ABUAD Journal of Social and Management Sciences (AJSMS),
Vol. 5, No. 1, 2024, pages 28-46 https://doi.org/10.53982/ajsms.2024.0501.02-j

Published by the College of Social and Management Sciences (SMS), Afe Babalola University, Ado-Ekiti (ABUAD), Nigeria.
E-mail: ajsms@abuad.edu.ng

e-ISSN: 3043-4173

# Non-Linear Causal Links amongst Functional Recurrent Components of Government Spending and Nigeria's Economic Growth

David BABATUNDE[1]
Mathew E. ROTIMI[1]
Isiaka O. KOLAWOLE[1]
Olanipekun E. FALADE[2]

## Abstract

This research work examined the relationship between components of government recurrent spending and economic growth in Nigeria. Government recurrent spending is split into four categories, namely: economic services, administration, transfers and social services. The aim is to isolate and place emphasis on their individual relationship with economic growth between 1981 and 2022. Within the VAR Toda-Yamamoto specification, nonlinear causal relationships were analysed using positive and negative shocks generated from the ARDL framework. Results from the empirical finding after unit root (all of order 1) and co-integration (at least one co-integrating vector) tests were carried out and indicated that administration has a causal relationship that is unidirectional with economic expansion. Also, all the functional components of recurrent government expenditures are jointly correlated to cause economic growth in Nigeria. These outcomes depict that Nigeria needs to increase its spending on all these functional components in order to have a better and robust growth and development. Capital projects like Ajaokuta Steel and the nation's refineries should also receive priority as it will indirectly increase the causal effects of recurrent components of government spending on the Nigeria's economic growth.

**Keywords:** $K+d_{max}$, Nonlinear Causality, Recurrent Spending, Toda-Yamamoto, VAR.

[1] Department of Economics, Federal University Lokoja, Lokoja, Nigeria.
*Corresponding author's e-mail: david.babatunde@fulokoja.edu.ng*
*ORCID: https://orcid.org/0000-0002-3145-5660*

[2] Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria
*ORCID: https://orcid.org/0000-0001-9875-1352*

## I. Introduction

Over the years, government spending has remained a crucial tool in economic development. It acts as an essential instrument for the total functions of economies around the world at all levels of growth processes. Recently, several advanced and developing countries deployed their spending to redistribute and improve the level of income of their citizens, redirect resource allocations to targeted sectors and regions, and alter the compositional structure of total earnings (Aluthge, Jibril, & Abdul, 2021; Assi *et al.*, 2019). For instance, less developed nations have varied spending patterns with the expectation of not only stabilising their economies but also increasing economic growth through job creation and the prospect of limitless opportunities (World Bank, 2015). Also, twenty-first century nations have an increasing proportion of their income going for expenditure, regardless of different countries' levels of economic development (Chukwu & Udochukwu, 2019; Lindaver & Valenchik, 1992).

Government spending in Nigeria has mainly been classified into recurrent and capital spending. Recurrent spending, according to Okoro (2013), refers to the cost incurred on salary payments, administrative wages, debt servicing, etc., while capital spending includes expenditure on investment outlays such as airport construction, roads, education, health, generation of electricity, telecom, etc. Historically, past Nigerian leaders in public positions had a very good system of public service that was seen as selfless, committed, and dedicated with value judgement. A few years ago, some ineffective, unpatriotic, poor-minded, and nonchalant rulers uncontrollably mismanaged funds and resources, causing great failure in Nigeria's institutional arrangements and a decline in her financial systems and commitment. This era witnessed unprofessionalism among office holders, intense party affiliation, and an all-encompassing prevalence of corruption, stagnation, and retrogression, as well as greed for self-interest (Zakari & Button, 2022; Tade, 2019). Moreover, Nigeria's ranking among resource-rich nations is concerning due to poor access to basic education, potable water, electricity, infrastructure, security, and job creation, despite large public earnings allocated to development programmes and projects (Olayungbo, 2019).

It must be noted that various administrations in Nigeria, over the years, have deployed and rolled out a series of programmes and spending plans to boost economic growth. These programmes include the Structural Adjustment Programme (SAP), Agricultural Development Project (ADP), Seven Point Agenda, Vision 2010, Vision 2020, Change Mantra, and now the Subsidy and the Salary Award of N35,000, which are all targeted at eliminating poverty, crime, conflicts, illiteracy levels, and improving citizens' life expectancy. Paradoxically, apart from recorded dwindling growth, these measures, in addition, ended up having a declining life expectancy rate of 54.33 years in 2018 (Onwube *et al.*, 2021), with a rate of illiteracy at 38% (Nigeria

Tribune, 2021, September 7). Given these circumstances, it is inimical to know if government spending has previously been consistent with the degree to which economic growth is recorded in Nigeria.

A useful rule of thumb suggested in past empirical research regarding the connections among government spending and GDP, specifically in growing economies like Nigeria, presents conflicting views. One strand suggests a negative effect (Falade & Babatunde, 2020; Gukat & Ogboru, 2017), and another strand of literature establishes that government spending and its compositions do not promote output growth and development and therefore have no causal link to GDP (Ahuja & Panda, 2020; Jibir & Aluthge, 2019a; Olayungbo & Olayemi, 2018). These conflicting literatures can be the result of variances in either the scope, methods, or data frequencies. These conflicting literatures can be the result of differences in scope, methods, or data frequencies.

Most literatures in the past basically split government spending into capital and recurrent without necessarily considering the individual effects of the functional components especially for the recurrent spending.

Additionally, this research paper is unique as it captures more data period between 1981 and 2022 compared to other studies in this area. Also, the research methodically analyse non-linear connection among the variables using data series (positive and negative sums) generated from the ARDL framework to analyse nonlinear causal links in the VAR framework using the Toda-Yamamoto specification. There is yet few studies that looked at the non-linear link between the functional components of recurrent government spending and GDP in Nigeria.

Keeping these perspectives in mind, this research empirically investigates the relationships between the functional components of recurrent government spending and Nigeria's GDP using the non-linear specification of the Toda-Yamamoto VAR approach. Particularly, to pay attention to the non-linear links that each of these components has on growth and determining their causal relationship with Nigeria's economy.

Other parts of this research work are structured into four sections: literature reviews, methodology, data presentation and interpretation, and summary and conclusion resulting from the study's findings.

## II. Literature Review

Based on the endogenous growth models, the precise form of the influence of financial strategy measures on growth can be determined, as asserted by Builter

(1977), through the kind of policy instrument deployed (either distortionary or non-distortionary). The influence of public spending on growth, as postulated by the Keynesian-formed premise that guided this research, Keynes (1936) postulated (following the 1930s Great Depression) that government expenditure is influenced by a nation's growth target and a policy variable that might encourage economic expansion and development (Obi, 2020; Antonis, Constantinos, & Persefoni, 2013). Wagner (1876) hypothesised that government spending is an endogenous variable, but Ampah & Kotosz (2016) and Thabane & Lebina (2016) show that this is not the case.

Since the 1930s, the field of economics has undergone significant modification and innovation resulting from the advocacy for government participation in economic management. Sensitive economic metrics, including investments, job creation, and overall demands for government spending, have increased significantly during these years (Falade & Babatunde, 2020; Chukwu & Udochukwu, 2019; Musgrave & Musgrave, 1989).

Many researchers have empirically investigated government spending's influence on economic expansion and advancement. For instance, Katrakilidis and Tsaliki (2009) showed a long-term equilibrium connection between public spending and output in Greece between 1958 and 2004. Equally, Srinivasan (2013) analysed the connection between India's government spending and its economic growth. His findings point to a one-direction causal link coming from government spending in both shorter and longer periods. Using Italian data ranging from 1861 to 2008, Forte & Magazzino (2016) investigated the interaction between government spending and output. Their findings demonstrated a non-linear impact between government spending and economic output. Also, Churchill, Ugur, and Yew's (2016) investigation into the connection between output growth and public spending supported the widely held notion that large-scale government spending is bad for growth. Meanwhile, on the contrary, Diyoke, Yusuf, and Demirbas's (2017) studies indicated an established positive connection between government expenditure and economic expansion.

Iheanacho (2016) divided total government spending into two categories: recurrent and capital. His research demonstrated a short-term correlation between growth and public recurrent spending. As a result, public recurrent spending is a key driver of Nigeria's growth. In a related study, Lim (1983) looked into economic growth in less developed nations (LDCs) and showed that in LDCs, public recurrent spending rises gradually and affects growth.

Obi (2020) examined how government recurrent spending affected economic growth in Nigeria through economic services, transfers, community services, and social services. The validity of each of these chosen variables was assessed by adopting the VECM methodology with further preliminary tests in his investigation. His research's conclusions demonstrate that the Nigerian economy is not driven by social, community, or economic services. In a similar spirit, Aluthge*et al.* (2021) used the ARDL Bounds Testing approach to examine the effect of government spending on economic growth between 1970 and 2019. According to their findings, ongoing spending has no appreciable influence on economic growth over longer or nearer periods.

Falade & Babatunde (2020) broke down government spending into functional components of capital and recurrent (social service, transfer administration, and economic service) in order to investigate the degree of poverty and unemployment in Nigeria from 1980 to 2017. Using the ARDL methodology, their findings support the notable variability in the ways that various public expenditure components affect unemployment and poverty. Their discoveries showed that the capital expenses of the government on social and administrative matters do not have any discernible direct link to poverty; instead, they may be used to lower unemployment. However, capital spending on social and economic services can help alleviate poverty. Additionally, their estimated results demonstrated no correlation between poverty and any of the functional recurrent spending components.

Using the VECM method to analyse government expenditure's effects on GDP in South Africa between 1990 and 2015, Molefe & Choga (2017) observed a long-term negative connection between government spending and GDP. Using data specific to Kuwait in a similar study by Ebaid and Bahari (2019), a unidirectional causal link between spending and economic development was noted. Furthermore, Olayungbo and Olayemi (2018) observed a negative and substantial influence of public spending on GDP when they employed the VECM method on annual data from Nigeria between 1981 and 2015. Wagner's law and neoclassical growth models are neither supported nor refuted by the ARDL model when taking structural breaks into consideration. This is controversial because the research was conducted in underdeveloped nations that are struggling with corruption and bribery.

Similar findings were made by Onifade *et al.* (2020). They used the ARDL methodology with data from 1981 to 2017 in Nigeria and found that capital investment somewhat increases GDP, but recurrent spending has a negative influence on national growth. Their results supported the endogenous model in Barro's claims (1990), which state that productive expenditures may increase output levels in the short and long term. Additionally, Ebong *et al.* (2016) employed VECM in the study of the effects of government spending (through recurrent and capital) on Nigeria's GDP between a long-term period of 1970 and 2012. The result shows that infrastructure spending has a positive and large influence on the GDP over shorter and longer periods of time.

Yasin (2003) investigated and found that spending by the government largely favours economic growth when analysing the relationship between government spending and Sub-Saharan Africa's growth. He also finds that both private investment spending and trade openness significantly boost economic expansion in sub-Saharan Africa.

Equally, Atilgan, Kilic, and Ertugrul (2017) displayed a favourable association between social spending (on health) and economic expansion. Babatunde (2018) found no variation in the significant and favourable influence of transportation, communication, education, and health spending on Nigeria's growth. Furthermore, Usman *et al.* (2011) used a time-series multivariate approach to examine how public spending affects output growth in Nigeria. Their findings indicated that short-term economic expansion is influenced in the opposite direction by expenditures on education, transportation, administration, and communication. Equally, the cointegration result revealed an existing long-term correlation between public spending and output growth. Furthermore, Gukat and Ogboru (2017) discovered in another disaggregated analysis that spending on community and administrative services has detrimental effects on growth.

Akanbi (2014) exploited estimates of time-series data spanning between 1974 and 2012 by employing Johansen techniques of estimation and a public choice framework to explore the drivers and patterns of public spending in Nigeria. His findings demonstrate resilience in capital and recurring expenditure to fluctuations in the sums of government expenditure and a sign of another resilience when the process is reversed.

In another dimension, the results of past empirical research on the contribution of recurrent public spending to Nigeria's GDP have been shown to be limited by challenges related to measurement, econometrics, and time scope. According to Folster & Henrekson (2001), there are significant econometric and measurement issues with much of the earlier research in this area of discipline. It makes sense if these issues are resolved, as it could lead to significant advancements in understanding the links among components of functional government recurrent spending and GDP.

## III. Methodology:

### *Data*

The connection between functional recurrent public spending and economic growth between 1981 and 2022 is analysed in Nigeria through yearly time series data. This research's analysis relied on secondary data sourced from the Statistical Bulletin of the National Bureau of Statistics (NBS, 2023) and the Central Bank of Nigeria (CBN, 2023). The data are measured based on pertinent factors, including the variations in impact of the four parts of recurrent government spending on: transfers (TGRE), administration (AGRE), economic services (EGRE), and social services (SGRE). GDPP stands for gross domestic product per capita, which indicates economic growth. Data period selection is premised on the significance of the period in relation to the study, as it spans periods of major fluctuations in the Nigerian government's recurrent spending. Also, the data period was chosen because of its accessibility, specifically because it covers periods when the records for functional government spending began in Nigeria.

The a priori expectation of these data sets, based on existing theories, is that government spending is predicted to have a multiplier effect on the economy, leading to a greater than proportional increase in GDP as businesses and consumers continue to spend.

### *Theoretical Framework*

Based on the research conducted by Falade & Babatunde (2020), Chukwu & Udochukwu (2019), and Musgrave & Musgrave (1989), the study embraces Keynesian theories, which suggest that fiscal expansion increases output and aggregate demand, hence boosting economic growth. Over time, economists, particularly those in university settings, have carried out a wide range of empirical studies of the Keynesian public expenditure-economic growth theory. Keynesians predict a function whose orientation ranges from government project expansion to economic advancement. In the perspective of society, these expenses are seen as typical products with an income elasticity of demand greater than one. Keynes argued that in order to boost employment and income levels during recessions and depressions, the government should continuously maintain a budget deficit. The late 1930s Great Depression marked the turning point at which the Keynesian postulate developed a significant advancement in the science of economics, bringing about advocacy for government participation in economic management.

In his analysis of the government's involvement in income stabilisation, Keynes looked at the budget as a tool for influencing the economy. To begin with, a closed economy's total demand is conventionally expressed mathematically as: $AD = C + I + G$ (3.1).

where consumption is represented by C, I indicated investment, while government spending is denoted by G. Government spending is undoubtedly a boost to total demand. Thus, if everything else remains the same, an increase in government spending will expand revenue. As a result, reducing government spending will equate to a decline in revenue.

### *Model Specification and Techniques of Analysis*

This study examines the nexus between economic growth and components of government recurrent spending, with a particular emphasis on identifying the direction of causation and the effects of the causative variables on the explained parameter. This investigation necessitates three easy procedures. To determine integration order, the unit root test was first conducted through the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) methods. Secondly, the cointegrating vectors of the series were ascertained by determining the relationship of long-term equilibrium between them. Lastly, consideration was given to identifying the causative variables effects on the variable that was explained. Recurrent government expenditures can be divided into four categories: transfers, social services, administration, and economic services. Economic growth was analysed using GDP per capita.

It is not uncommon in econometrics analysis to have models with certain variables that explain not just dependent variables but are themselves explained by the same variables that they help in determining. Certain situations could warrant having simultaneous equation models where it is imperative to distinguish between the endogenous and exogenous (or predefined) variables. Sims (1980) strongly doubted the decision about such a distinction among variables. When several variables occur simultaneously, Sims (1980) argues that those variables should be handled equitably. The development of the VAR models is based on the fact that each equation has regressor sets that are identical in their general reduced form. Aside from deterministic regressors, VAR models only use their own historical data to explain the endogenous variables themselves.

Further guidance in defining the model of a dynamic causal relationship among variables is provided by the integration order and evidence of cointegration. In the absence of cointegration, Granger causality is specified with VAR. According to this assumption, a series' integration sequence differs. As a result, in order to examine the causal link amongst components of recurrent public spending and GDP in Nigeria, this research uses the Toda-Yamamoto methodology as specified in the work of

Babatunde *et al.* (2019) and Dritsaki (2017). No matter in which order the variables' cointegration occurs, the Toda Yamamoto (1995) technique can be applied to level VARs. Even when the VAR system is not cointegrated, the Wald test (statistical inference) methodology allows for differences in integration order.

By specifying $\text{VAR}(k+d_{\max})$ and using an enhanced Wald statistic to estimate parameters, equations 3.1 to 3.5 are formed, where the system's optimal lag, denoted with k, represents the highest order of integration. The causality test procedure assures the distribution of chi-square's asymptotic Wald test statistic. This strategy works as long as the ideal lag is not exceeded by the integration's highest order.

Thus:

$$\Delta gdpp_t = \hbar_1 + \sum_{i=1}^{k} \vartheta_{1i}\Delta gdpp_{t-i} + \sum_{j=k+1}^{d_{\max}} \vartheta_{2j}\Delta gdpp_{t-j} + \sum_{i=1}^{k} \tau_{1i}\Delta erge_{t-i} + \sum_{j=k+1}^{d_{\max}} \tau_{2j}\Delta erge_{t-j} + \sum_{i=1}^{k} \alpha_{1i}\Delta arge_{t-i} + \sum_{j=k+1}^{d_{\max}} \alpha_{2j}\Delta arge_{t-j} + \sum_{i=1}^{k} \beta_{1i}\Delta srge_{t-i} + \sum_{j=k+1}^{d_{\max}} \beta_{2j}\Delta srge_{t-j} + \sum_{i=1}^{k} \ell_{1i}\Delta trge_{t-i} + \sum_{j=k+1}^{d_{\max}} \ell_{2j}\Delta trge_{t-j} + \varepsilon_{1t} \quad (3.1)$$

$$\Delta erge_t = \hbar_2 + \sum_{i=1}^{k} \kappa_{1i}\Delta erge_{t-i} + \sum_{j=k+1}^{d_{\max}} \kappa_{2j}\Delta erge_{t-j} + \sum_{i=1}^{k} \phi_{1i}\Delta gdpp_{t-i} + \sum_{j=k+1}^{d_{\max}} \phi_{2i}\Delta gdpp_{t-j} + \sum_{i=1}^{k} q_{1i}\Delta arge_{t-i} + \sum_{j=k+1}^{d_{\max}} q_{2j}\Delta arge_{t-j} + \sum_{i=1}^{k} z_{1i}\Delta srge_{t-i} + \sum_{j=k+1}^{d_{\max}} z_{2j}\Delta srge_{t-j} + \sum_{i=1}^{k} p_{1i}\Delta trge_{t-i} + \sum_{j=k+1}^{d_{\max}} p_{2j}\Delta trge_{t-j} + \varepsilon_{2t} \quad (3.2)$$

$$\Delta arge_t = \hbar_3 + \sum_{i=1}^{k} \chi_{1i}\Delta arge_{t-i} + \sum_{j=k+1}^{d_{\max}} \chi_{2j}\Delta arge_{t-j} + \sum_{i=1}^{k} \omega_{1i}\Delta gdpp_{t-i} + \sum_{j=k+1}^{d_{\max}} \omega_{2i}\Delta gdpp_{t-j} + \sum_{i=1}^{k} \varpi_{1i}\Delta erge_{t-i} + \sum_{j=k+1}^{d_{\max}} \varpi_{2j}\Delta erge_{t-j} + \sum_{i=1}^{k} \psi_{1i}\Delta srge_{t-i} + \sum_{j=k+1}^{d_{\max}} \psi_{2j}\Delta srge_{t-j} + \sum_{i=1}^{k} \upsilon_{1i}\Delta trge_{t-i} + \sum_{j=k+1}^{d_{\max}} \upsilon_{2j}\Delta trge_{t-j} + \varepsilon_{3t} \quad (3.3)$$

$$\Delta srge_t = \hbar_4 + \sum_{i=1}^{k} \sigma_{1i}\Delta srge_{t-i} + \sum_{j=k+1}^{d_{\max}} \sigma_{2j}\Delta srge_{t-j} + \sum_{i=1}^{k} \delta_{1i}\Delta gdpp_{t-i} + \sum_{j=k+1}^{d_{\max}} \delta_{2i}\Delta gdpp_{t-j} + \sum_{i=1}^{k} \partial_{1i}\Delta erge_{t-i} + \sum_{j=k+1}^{d_{\max}} \partial_{2j}\Delta erge_{t-j} + \sum_{i=1}^{k} \eta_{1i}\Delta arge_{t-i} + \sum_{j=k+1}^{d_{\max}} \eta_{2j}\Delta arge_{t-j} + \sum_{i=1}^{k} \mu_{1i}\Delta trge_{t-i} + \sum_{j=k+1}^{d_{\max}} \mu_{2j}\Delta trge_{t-j} + \varepsilon_{4t} \quad (3.4)$$

$$\Delta trge_t = \hbar_5 + \sum_{i=1}^{k} \lambda_{1i}\Delta trge_{t-i} + \sum_{j=k+1}^{d_{\max}} \lambda_{2j}\Delta trge_{t-j} + \sum_{i=1}^{k} \lambda_{1i}\Delta gdpp_{t-i} + \sum_{j=k+1}^{d_{\max}} \lambda_{2i}\Delta gdpp_{t-j} + \sum_{i=1}^{k} \Upsilon_{1i}\Delta erge_{t-i} + \sum_{j=k+1}^{d_{\max}} \Upsilon_{2j}\Delta erge_{t-j} + \sum_{i=1}^{k} \gamma_{1i}\Delta arge_{t-i} + \sum_{j=k+1}^{d_{\max}} \gamma_{2j}\Delta arge_{t-j} + \sum_{i=1}^{k} h_{1i}\Delta srge_{t-i} + \sum_{j=k+1}^{d_{\max}} h_{2j}\Delta srge_{t-j} + \varepsilon_{5t} \quad (3.5)$$

Where *erge, arge, srge and trge* denotes recurrent functional government spending on economic services, administration, social services and transfers. GDP per capita is symbolized as $gdpp$. $\Delta$ represents difference operator, $\hbar_1 .......\hbar_5$ represent constant parameters in equations 3.1-3.5.

$\vartheta, \tau, \alpha, \beta,$ and $\ell$ represent parameter for $gdpp$, recurrent functional government spending, on *erge, arge, srge and trge* in equation 3.1.

$\kappa, \phi, q, z,$ and $p$ denote parameter for recurrent functional government spending on *erge, gdpp*, *arge, srge and trge* in equation 3.2.

In equation 3.3, $\chi, \omega, \varpi, \psi$ and $\upsilon$ define parameter for recurrent government spending on *arge, gdpp*, recurrent functional government spending on *erge, srge and trge*.

The parameters for recurrent functional government spending on social services, GDP per capita, and recurrent functional government spending on economic services, administration, and transfers are specified using $\sigma, \delta, \partial, \eta,$ and $\mu$ in equation 3.4.

While, in equation 3.5, $ƛ, \lambda, \Upsilon, \gamma$ and $h$ imply parameters for recurrent functional government expenditure on transfers, GDP per capita, recurrent functional public spending on economic services, administration and social services.

The short-run estimates are represented with the areas that has ∑ sign in equations 3.1 to 3.5. $\varepsilon_{kt}$ (k=1,2,3,4,5) defines a finite covariance matrix with a mean of zero and serial independence of random errors.

### *Non-Linear Causality Test*

We follow Hatemi (2012) to establish the asymmetric causality. Conducting the aforesaid procedure is assumed $z_t^+ = (z_{1t}^+, z_{2t}^+)$ and $z_t^- = (z_{1t}^-, z_{2t}^-)$. The VAR order $(\rho)$ is as follows, as seen in the following Equations 3.6 and 3.7:

$$z_t^+ = \kappa + \beta_1 z_{t-1}^+ + ..... + \beta_p z_{t-1}^+ + e_t^+ \quad (3.6)$$

$$z_t^- = \kappa + \beta_1 z_{t-1}^- + ..... + \beta_p z_{t-1}^- + e_t^- \quad (3.7)$$

Where $z_t^+$ and $z_t^-$ denote vector of positive and negative variables in 3.6 and 3.7 models. $\kappa$ represents constant vector. In the context of integrated variables analysis, the symbol $\beta$ represents parameters that need to be determined. Also $e_t^+$ and $e_t^-$ denotes positive and negative error term vectors of the cumulative changes in all the stationary variables (Umar and Dahalan, 2016).

## IV. Results Presentation and Discussion

According to the outcomes of the stationarity methods utilizing Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) tests, none of the variables stated in Table 1 indicated stationarity at level (1% critical value). This suggests that in order to prevent erroneous results, the series in our models need to be differenced. After differencing the first time (Δ), all of the series with unit root attributes exhibit stationarity.

**Table 1:** *Unit Root Result*

| Variable | ADF | | PP | Integrating Order | |
|---|---|---|---|---|---|
| | I(0) | Δ | I(0) | Δ | Order |
| **LGDPP** | -1.1240 | -4.1008*** | -0.4787 | -4.1008*** | I(1) |
| **LEGRE** | -1.3883 | -7.7197*** | -1.7866 | -8.1742*** | I(1) |
| **LAGRE** | -2.6403 | -8.1869*** | -1.8739 | -8.3741*** | I(1) |
| **LSGRE** | -2.5181 | -8.2777*** | -2.1887 | -10.491*** | I(1) |
| **LTGRE** | -1.2520 | -8.5769*** | -1.2336 | -8.5629*** | I(1) |

**Source:** Authors' computation 2023

*Notes: (***), (**), (*) denote critical levels at the 1%, 5% and 10% respectively. I(0) denotes order zero while Δ represent order one*

### *Lag Length Selection Criteria*

In analysing the relationships amongst variables of interest, criterion for optimal-lag-length was estimated using FPE, AIC, SC, HQ, and LR. This was done so as to reconcile issues related to model misspecification (parsimonious) and degree of freedom (quality of fit).

This study settles at optimal-lag-length one in Table 2. This was informed by the suggestions of all the criteria which individually, choose lag-length one.

**Table 2:** *Result for Lag Length*

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| **0** | -102.4675 | NA | 0.000148 | 5.373375 | 5.584485 | 5.449706 |
| **1** | 57.27459 | 271.5616* | 1.78e-07* | -1.363730* | -0.097070* | -0.905745* |
| **2** | 82.02490 | 35.88795 | 1.92e-07 | -1.351245 | 0.970964 | -0.511607 |

**Source:** Authors' computation 2023.

*Note: lag length order selected is indicated by (*).*

### *Test for Cointegration*

To prevent over-parameterizing the co-integration results, recurrent functional government spending was separated into four parts and evaluated alongside gross domestic product so as to define their co-integration vector(s). According to Table 3 results, the cointegration test results for all variable samples indicate that at least one cointegration vector exists for both test values of Trace and Maximum Eigen, either in linear or quadratic form.

**Table 3:** *Results of Cointegration Test*

| Trend of | Type of Test | Trace | Maxi- |
|---|---|---|---|
| **None** | No Trend and Intercept | 3 | 2 |

| | | | |
|---|---|---|---|
| **None** | No Trend but Intercept | 2 | 2 |
| **Linear** | No Trend but Intercept | 1 | 1 |
| **Linear** | With Trend and Intercept | 1 | 1 |
| **Quadratic** | With Trend and Intercept | 1 | 1 |

**Source:** Authors computation 2023

### *Non-Linear Toda-Yamamoto Causality Test Amongst Components of Recurrent Functional Government Spending and Growth*

Once the order integration and lag structure between economic growth and components of recurrent functional government spending have been confirmed, the next phase is the application of the non-linear Toda-Yamamoto (TY) Granger causality approach to examine the dynamism in the variables of interest. To achieve this, positive and negative series of each component of functional recurrent government spending are generated with that of economic growth under the ARDL symmetric and asymmetric framework. These negative and positive series are then infused into the VAR Granger causality framework to analyse the nonlinear relationship. Causality tests can be performed for each variable in the linear and non-linear ARDL frameworks using the TY test, which is in accordance with the block exogeneity test of the VAR Granger causality framework. The TY technique greatly benefits Granger causality analysis because it allows for differences in the sequence of integration between variables with or without cointegrating equation(s).

The empirical test results, from the Toda-Yamamoto method to Granger causality models (in Equations 3.1 to 3.7), are reported in Table 4. The estimation result followed the Chi-square distribution with nine degrees of freedom (9 df). Findings from Table 4 results reveal that negative changes in recurrent government expenditure on administration ($LAGRE^{-}$) unidirectionally caused the positive sum of gross domestic product. Also, the positive sum in recurrent government spending on economic ($LEGRE^{+}$) and social ($LSGRE^{+}$) services, individually, caused gross domestic product to increase unidirectionally at a 10% significant level (p values of 0.073 and 0.091, respectively). Additionally, every variable in the positive changes in the LGDPP+ equation jointly correlated and caused economic growth at the 1% level of significance (p value = 0.00). These outcomes are similar to the research conducted by Arestis *et al.* (2021), which discovered a one-directional link between government spending and GDP, and Bzan *et al.* (2022), which did not discover any proof of causality in the reverse of government spending and Peru's GDP.

In the equation of the negative sum of recurrent government spending on economic services ($LEGRE^{-}$), all the variables were jointly correlated and caused $LSGRE^{-}$ at a significance level of 1% (p = 0.00). specifically, the negative changes in

Recurrent Social Services ($LSGRE^-$) have a unidirectional causality for LEGRE at the 5% critical level (p = 0.023).

The positive sum of government spending on administration ($LAGRE^+$) is jointly caused by all the varying parameters in the equation, with a p value of 0.06. Its negative sum (i.e., $LAGRE^-$) is jointly caused by all the variables in the equation at the 1% critical level (p value = 0.00). More precisely, the positive and negative changes in recurrent government spending on economic and social services ($LEGRE^-$ and $LSGRE^+$) are individually and unidirectionally significant at 1% (p value = 0.01) and cause the negative sum of government spending on administration ($LAGRE^-$), respectively. Additionally, recurrent government spending on transfers ($LTGRE^+$) granger cause $LAGRE^-$ though at a 10% significant level.

Individually, the positive sum in government spending on social services ($LSGRE^+$) is unidirectionally caused by its own negative sum at the 1% level (p = 0.00). Interestingly, at a 1% critical level (p = 0.00), every variable in the equation jointly causes $LSGRE^+$.

Finally, results show (at the 1% level with p = 0.00) a unidirectional causal link running from the negative changes in government expenditure on recurrent social services ($LSGRE^-$) and the positive sum of recurrent spending on government transfers ($LTGRE^+$). Results from these tests imply that non-linear links exist amongst all the varying components of recurrent functional government spending, which agrees with Forte and Magazzino's (2016) discovery.

**Table 4:** *Non-Linear Toda-Yamamoto Test Result*

| **Explained variable: $LGDPP^+$** | | | **Explained variable: $LGDPP^-$** | | | **Explained variable: $LEGRE^+$** | | | |
|---|---|---|---|---|---|---|---|---|---|
| Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | df |
| $LGDPP^-$ | 2.3228 | 0.1275 | $LGDPP^+$ | 0.2956 | 0.5867 | $LGDPP^+$ | 0.0270 | 0.8695 | 1 |
| $LEGRE^+$ | 3.2060* | 0.0734 | $LEGRE^+$ | 0.0007 | 0.9783 | $LGDPP^-$ | 0.0604 | 0.8059 | 1 |
| $LEGRE^-$ | 1.8396 | 0.1750 | $LEGRE^-$ | 0.0973 | 0.7550 | $LEGRE^-$ | 1.0021 | 0.3168 | 1 |
| $LAGRE^+$ | 0.0145 | 0.9039 | $LAGRE^+$ | 0.9369 | 0.3331 | $LAGRE^+$ | 0.1902 | 0.6628 | 1 |
| $LAGRE^-$ | 4.2948*** | 0.0382 | $LAGRE^-$ | 1.0700 | 0.3009 | $LAGRE^-$ | 0.8041 | 0.3699 | 1 |
| $LSGRE^+$ | 2.8621* | 0.0907 | $LSGRE^+$ | 1.9191 | 0.1660 | $LSGRE^+$ | 1.9950 | 0.1578 | 1 |
| $LSGRE^-$ | 0.9766 | 0.3230 | $LSGRE^-$ | 0.3765 | 0.5395 | $LSGRE^-$ | 0.0811 | 0.7758 | 1 |
| $LTGRE^+$ | 0.0036 | 0.9521 | $LTGRE^+$ | 2.1066 | 0.1467 | $LTGRE^+$ | 0.4637 | 0.4959 | 1 |
| $LTGRE^-$ | 0.0006 | 0.9812 | $LTGRE^-$ | 0.4310 | 0.5115 | $LTGRE^-$ | 0.9906 | 0.3196 | 1 |
| All | 43.351*** | 0.0000 | All | 7.4480 | 0.5906 | All | 5.9771 | 0.7422 | 9 |
| | | | | | | | | | |
| **Explained variable: $LEGRE^-$** | | | **Explained variable: $LAGRE^+$** | | | **Explained variable: $LAGRE^-$** | | | |
| Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | df |
| $LGDPP^+$ | 0.0581 | 0.8096 | $LGDPP^+$ | 0.3705 | 0.5427 | $LGDPP^+$ | 0.5548 | 0.4564 | 1 |
| $LGDPP^-$ | 0.0221 | 0.8819 | $LGDPP^-$ | 0.0803 | 0.7768 | $LGDPP^-$ | 0.8421 | 0.3588 | 1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LEGRE$^{+}$ | 1.9381 | 0.1639 | LEGRE$^{+}$ | 1.3106 | 0.2523 | LEGRE$^{+}$ | 0.9975 | 0.3179 | 1 |
| LAGRE$^{+}$ | 0.1844 | 0.6676 | LEGRE$^{-}$ | 1.1819 | 0.2770 | LEGRE$^{-}$ | 6.53*** | 0.0106 | 1 |
| LAGRE$^{-}$ | 0.0001 | 0.9920 | LAGRE$^{-}$ | 0.5975 | 0.4395 | LAGRE$^{+}$ | 0.0219 | 0.8824 | 1 |
| LSGRE$^{+}$ | 4.7765** | 0.0289 | LSGRE$^{+}$ | 0.9554 | 0.3283 | LSGRE$^{+}$ | 12.17*** | 0.0005 | 1 |
| LSGRE$^{-}$ | 0.1073 | 0.7432 | LSGRE$^{-}$ | 1.8146 | 0.1780 | LSGRE$^{-}$ | 0.0884 | 0.7662 | 1 |
| LTGRE$^{+}$ | 0.7236 | 0.3950 | LTGRE$^{+}$ | 0.6635 | 0.4153 | LTGRE$^{+}$ | 3.3762* | 0.0661 | 1 |
| LTGRE$^{-}$ | 0.2950 | 0.5870 | LTGRE$^{-}$ | 0.9525 | 0.3291 | LTGRE$^{-}$ | 1.2412 | 0.2652 | 1 |
| All | 39.965*** | 0.0000 | All | 16.0383 | 0.0661 | All | 70.274*** | 0.0000 | 9 |

| Explained variable: LSGRE$^{+}$ | | | Explained variable: LSGRE$^{-}$ | | | Explained variable: LTGRE$^{+}$ | | | |
|---|---|---|---|---|---|---|---|---|---|
| Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | Excluded | Chi-sq | Prob. | d.f |
| LGDPP$^{+}$ | 0.6110 | 0.4344 | LGDPP$^{+}$ | 0.0157 | 0.9003 | LGDPP$^{+}$ | 0.0051 | 0.9430 | 1 |
| LGDPP$^{-}$ | 0.3240 | 0.5692 | LGDPP$^{-}$ | 0.1492 | 0.6993 | LGDPP$^{-}$ | 2.6065 | 0.1064 | 1 |
| LEGRE$^{+}$ | 0.6755 | 0.4111 | LEGRE$^{+}$ | 2.0325 | 0.1540 | LEGRE$^{+}$ | 0.0396 | 0.8422 | 1 |
| LEGRE$^{-}$ | 0.5569 | 0.4555 | LEGRE$^{-}$ | 0.2180 | 0.6405 | LEGRE$^{-}$ | 0.1596 | 0.6895 | 1 |
| LAGRE$^{+}$ | 0.0110 | 0.9163 | LAGRE$^{+}$ | 0.4435 | 0.5054 | LAGRE$^{+}$ | 0.271 | 0.6024 | 1 |
| LAGRE$^{-}$ | 0.0425 | 0.8367 | LAGRE$^{-}$ | 0.4072 | 0.5234 | LAGRE$^{-}$ | 1.4812 | 0.2236 | 1 |
| LSGRE$^{-}$ | 11.056*** | 0.0009 | LSGRE$^{+}$ | 0.0942 | 0.7588 | LSGRE$^{+}$ | 2.7754* | 0.0957 | 1 |
| LTGRE$^{+}$ | 0.1918 | 0.6614 | LTGRE$^{+}$ | 0.8254 | 0.3636 | LSGRE$^{-}$ | 8.157*** | 0.0043 | 1 |
| LTGRE$^{-}$ | 0.0901 | 0.7640 | LTGRE$^{-}$ | 1.7074 | 0.1913 | LTGRE$^{-}$ | 0.1578 | 0.6912 | 1 |
| All | 41.426*** | 0.0000 | All | 9.24872 | 0.4147 | All | 14.777* | 0.0973 | 9 |

| Explained variable: LTGRE$^{-}$ | | | |
|---|---|---|---|
| Excluded | Chi-sq | Prob. | d. |
| LGDPP$^{+}$ | 0.0007 | 0.9795 | 1 |
| LGDPP$^{-}$ | 0.9596 | 0.3273 | 1 |
| LEGRE$^{+}$ | 0.1438 | 0.7045 | 1 |
| LEGRE$^{-}$ | 1.3473 | 0.2457 | 1 |
| LAGRE$^{+}$ | 0.3344 | 0.5631 | 1 |
| LAGRE$^{-}$ | 0.2800 | 0.5967 | 1 |
| LSGRE$^{+}$ | 2.1461 | 0.1429 | 1 |
| LTGRE$^{-}$ | 2.9143* | 0.0878 | 1 |
| LTGRE$^{-}$ | 0.3495 | 0.5544 | 1 |
| All | 8.9392 | 0.4431 | 9 |

**Source:** Compilation by the author, 2023

*Note: ***, ** and * denotes critical levels at 1%, 5% and 10% respectively while d.f. indicates the degree of freedom.*

## V. Conclusion

This research examined the causal links amongst components of recurrent functional government spending (economic service, administration, social service, and transfer) to establish if they are growth drivers within the period 1981–2022. The paper adopts the Toda-Yamamoto 1995 specification to analyse the nonlinear causal effects amongst variables of interest by generating negative and positive sums of the variables from the ARDL purview. After differentiating the first time, I(1), the order of integration indicated that all variables are stationary. The cointegration test reveals that the series has at least one co-integrating vector, implying that a long-period connection exists within variables.

The results show a unidirectional and strong causal association between recurrent government expenditures on administration and GDP. Also, all the variables jointly correlated and caused economic growth at the 1% critical level (p = 0.00) in the positive sum of the economic growth equation. These outcomes are similar to the research conducted by Arestis *et al.* (2021), which discovered a one-directional link between government spending and GDP, and Bzan *et al.* (2022), which did not discover any proof of causality in the reverse of government spending and Peru's GDP.

Additionally, unidirectional causal links exist amongst the variables in the components of recurrent government expenditure, both in the positive and negative sums. These test results demonstrate the existence of an asymmetric association amongst all components of functional government recurrent spending, which aligns with the discoveries of Falade and Babatunde (2020), Babatunde *et al.* (2019), and Forte and Magazzino (2016). Their outcomes demonstrate that, despite the possibility of no causal relationship within the parameters of linearity, there are causal relationships among the variables in the framework of non-linearity.

Based on the findings above, this research suggests that Nigeria should increase its spending on all the functional components of government spending. It is crucial, specifically, for the government to allocate a substantial amount of its income towards the enhancement of human capital and industries that engage in international trade. These sectors play a major role in driving economic growth in any nation. It is important to prioritise capital projects such as Ajaokuta Steel and the nation's refineries in order to provide employment opportunities for new graduates.

## References

Ahuja, D., & Pandit, D. (2020). Public Expenditure and Economic Growth: Evidence from the Developing Countries. *FIIB Business Review*, 2319714520938901.

Akanbi, O. A. (2014). Government expenditure in Nigeria: determinants and trends Mediterranean. *Journal of Social Sciences, 5*(27), 98-107.

Aluthge, C., Jibir, A., & Abdu, M. (2021). Impact of Government Expenditure on Economic Growth in Nigeria, 1970-2019. *CBN Journal of Applied Statistic*s. Vol. 12 No. 1. P.139-174

Ampah, I.K. &Kolosz, B. (2016). Wagner versus Keynes. The causal nexus between government expenditure and economic growth: An empirical study of Burkina Faso. *Journal of HeterodoxEconomics*. 3(2), 74-101.

Antonis, A., Constantinos, K. & Persefoni, T. (2013). Wagner's law versus Keynesian hypothesis: Evidence from pre-WWII Greece. *PanoEconomicus* 4. 457-472.

Arestis, P., Sen, H. and Kaya, A. (2021) 'On the linkage between government expenditure and output: empirics of the Keynesian view vs. Wagner's law', *Economic Change and Restructuring*, Vol. 54, pp.265–303.

Assi, R., Dimson, J. Goodman, A. & Andersen, J. S. (2019). Spending reviews: a more powerful approach to ensuring value in public finances. *Public and Social Sector Insights, London: McKinsey & Company*

Atilgan, E., Kilic, D. & Ertugrul, H. (2017). The dynamic relationship between health expenditure and economic growth: is the health-led growth hypothesis valid for Turkey? *The European Journal of Health Economics*, 18(5), 567-574

Babatunde, D., Olayeni, R. O., & Falade, O. E. (2019). Dynamic Relationship Among Oil Wealth, Capital Accumulation and Economic Growth in Nigeria. *Ife Journal of Economics and Finance (IJEF)*. Vol. 8 (March & September.

Babatunde, S. A. (2018). Government spending on infrastructure and economic growth in Nigeria. *Economic Research-EkonomskaIstra ˇzivanja*. Vol. 31(1), 997-1014.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy*, 98(5), 103-125.

Bzan, C., Quiroz, V.J.A. and Olivares, Y.M. (2022) 'Wagner's Law vs. Keynesian Hypothesis: dynamic Impacts', *Sustainability*, Vol. 14, pp.1–25.

Chukwu, A. E. & Udochukwu, G. O. (2019). Pattern of Government Recurrent Expenditure and Economic Growth in Nigeria. *International Journal of Innovative Research and Development*. Vol. 8. p.I10.

Churchill, S. A., Ugur, M., & Yew, S. L. (2017). Does government size affect per-capita income growth? A hierarchical meta-regression analysis. *Economic Record*, 93(300), 142-171.

Diyoke, K. O., Yusuf, A., &Demirbas, E. (2017). Government expenditure and economic growth in lower middle-income countries in Sub-Saharan Africa: an empirical investigation. *Asian Journal of Economics, Business and Accounting*, 5(4) 1-11.

Dritsaki, C. (2017). Toda-Yamamoto Causality Test between Inflation and Nominal Interest Rates: Evidence from Three Countries of Europe. *International Journal of Economics and Financial Issues*. 7(6), 120-129.

Ebaid, A., & Bahari, Z. (2019). The nexus between government expenditure and economic growth: evidence of the Wagner's law in Kuwait. *Review of Middle East Economics and Finance*, 15(1), 1-9.

Ebong, F., Ogwumike, F., Udongwo, U., & Ayodele, O. (2016). Impact of government expenditure on economic growth in Nigeria: a disaggregated analysis. *Asian Journal of Economics and Empirical Research*, 3(1), 113-121.

Falade, O. & Babatunde, D. (2020). Functional Government Spending, Unemployment and Poverty Reduction in Nigeria. *Journal of Economics and Development Studies*. Vol. 8. 10.15640/jeds.v8n1a9.

Folster, S. & Henrekson, M. (2001). Growth effects of government expenditure and taxation in rich countries. *European Economic Review*. Vol. 45(8), 1501-1520.

Forte, F. &Magazzino, C. (2016). Government size and economic growth in Italy: a timeseries analysis. *European Scientific Journal, 12*(7), 149-168.

Gukat, B. T., &Ogboru, I. (2017). An empirical analysis of government expenditure and economic growth in Nigeria. *Journal of Economics and Development Studies*. Vol. 5(4),122- 134.

Iheanacho, E. (2016). The contribution of government expenditure on economic growth of Nigeria: Disaggregated approach. *International Journal of Economics and Management Sciences*. doi:10.4172/2162-6359.1000369. www.omicsonline.org.

Jibir, A., & Aluthge, C. (2019a). Modelling the determinants of government expenditure in Nigeria. Cogent *Economics and Finance*. Vol. 7(1), 10.1080/23322039.2019.1620154.

Katrakilidis, C. &Tsaliki, P. (2009). Further evidence on the causal relationship between spending and economic growth: the case of Greece, 1958-2004. *ActaOeconomica*, 59(1), 57-78.

Lim, D. (1983). Government recurrent expenditure and economic growth in Less Developing Countries. *World Development*. 11(4). 377-380.

Molefe, K., & Choga, I. (2017). Government expenditure and economic growth in South Africa: a vector error correction modeling and Granger Causality Test. *Journal of Economics and Behavioral Studies*, 9(4), 164-172.

Musgrave A. & Musgrave P.B. (1989). *Public finance in theory and practice*. New Delhi, Tata McGraw Hill Education Private Limited.

Nigerian Tribune. (2021, September 7). 76 million Nigerian adults are illiterates — FG. *Nigerian Tribune*. https://tribuneonlineng.com/76-million-nigerian-adults-are-illiterates/

Obi, C. K. (2020). Government Recurrent Expenditure Effect on Economic Growth: Evidence from Expenditure on some Selected Variables. *ActaUniversitatisDanubius (AUDŒ),* Vol. 16, no. 1/2020, pp. 228-237

Okoro, A. S. (2013). Government spending and economic growth in Nigeria. *Global Journal of Management and Business Research Economics and Commerce,* 13(5), 21-30.

Olayungbo, D. (2019). Effects of oil export revenue on economic growth in Nigeria: A time varying analysis of resource curse. *Resources Policy*. 64. 1-10. 10.1016/j.resourpol.2019.101469.

Olayungbo, D. O. & Olayemi, O. F. (2018). Dynamic relationships among non-oil revenue, government spending and economic growth in an oil producing country: Evidence from Nigeria. *Future Business Journal*, 4(2), 246-260.

Onifade, S.T., Cevik, S., Erdogan, S., Asongu, S. & Bekun, F. V. (2020). An empirical retrospect of the impacts of government expenditures on economic growth: new evidence from the Nigerian economy. *Economic Structures* 9(6). https://doi.org/10.1186/s40008-020- 0186-7

Onwube, O., Chukwu A. B., Ahamba, K. O., *et al.,* (2021). Determinants of Life Expectancy in Nigeria: An Autoregressive Distributed Lag Approach. *Journal of Sustainability Science and Management.* Volume 16 Number 8.

Sims, C. A. (1980b). Macroeconomy and Reality. *Econometrica: Journal of the Econometric Society*, 1-48

Srinivasan, P. (2013). Causality between public expenditure and economic growth: the Indian case. *Journal of Economic and Management*, 7(2), 335-340.

Tade, O. (2019). Policing Looted Funds with the Whistle: Newspaper Coverage of the Anti-corruption Crusade in Nigeria. *Africa Development 44*(4), 73–90.

Thabane, K. &Lebina, S. (2016). Economic growth and government spending nexus: Empirical evidence from Lesotha. *African Journal of Economic Review.* 4(1): 86-100.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*. Vol. 66(1-2), 225-250.

Umar, M. and Dahalan, J. (2016). An Application of Asymmetric Toda–Yamamoto Causality on Exchange Rate-inflation Differentials in Emerging Economies. *International Journal of Economics and Financial Issues*. Vol. 6. Issue 2 • 2016

Usman, A., Mobolaji, H. I., Kilishi, A. A., Yaru, M. A., & Yakubu, T. A. (2011). Public expenditure and economic growth in Nigeria. *Asian Economic and Financial Review*. Vol.1(3), 104- 113.

Wagner, A. (1876). 'Three extract on public finance'. *Classics in the theory of public finance* (Eds) Musgrave and Peacock. New York: *St Martin Press*.

Warner A. M. (2006). Raising Labour Participation as a source of pro - poor growth. (G. K.-L. Pleskovic, Ed.) *Equity and Development*, pp. 173-187.

World Bank (2015). Introduction to Public Sector Governance and Accountability Series: Public Expenditure analysis. *Washington, D.C. The World Bank Group*.

Yasin, M. (2003). Public Spending and Economic Growth: Empirical Investigation of Sub-Saharan Africa. *Southwestern Economic Review*. Vol. 1 59-68

Zakari, M. B. & Button, M. (2022). Confronting the Monolith: Insider Accounts of the Nature and Techniques of Corruption in Nigeria. *Journal of White Collar and Corporate Crime.* 100-108.