explanatory variables. The results show that government expenditure on education and health has a positive and significant impact on economic growth in Nigeria. The study recommends that the government should enhance current health and education facilities in the country so as to encourage economic growth.

Obayori and Akpan (2022) studied Government spending in education and human development index in Nigeria from 1990-2020 using secondary data from CBN statistical bulletins and World Development Index (WDI). Parsimonious error correction method was the main technique of analysis with Human Development Index (HDI) as the dependent variable and government capital and recurrent expenditure on education as the explanatory variables. The results show that government capital expenditure in the education sector has positive and significant impact on HDI while government recurrent expenditure in the education sector has positive but insignificant impact on HDI. The study recommends that government education spending in

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Nigeria should be skewed towards capital component rather than the usual recurrent component.

Nurudeen, Sani and Adewinle (2021) studied the relationship existing between government expenditure and economic growth in Nigeria. GDP was used as the dependent variable while government expenditure and inflation were the independent variables. The econometric techniques employed in the analysis were Ordinary Least Square and Granger causality techniques. The result shows that there exists a positive and significant relationship between government spending and economic growth and a negative relationship existing between government expenditure and inflation in Nigeria. The study therefore recommends that there should be increased government spending in line with the recommendation of Wagner's law to the Nigerian Economy.

Amadi and Alolote (2020) studied the effects of government infrastructural expenditure on economic development in Nigeria using secondary data for the period 1981 to 2018. Vector Error correction model was used with government expenditure on key sectors of the economy such as transport, communication, education, health, agriculture and natural resources were the independent variables whereas economic growth proxied by GDP was the dependent variable. The findings show that government spending on transport, communication, education and health infrastructure had significant positive effect on economic growth while government spending on agriculture and natural resources infrastructure had a significant inverse effect on economic growth in Nigeria. The study recommends that government should contribute as much as the private sector in spending on agriculture and natural resources infrastructure in Nigeria.

Azolibe, Okonkwo and Adigwe (2020) examined whether government expenditure on infrastructure has significant impact on the level of domestic investment and foreign direct investment (FDI) in Nigeria. Econometric techniques of analysis were employed with government expenditure on key infrastructure as the independent variables and domestic investment/(FDI) as the dependent variable. The cointegration result shows that government expenditure on road, transport, defense, and health infrastructure have positive but insignificant impact on domestic investment and FDI in Nigeria. The study then recommends that government should increase but monitor its expenditure level since government infrastructure expenditure is a good driver of investment in the economy which when well utilized results in economic growth in Nigeria.

Buari, Alexander, Saheed and Alfa (2020) studied the impact of government expenditures in agriculture and education on economic growth in Nigeria over the period 1980 -2017. For the independent variables, agriculture was disaggregated into agricultural outputs, government expenditures on agriculture and poultry while education was disaggregated into government expenditures on education and school enrolment while making GDP the dependent variable. The results indicate that all the variables employed in the model have positive and significant impacts on the Nigerian economy. The study recommends that capital projects should be geared towards the diversification of agricultural and educational sectors within the economy.

Kolawole Bashir (2020), studied the impact of government capital expenditure on infrastructure development in Nigeria using secondary data for the period 1981 to 2018. ARDL and Granger-causality techniques were employed with Real GDP as the dependent variable and FDI, ODA, government capital expenditure and credit to the private sector as the independent variables. The study finds that while FDI and ODA have insignificant negative impact on infrastructure development in Nigeria, government capital expenditure, credit to the private sector and real GDP impact positively on infrastructure development in Nigeria. The study thus recommends that since government expenditure positively impacts on infrastructure development in Nigeria, government should increase capital expenditure in order to bridge infrastructure gap in the country.

Nimenibo and Samuel (2020) studied the empirical evaluation of how public expenditure on infrastructure influences economic growth in Nigeria from 1985 to 2015 using OLS. The result shows that both government capital expenditure and recurrent expenditure has a positive and significant impact on economic growth in Nigeria. A study by Ndubueze, Okoli, Onwuka and Mba (2020) on the impact of government expenditure on unemployment in Nigeria from 1981 to 2016, utilized ordinary least square technique. The result showed that government expenditure does not have any significant impact on unemployment in Nigeria.

Abubakar, Yusuf and Abdulmalik (2020) studied the impact of government expenditure on agricultural growth in Nigeria from 2000-2018 using vector autoregressive model. The result revealed that there is no significant

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relationship between government capital expenditure and agricultural growth in Kogi State as well as that there is no significant relationship between recurrent expenditure and agricultural growth in Kogi State. The study recommends that Kogi State government should increase agricultural expenditure to 10% Maputo declaration benchmark and also ensure timely release of fund for the procurement of agro-equipment to crop farmers in the state.

Iorja and Isa (2020) studied Infrastructure and sustainable economic diversification in Nigeria using qualitative research techniques. Revenue composition, infrastructural index, diversification index were the independent variables while real GDP growth rate was the dependent variable. The result shows that adequate infrastructural development has a positive impact on economic growth in Nigeria. The study recommends that policy makers and government of Nigeria should give priority attention to investment in crit ical infrastructural development so as to achieve economic growth.

Awode (2019) examined whether government expenditure in Nigeria has had any influence on economic growth using secondary data from 1981 to 2016. Johansen cointegration technique, error correction mechanism and Granger causality techniques were employed in the analysis with government capital and recurrent expenditure as the independent variables and real GDP as the dependent variable. The cointegration result shows that recurrent expenditure has a significant positive impact on real GDP, while capital expenditure has a negative impact on real GDP. The Granger causality test revealed that both capital and recurrent expenditures Granger cause real GDP. The study recommends that government expenditure on capital projects should be monitored extensively to ensure that they are judiciously expended so that they can exert the expected impact on the economy.

Babatunde (2018) investigated government spending on infrastructure and economic growth in Nigeria. He employed both primary and secondary data in the analysis to cover 1980 to 2015. The secondary data was analysed using co- integration tests and vector error correction model with Gross Domestic Products as the dependent variable and government annual spending on transport, communication, education, health care, agriculture and natural resources infrastructure were the independent variables For the primary data, a sample of 242 respondents was utilised for the study using descriptive statistics. Findings from the study indicate that government spending on transport and communication, education and health infrastructure has significant effects on economic growth while government spending on agriculture and natural resources infrastructure has negative effect on economic growth in Nigeria. The study recommends that government should contribute as much as the private sector in spending on agriculture and natural resources infrastructure so as to attain economic growth in Nigeria.

Edame and Fonta (2014) studied the impact of government expenditure on infrastructure on Nigerian economic growth using Co-integration and Error Correction techniques on secondary data obtained from 1980 to 2011with rate of urbanization, rate of openness, government revenue, external reserves, population density and type of government as the independent variables and economic growth proxied by GDP as the dependent variable. The ECM result shows that it takes a speed of as high as 99 percent to correct the previous year's disequilibrium in the current year and that of the Chow test revealed that the public expenditure on infrastructure were stable and did not change over time. The study therefore recommends that government should maintain the stability observed in public expenditure on infrastructure over the years under study so that the economy can attain economic growth.

Additional empirical literature from African countries that benefitted from SAP policy is reviewed below:

Juliet Elu (2000) studied the Impact of Ten Years of IMF (SAP) Reform using Sub-Saharan Africa (SSA) as case study. Most of the SSA countries turned to International Monetary Fund (IMF) for assistance under the Structural Adjustment Program (SAP) in the eighties with the hope of resuscitating their economies. SAP was structured in such a manner to enhance and promote export-led growth for these countries through market mechanism. The conditions these countries were subjected to in order to benefit from SAP led to trade liberalization, currency devaluation, economic efficiency, reduced state expenditure, and fiscal responsibility on them. At the end of the day, not minding the conditions SSA countries were subjected to, all these efforts led to insignificant changes in their balance of payment, short-term growth with increased inflation, severe

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economic and social impacts on both their short run and long run equilibrium. Results from this research indicates that SAP has successfully promoted export-led growth in the short term with minimum sustainable investment, and inadequate welfare and development due to declining per capita income in SSA countries. This can be attributable to the fact that increased export earnings from SAP have been used to service accrued debt of these countries and hence no viable economic growth has taken place in them. Another finding is that the program has the potential to promote export-led growth, but not investment-led growth which is highly desired in the region. The study therefore recommends that for sustainable growth and development in SSA countries, policies to promote domestic and foreign investment is essential for success and also there is need for implementation of polices that will enhance domestic and foreign investment for sustainable growth and development in SSA countries.

Neiman C Young (2012) studied the Association between Structural Adjustment Program Participation and the Economies of Select Sub-Saharan African Nations. The Nigerian Structural Adjustment Program (SAP) was a continental strategy that served for resolving the fiscal setbacks of Sub-Saharan Africa. The efficacy of the SAP has reflected in the abject lack of consensus among policymakers as to whether the SAP provided sufficient economic structural support. The paper evaluated SAP and identified its influence on the Sub-Saharan economy. Operating within the broad conceptual frame work of program evaluation, the study sought to determine if predictive associations could be documented linking 10 economic variables most commonly utilized in the international community with participation in the SAP among the nations of Sub-Saharan Africa. Data on these 10 core economic performance factors was obtained through the World Bank, the International Monetary Fund, and a selection of non-governmental organizations for 24 African nations (12 SAP participants, 12 nonparticipants). Logistic regression was used to test if economic performance was significantly associated with participation in the SAP. The results shows that none of the variables were significantly associated with SAP membership, thus suggesting that SAP member and non-SAP member nations shared a characteristically similar economic infrastructure. Result from the employed ANOVA analysis indicated SAP countries were less urbanized, had lower debt, but also lower per capita income than did non-SAP countries. The study recommends that for there to be positive social change, the global community should be informed in evaluating the SAP as a viable Sub-Saharan economic policy.

## RESEARCH METHODS

### 3.1. Model Specification

The theory on which this research work was framed on is a combination of the endogenous growth model and unbalanced growth theory.

$$Y = f(K, L, A) \quad 3.1$$

$$GDP = f(K, L, SOC)$$

Where Social Overhead Capital SOC was further decomposed into government spending on transport, communication, health, education, and utilities sectors in line with the unbalanced growth theory.

$$GDP = f(GFC, HDI, TRANS, COMM, HTH, EDU, UTL) \quad 3.2$$

The mathematical and econometrical form of the model with the variables converted to growth rates is given as follows:

$$GDPGR = \beta_{0+} \beta_1 GFCGR + \beta_2 HDIGR + \beta_3 TRANSGR + \beta_4 COMMGR + \beta_5 HTHGR + \beta_6 EDUGR + \beta_7 UTLGR + \mu \quad 3.3$$

Where:

GDPGR = gross domestic product growth rate as measure of economic growth;

GFCGR = gross fixed capital growth rate as measure of capital;

HDIGR = human development index growth rate as measure of human capital (labour);

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TRANSGR = growth rate of government spending on Transportation sector;

COMMGR = growth rate of government spending on Communication sector;

HTHGR = growth rate of government spending on Health sector;

EDUGR = growth rate of government spending on Education sector;

UTLGR = growth rate of government spending on Utility sector;

$\beta_0$ to $\beta_7$ are the parameters being estimated and $\mu$ other variables not explicitly included in the model

Following Pesaran et al (2001), the Error Correction Model (ECM) of the unrestricted Autoregressive Distributed Lag (ARDL) equation based on equation 3.3 was specified as follows:

$$\Delta GDPGR_{it} = \beta_0 + \beta_1 GFCGR_{it} + \beta_2 HDIGR_{it} + \beta_3 TRANSGR_{it} + \beta_4 COMMGR_{it} + \beta_5 HTHGR_{it} + \beta_6 EDUGR_{it} = \beta_7 UTLGR_{it} = \sum_{i=1}^{k} a1\Delta GDPGRit - i + \sum_{i=1}^{k} a2\Delta GFCGRit - i + \sum_{i=1}^{k} a3\Delta HDGRIit - i + \sum_{i=1}^{k} a4\Delta TRANSGRit - i \sum_{i=1}^{k} a5\Delta COMMGRit - i + \sum_{i=1}^{k} a6\Delta HTHGRit - i + \sum_{i=1}^{k} a7\Delta EDUGRit - i + \sum_{i=1}^{k} a8\Delta UTLGRit - i\mu_{it} \quad 3.4$$

Where $\mu_t$ was the error term

### 3.2 Nature and Sources of Data

The study depended on secondary data that were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin various issues and National Bureau of Statistics. It covered the period from 1970 to 2022.

### 3.3 Estimation Technique and Procedure

First, the study examined the time series properties of the variables included in the model using the Augmented Dickey-Fuller (ADF) test. To achieve the first and second objectives, the Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration was employed. A comparism of the outcome of the first and second objectives with the periods after them was used to determine the third objective.

## RESULT PRESENTATION, ANALYSIS, AND DISCUSSION OF RESULTS

### 4.1. Time series properties of the variables

The ADF test was done with the following hypothesis:

Null hypothesis ($H_0$): Variable contains unit root and hence is non-stationary.

Alternative hypothesis ($H_1$): Variable does not contain unit root and hence is stationary.

The decision rule is that: If the calculated ADF test statistic is greater than the test statistic values, reject the null hypothesis of non-stationarity and accept the alternative of stationarity, otherwise accept the null hypothesis of non- stationarity.

Table 4.1: Unit root test results for pre-SAP period

| Variable | ADF Statistic values | Test Critical values @ 5% | Order of Integration |
|---|---|---|---|
| GDPGR | -3.420429 | -3.081002 | I (0) |
| TRANSGR | -3.461284 | -1.966270 | I (0) |
| COMMGR | -4.013553 | -3.081002 | I (0) |

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| | | | |
|---|---|---|---|
| HTHGR | -3.569309 | -3.075302 | I (0) |
| EDUGR | -5.102572 | -3.828975 | I (0) |
| UTLGR | -5.501198 | -3.828975 | I (1) |

Source: Researchers' computation (2024).

Following the results of Table 4.1, it can be seen that all the variables in the model except the growth rate of government spending on the utility sector passed the ADF test at first difference and integrated of the same order I (1). This means that while GDPGR, growth rates of government spending on transportation sector, communication sector, health sector and education sector passed the stationarity test at level, only the growth rate of human development index and growth rate of government spending on utility sector were stationary at first difference. Thus, the null hypothesis of no stationarity was rejected for all the variables in favour of the alternative hypotheses that there is stationarity for all the variables used in the study.

Table 4.2: Unit root test results for SAP period

| Variable | ADF Statistic values | Test Critical values @ 5% | Order of Integration |
|---|---|---|---|
| GDPGR | -4.873302 | -3.119910 | I (0) |
| TRANSGR | -7.699193 | -3.144920 | I (1) |
| COMMGR | -2.609122 | -1.974028 | I (1) |
| HTHGR | -4.106165 | -3.212696 | I (1) |
| EDUGR | -4.106393 | -3.212696 | I (1) |
| UTLGR | -4.862513 | -3.395302 | I (1) |

Source: Researchers' compilation (2024).

Following the results of Table 4.2, it can be seen that all the variables in the model except GDPGR sector passed the ADF test at first difference and integrated of the order I(1). This means that while growth rates of government spending on transportation sector, communication sector, health sector, education sector and utility sector passed the stationarity test at first difference, only GDPGR was stationarized at level. Thus, the null hypothesis of no stationarity was rejected for all the variables in favour of the alternative hypotheses that there is stationarity for all the variables used in the study.

### 4.2 Autoregressive Distributed Lag (ARDL) Bound Test Result

This bound test enables us to test for long run dynamic relationship among the variables in ARDL modelling approach. Following Pesaran and Pesaran (1997) procedure, we estimated ARDL with Wald test (F-statistics) to test for joint (overall) significance of the co-efficient of all the variables in the model.

Table 4.3: Critical Lower and Upper Bound Values at various level of significance

| Significance Levels | Lower Bound I (0) | Upper Bound I (1) |
|---|---|---|
| 10% | 2.03 | 3.13 |
| 5% | 2.32 | 3.50 |

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| | | |
|---|---|---|
| 2.5% | 2.60 | 3.84 |
| 1% | 2.96 | 4.26 |

Source: Researchers' compilation (2024).

The decision rule is that if the computed F-statistics exceeds the upper bound value I (1), then the null hypothesis is rejected which indicates that there is co-integration. Otherwise, if computed F-statistics falls below the lower bound value I (0), the null hypothesis of no co-integration is accepted. If the computed result falls between the lower and upper bound values, the test is inconclusive. The test for the enquiry about the existence of long run relationship among the variables in the model is represented in Table 4.4.

Table 4.4: Long-Run Result for the study periods

| Equation: ARDL Bounds Test | | |
|---|---|---|
| Test Statistic | Value | K |
| F-statistic for pre- SAP period | 7.039273 | 7 |
| F-statistic for SAP period | 12.36043 | 7 |

Source: Researchers' compilation (2024).

The table 4.4 reveals that F-statistics was 7.039273and 12.36043 respectively for the both Pre-SAP and SAP periods and both exceeds the upper bound values at 1 per cent, 2.5 per cent, 5 per cent and 10 per cent critical value. This implies that there is evidence of co-integration and the presence of sustained long run relationship among the variables in the model. The further investigation into the research would therefore be based on short-run analysis of ARDL to determine the dynamic relationships.

**4.3 To achieve the first objective**

This is to determine the impact government spending on infrastructure has on Nigeria's economic growth during the pre-SAP period, ARDL Test was conducted for the pre- SAP period

Table 4.5: Short-Run Dynamic Analysis for the pre-SAP period

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 105.58408 | 36.42368 | 2.895131 | 0.4348 |
| LOG ((GDPGR (-1)) | 21.648009 | 2.908612 | 7.443479 | 0.0004 |
| LOG(TRANSGR) | 11.225555 | 2.463486 | 4.555102 | 0.0006 |
| LOG(COMMGR) | 13.999752 | 2.269477 | -6.065496 | 0.0009 |
| LOG(HTHGR) | 2.587632 | 1.479019 | 1.765575 | 0.0757 |
| LOG(EDUGR) | 3.099085 | 1.129467 | -2.678548 | 0.0531 |
| DLOG((UTLGR,1)) | 5.348965 | 1.117715 | -4.760009 | 0.0051 |
| ECMPRSAP (-1) | -15.298074 | 2.240103 | -6.773939 | 0.0013 |

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| | | | | |
|---|---|---|---|---|
| R-squared | 0.680172 | | | |
| Adjusted R-squared | 0.539441 | | | |
| F-statistic | 6.945191 | | | |
| Prob. (F-statistic) | 0.009437 | | | |
| Durbin-Watson stat | 1.792935 | | | |

Source: Researchers' compilation (2024).

From the above short run analysis in Table 4.5, we observed that the constant term is given as 105.58408 which indicates that if all the independent variables are held constant, GDPGR increased on average by 106 per cent during the period. The variable is also insignificant as its probability value is greater than 0.05 (0.4348).

The coefficient of $GDPGR_{-1}$ (21.648009) has a positive impact on economic growth which shows that a per cent increase in the growth rate of past GDP growth rate leads to an increase in expected economic growth by 21.6 per cent on average. This agrees with the a-priori expectation as no nation can witness economic growth in the current period without its previous economic performance. This variable is also significant which means that the role of previous economic performance (the lagged value) should not be ignored in promoting economic growth in the economy.

The coefficient of government spending on the transport sector (11.225555) has a positive impact on GDPGR of the country during the pre- SAP period. This simply means that a per cent increase in the growth rate of government spending on the transport sector in the economy leads to an increase in growth of the economy to about 11.2 per cent. This supports the a priori expectations. The fact remains that transport infrastructure needs cut across sectors and is central to economic growth and development. This variable is also significant as its probability value is 0.0006 meaning that the role of government spending on the transport sector was well acknowledged in promoting economic growth during the period.

We also observed that government spending on the communication sector COMM has a positive impact on economic growth in Nigeria. Precisely, a per cent increase in the growth rate of government spending in COMM leads to 14 per cent increase in economic growth in Nigeria during the period. This is understandable since the importance of communication was not as sophisticated as it is in recent times. This variable supports the a priori predicted sign of positive and is significant at 5 per cent significance level with a probability value of 0.0009. This means that government spending on the communication sector significantly increased economic growth in Nigeria during the period.

The coefficient of government spending on the health sector HTH is 2.587632. This implies that a per cent increase in the growth rate of government spending in HTH variable results in a 2.59 per cent increase in Nigeria's GDPGR. This is in line with the a priori expectations. This variable is also found to be statistically insignificant at 0.05 per cent levels of significance judging from the slightly high probability value estimate of 0.0757. The implication of this finding is that during the pre- SAP period, the government spending in Nigeria's health sector has not brought about the proposed growth in the economy which it has the potentials not minding government investment on it.

The estimated coefficient of government spending on the education sector EDU is found to be 3.099085. Thus, a direct relationship with GDPGR is established during the period. This is consistent with the a-priori expectation because providing education services to people is one of the major ways of improving the quality of human capital and no country has achieved sustained economic development without substantial investment in education. The variable is also significant at 0.05 per cent levels of significance with a probability of 0.0531. The implication of this is that the education sector is a vital ingredient to the economic growth of the Nigerian economy even in the short run.

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The government spending on the utility sector (UTL) coefficient bears a positive sign. With the value of the coefficient as 5.348965 means that a per cent increase in growth rate of government spending on the utility sector leads to about 5.35 per cent increase in GDPGR on average. This is in line with the a-priori expectation but was significant at 5 per cent significance level which was confirmed by the probability value of 0.0051. This means that there is a positive significant impact of utility sector on economic growth in the short run during the pre-SAP period and it is attributable to poor emphasis laid on the water resource sector in the country at the period when compared to the scenario in recent times.

The coefficient of error correction mechanism (ECM) is negative -15.298074 and significant at 0.05 per cent critical level as evident by the low probability value of 0.0013. This shows that about 153 per cent speed of adjustment is needed to correct the disequilibrium in Nigeria's GDPGR in the previous year in the current year. The significance of the ECM is an indication and a confirmation of the existence of a long-run equilibrium relationship between the value of GDPGR and all the explanatory variables in the model. This is indicated in the Wald Bounds test and also reveals that the variables are co-integrated.

**4.4 To achieve the second objective**

This is to determine the impact government spending on infrastructure has on Nigeria's economic growth during the SAP period, ARDL Test was conducted for the SAP period

Table 4.6: Short-Run Dynamic Analysis for the SAP period

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 3.153336 | 1.095399 | -2.878710 | 0.0109 |
| LOG ((GDPGR (-1)) | 34.98542 | 14.40838 | -2.428130 | 0.0273 |
| DLOG(TRANSGR,1) | 4.331397 | 1.939571 | -2.268479 | 0.0375 |
| DLOG(COMMGR,1) | 2.587111 | 1.154181 | 2.241512 | 0.0395 |
| DLOG(HTHGR,1) | 0.445643 | 0.311501 | 1.407275 | 0.1785 |
| DLOG(EDUGR,1) | 4.358202 | 1.401561 | 3.181997 | 0.0444 |
| LOG(UTLGR) | 7.822980 | 2.383023 | -3.305837 | 0.0537 |
| ECMSAP (-1) | -2.811994 | 1.176183 | -2.390779 | 0.0295 |
| R-squared | 0.844323 | | | |
| F-statistic | 5.033840 | | | |
| Prob. (F-statistic) | 0.000092 | | | |
| Durbin-Watson stat | 1.944470 | | | |

Source: Researchers' compilation (2024).

From the above short run analysis in Table 4.6, we observed that the constant term is given as 3.153336 which indicates that if all the independent variables are held constant, GDPGR increased on average by 3.15 per cent during the SAP period. The variable is also significant as its probability value is less than 0.05 (0.0109).

The coefficient of $GDPGR_{-1}$ (34.98542) has a positive impact on economic growth which shows that a per cent increase in the growth rate of past GDP growth rate leads to an increase in expected economic growth by 34.9

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per cent on average. This agrees with the a-priori expectation as no nation can witness economic growth in the current period without its previous economic performance. This variable is also significant which means that the role of previous economic performance (the lagged value) should not be ignored in promoting economic growth in the economy.

The coefficient of government spending on the transport sector (4.331397) has a positive impact on GDPGR of

the country during the SAP period. This simply means that a per cent increase in the growth rate of government spending on the transport sector in the economy leads to an increase in growth of the economy to about 4.3 per cent. This supports the a priori expectations. The fact remains that transport infrastructure needs cut across sectors and is central to economic growth and development. This variable is also significant as its probability value is 0.0375 meaning that the role of government spending on the transport sector was well acknowledged in promoting economic growth during the period.

We also observed that government spending on the communication sector COMM has a positive impact on economic growth in Nigeria. Precisely, a per cent increase in the growth rate of government spending in COMM leads to 2.6 per cent increase in economic growth in Nigeria during the SAP period. This is understandable since the importance of communication was not as sophisticated as it is in recent times. This variable supports the a priori predicted sign of positive and is significant at 5 per cent significance level with a probability value of 0.0395. This means that government spending on the communication sector significantly increased economic growth in Nigeria during the period.

The coefficient of government spending on the health sector HTH is 0.445643. This implies that a per cent increase in the growth rate of government spending in HTH variable results in a 0.44 per cent increase in Nigeria's GDPGR. This is in line with the a priori expectations. This variable is also found to be statistically insignificant at 0.05 per cent levels of significance judging from the slightly high probability value estimate of 0.1785. The implication of this finding is that during the SAP period, the government spending in Nigeria's health sector has not brought about the proposed growth in the economy which it has the potentials not minding government investment on it.

The estimated coefficient of government spending on the education sector EDU is found to be 4.358202. Thus, a direct relationship with GDPGR is established during the SAP period. This is consistent with the a-priori expectation because providing education services to people is one of the major ways of improving the quality of human capital and no country has achieved sustained economic development without substantial investment in education. The variable is also significant at 0.05 per cent levels of significance with a probability of 0.0444. The implication of this is that the education sector is a vital ingredient to the economic growth of the Nigerian economy even in the short run.

The government spending on the utility sector (UTL) coefficient bears a positive sign. With the value of the coefficient as 7.822980 means that a per cent increase in growth rate of government spending on the utility sector leads to about 7.82 per cent increase in GDPGR on average. This is in line with the a-priori expectation but was significant at 5 per cent significance level which was confirmed by the probability value of 0.0537. This means that there is a positive significant impact of utility sector on economic growth in the short run during the SAP period and it is attributable to poor emphasis laid on the water resource sector in the country at the period when compared to the scenario in recent times.

Of particular interest is the ECM. The coefficient of error correction mechanism (ECM) is negative -2.811994 and significant at 0.05 per cent critical level as evident by the low probability value of 0.0295. This shows that about 28 per cent speed of adjustment is needed to correct the disequilibrium in Nigeria's GDPGR in the previous year in the current year. The significance of the ECM is an indication and a confirmation of the existence of a long-run equilibrium relationship between the value of GDPGR and all the explanatory variables in the model. This is indicated in the Wald Bounds test and also reveals that the variables are co-integrated.

### 4.6 To achieve the third objective

This is a comparism of the outcome of the first and second objectives and also introducing the period after

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SAP in Nigeria in order to have a clearer analysis with sharper outcomes. This analysis is best presented in a tabular form

Table 4.7 Summary of the short run dynamic analysis employed in the study

| Variables | 1970 - 1985 Pre-SAP | 1986 - 1998 SAP | 1999 - 2022 Post-SAP | |
|---|---|---|---|---|
| GDPGR | **21.648009*** ** | **34.98542*** ** | **0.632766** | |
| | (2.908612) | (14.40838) | (0.962194) | |
| | [7.443479] | [-2.428130] | [0.658668] | |
| TRANSGR | **11.225555*** ** | **4.331397*** ** | **-0.010461** | |
| | (2.463486) | (1.939571) | (0.008389) | |
| | [4.555102] | [-2.268479] | [-1.246935] | |
| COMMGR | **13.999752*** ** | **2.587111*** ** | **0.001677** | |
| | (2.269477) | (1.154181) | (0.011184) | |
| | [-6.065496] | [2.241512] | [0.149942] | |
| HTHGR | **2.587632** | **0.445643** | **-0.018959** | |
| | (1.479019) | (0.311501) | (0.030386) | |
| | [1.765575] | [1.407275] | [-0.623929] | |
| EDUGR | **3.099085*** ** | **4.358202*** ** | **-0.000719** | |
| | (1.129467) | (1.401561) | (0.001793) | |
| | [-2.678548] | [3.181997] | [-0.456804] | |
| UTLGR | **5.348965*** ** | **7.822980*** ** | **0.000313** | |
| | (1.117715) | (2.383023) | (0.000556) | |
| | [-4.760009] | [-3.305837] | [0.562570] | |

| Observation | 16 | 13 | 21 |
|---|---|---|---|
| R-Square | 0.680172 | 0.844323 | 0.63321 |
| F-Stat | 6.945191 | 7.033840 | 1.150936 |
| DW | 1.792935 | 1.944470 | 1.894911 |

**Note*** denotes significance at 5%, standard error in () and t-statistics in []**

Source: Researchers' computation using Eview

From Table 4.7, growth rate of government spending on transport, communication, education and utility sectors have significant positive impact on economic growth during the pre-SAP period. The growth rate of government spending on the health sector has a positive insignificant impact on economic growth in Nigeria. The same scenario repeated itself during the SAP period but in this case, it is the growth rate of government spending on the health sector once again that has a positive insignificant impact on economic growth in Nigeria. This means that government spending for infrastructure was judiciously utilised to cause economic

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growth in Nigeria during the periods. The opposite becomes the case to cover from the post-SAP period till date. In this case, government spending on transport, communication, health, education and utility sectors all have insignificant impact on economic growth. While growth rate of government spending on communication and utility sectors have positive impact, growth rate of government spending on transport, health and education sectors have negative impact on economic growth in Nigeria. This invariably means that the performance of the Nigerian economy worsened after the implementation of the SAP policy especially the transport, health and education sectors. The result is regime dependent. The most appalling situation in the post-SAP period is that it incorporated various other economic policies like petroleum special trust fund, national economic empowerment development strategy and poverty eradication programs. With all the government spending on transport, communication, health, education and utility sectors to implement the policies, we only witnessed negative and insignificant impact of government spending on these sectors on economic growth. Since the outcome achieved before and during the SAP period was not sustained within the country afterwards, this paper concludes that the introduction of SAP in Nigeria was

## CONCLUSION AND RECOMMENDATION

From the ARDL short run analysis result for both the pre-SAP and SAP periods, we observe that there is a positive short run effect of growth rate of government spending on transportation sector, communication sector, health sector, education sector and utility sector on economic growth in Nigeria. This is also in line with the theory of unbalanced growth which is the theoretical underpinning of this study. The opposite becomes the case to cover from the post-SAP period till date not minding the periods anchored a lot more of government policies targeted at the economic development of Nigeria. This then means that the performance of the Nigerian economy worsened after the implementation of the SAP policy.

The study therefore recommends that there should also once again be a sincere incorporation of the modalities used for anchoring and implementing SAP policy in this country which ensured economic growth in the formulation and implementation of new or existing policies in the country. The government should ensure that what is annually budgeted for infrastructural development in the country is judiciously and economically spent. The government should also monitor her spending by reducing wastages so that infrastructure can contribute positively to growth in the country. Nigerian government should ensure she meets the international benchmark by World Bank that not less than ten per cent of budgetary allocation on infrastructure should be expended yearly by developing economies. Individual and corporate foreign investors should also be encouraged to participate in the infrastructural development process of the country. Finally, the composition of public spending on infrastructure must take into account the needs of the populace and not be biased by political priorities especially in the transport, health and utility sectors.

## REFERENCES

1. Abubakar, F., Yusuf,H. and Abdulmalik, T. (2020). Impact of government expenditure on agricultural growth in Nigeria: An empirical evidence. International Journal of Intellectual Discourse, 3(1), pp 34-43.
2. African Economic Outlook. (2016). Entrepreneurship and industrialization. Journal of African Development Bank, 24, No. 3, 112-116.
3. Amadi K. C. and Alolote I. A. (2020). Government expenditure on infrastructure as a driver for economic growth in Nigeria, Journal of International Business Research and Marketing, 5(2), 20-26.
4. Awode S. (2019). The rising government expenditure in Nigeria: any influence on growth? European Journal of Applied Economics, 16(2), 95-108.
5. Azolibe, B., Okonkwo, J. and Adigwe, P. (2020). Government infrastructure expenditure and investment drive in an emerging market economy: evidence from Nigeria, Sage Journals, 6(1), 24-33.
6. Babatunde S.A. (2018). Government spending on infrastructure and economic growth in Nigeria. Economic Research Journal, 31(1), 997 – 1014.
7. Buari, a., Alexander,A., Saheed, Z. and Alfa, Y. (2020). Impact of government expenditures in agriculture and education on economic growth in Nigeria: a disaggregated analysis. International Journal of Innovative Finance and Economics Research 8(1), 177-188.

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8. Central Bank of Nigeria (2016). Annual Report and Statement of Accounts bulletin. Abuja.
9. Central Bank of Nigeria (2020). Annual Report and Statement of Accounts bulletin. Abuja.
10. Deng, J.E. (2013). The impact of infrastructure capital on the private sector of the Netherlands: An application of the symmetric generalized McFadden cost function research memorandum. The Hague Netherlands Bureau for Economic Policy Analysis, 11, 67-87.
11. Dewett, J. (2005). The use of ARDL approach in estimating virtual exchange rates in India. Journal of Applied Statistics, 11, 573-583.
12. Edame, G. and Fonta W. (2014). The impact of government expenditure on infrastructure in Nigeria: A Co-integration and Error Correction Specification, International Journal of African and Asian Studies, 2(1), 14-19.
13. Juliet Elu (2000). The Impact of Ten Years of IMF (SAP) Reform: The Case of Sub-Saharan Africa (SSA), World Studies in Education, 1(1), 41-59.
14. Hirschman A. (1958). The Strategy of Economic Development, latin America: Universidade de Sao Paulo.
15. Iorja, G. and Isa, G. (2020). Infrastructure and sustainable economic diversification in Nigeria. Global Journal of Accounting and Economy Research, 1(2), 145-160.
16. Kolawole B. (2020), Government expenditure and infrastructure development in Nigeria, Journal of Economic Studies, 17(1), 20-25.
17. National Bureau of Statistics. (2021). Nigerian gross domestic report (expenditure and income approach). https://www.nigerianstat.gov.sc
18. Neiman C. Y. (2012). The Association between Structural Adjustment Program Participation and the Economies of Select Sub-Saharan African Nations, Walden University Journal, 20-42.
19. Ndubueze, E.O., Okoli, U.V., Onwuka, I.N., & Mba, S.E. (2020). Impact of government expenditure on unemployment in Nigeria: Evidence from social expenditure. International Journal of Social Sciences and Management Research, 6(1), 65-76.
20. Nimenibo, A. and Samuel, W. (2020). The empirical evaluation of how public expenditure influences economic growth in Nigeria. Global Journal of Management and Business, 20(2), 45-57.
21. Nurudeen, I., Sani, S. and Adewinle, F. (2021). Relationship between growth and expenditure: an examination of wagner's law in Nigeria. International Journal of Economic Growth and Environmental Issues, 9(1), 13- 27.
22. Nwude C., Nwaeze C and Nwude C. (2023). Government expenditure and economic growth: evidence from the critical sectors in an emerging economy. Qeios Journal, 1(1), 26-40.
23. Obayori, J. and Akpan, J. (2022). Government spending in education and human development index in Nigeria, British International Journal of Education and Social Sciences, 9(6), pp 11-32.
24. Ojo, T.and Ojo, S. (2022). Health expenditure, education and economic growth in Nigeria. Open Journal of Social Science and Humanities 3(1), 01-17.
25. Pesaran, M.H; & Pesaran, B. (1997). Working with Microfit 4.0: Interactive Econometric Analysis. England: Oxford University Press.
26. Pesaran, M.H., Shin, Y., & Smith, R. J. (2001). Bounds testing approach to the analysis of level relationships. Journal of Applied Econometrics, 16(12): 289-326.