Examining Government Spending and its Effect on Economic Growth in Nigeria: An Error Correction Approach

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Abstract
The study employed co-integration and error correction model to investigate the effects of government spending on economic growth in Nigeria over the period from 1980 to 2022. The study entailed the acquisition of time-series data from the statistical bulletin of the Central Bank of Nigeria. The results of the unit root test showed that all variables in the model were non-stationary at their initial levels but integrated at a first-order, denoted as I(1). In the long-term analysis, Real GDP indicates a positive and significant linear connection between the two factors. However, in the short term, capital expenditure demonstrated a favorable impact and a significant association with economic expansion. On the contrary, recurrent expenditure and inflation displayed harmful but insignificant effects on economic growth. Based on the findings, it is suggested that the government should consider improving the compensation and benefits of its workforce. Nevertheless, strict oversight should be maintained over these expenditures, with thorough monitoring of the program's progress from inception to completion. These measures are expected to indirectly contribute to the economic growth and prosperity of the nation.

Keywords: Government Expenditure, Economic growth, Capital expenditure, Recurrent expenditure, Inflation.

Introduction
Over time, government expenditure in Nigeria and other emerging economies has consistently increased. However, this rise has not been accompanied by corresponding economic growth and progress. Economists have long recognized the potential positive outcomes linked with promoting economic development. According to Ebipre and Eniekezimene (2020), government spending can be categorized into two groups: recurring expenditures and capital outlays. Recurring costs include administrative expenditures like salaries and interest on loans, while capital expenses relate to investments in 'capital projects' such as the development of infrastructure, including road construction, port and airport expansion, healthcare and education provision, hydro power projects, telecommunications, and military equipment. In general, it is believed that government expenditure, particularly on social and economic infrastructure, has the capacity to stimulate growth. Nevertheless, financing such outlays to provide crucial infrastructure like transportation, energy, telecommunications, education, and healthcare services could impede growth (Olukayode, 2009).

Despite the increasing government outlays in Nigeria over time, concerns from the public about deteriorating infrastructure endure. The connection between government disbursements in Nigeria and economic expansion remains puzzling. Some studies propose a robust adverse connection between government expenditure and economic growth. Others argue for either no connection or a substantial inverse association between heightened government spending and improved real output.

Numerous research initiatives have been launched to examine the impact of government disbursements on economic development and growth in Nigeria. Abu and Abdullahi's (2010) short-term examination of recurring and capital expenditures, as well as government spending in sectors such as agriculture, education, defense, health, and transportation, unveiled unfavorable effects on economic growth. In contrast, Nyarko-Asomani et al. (2019), Ahuja and Pandit (2020), and Aluthge et al. (2021) found a beneficial relationship between government spending and economic growth in Nigeria. Conversely, Saidu and Ibrahim (2019) and Daniel and Lawrence (2021) contend that there is no observable link between government disbursements and economic growth in Nigeria.

The purpose of this research is to utilize different approaches to investigate the measurable effect of government expenditure on Nigeria's economic growth and development. The aim is to fill the knowledge gaps in this field. The ultimate objective is to elucidate the complex interactions between government spending and economic progress, ultimately guiding strategies for nurturing a strong and flourishing economy.

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In Nigeria, the government's involvement in economic matters is evident through substantial annual budget allocations. Considering the significant financial resources allocated by the Nigerian federal government, one might expect swift economic progress in the nation. Despite Nigeria's economy being acknowledged as the largest in Africa and projected to reach a GDP of $574 billion by the end of 2023, as per the IMF's World Economic Outlook, this growth has not significantly ameliorated the challenges faced by everyday citizens. The harsh realities of poverty and unemployment persist, prompting questions about the effectiveness of government expenditure in fostering comprehensive growth. The response of the Nigerian economy to government disbursements sparks inquiries into the principal determinants of economic growth in the country. This leads to an exploration of the vital factors influencing Nigeria's economic trajectory and the ensuing impacts of these factors on its growth trends. These inquiries lay the groundwork for a thorough study aimed at addressing these critical issues.

Research has centered on analyzing the impact of government spending on economic growth in Nigeria. Among these studies are those conducted by Adamu et al. (2023) and Chukwuma et al. (2023). They utilized the Auto Regressive Distributed Lag (ARDL) model to examine the relationship among the variables under investigation. Meanwhile, Ibrahim and Yahaya (2023) employed Ordinary Least Squares (OLS) to assess the correlation between the natural log of Gross Domestic Products (LGDPs), the log of recurrent government expenditure (RGE), the log of the first lag of recurrent government expenditure (RGE), the log of capital government expenditure (CGE), and the domestic debt of the federal government (LFGDD). This study employed the Error Correction Model (ECM) to elucidate the impact of government expenditure on economic growth in Nigeria.

The research addresses the subsequent inquiries: How do recurrent and capital expenditures influence economic growth in Nigeria? Does a significant connection exist among inflation, government spending, and economic growth in Nigeria? The structure of this paper is as follows: The literature from previous studies is reviewed in Section II, along with an explanation of their methods. The theoretical framework of government spending is briefly reviewed in Section III. The model requirements and technique used are described in Section IV. Section V presents the findings along with their explanations. In conclusion, Section VI discusses the results, draws conclusions, and makes recommendations.

II. Literature Review

Government outlays, commonly referred to as the financial outlays of the government, encompass various financial commitments essential for the operation and maintenance of the nation's institutions, economy, and the welfare of society. These expenses have a tendency to grow over time, in line with economic expansion and the widening of the government's range of operations. Ogboru (2010) identified two main budget categories: recurring and capital budgets. The former, known as the revenue budget, addresses ongoing costs, while the latter relates to the expenses associated with obtaining capital assets. Bingilar and Oyadongha (2020) reiterated the concept of government disbursements, underscoring their role in sustaining institutions, the economy, and society. They emphasized that such expenditures typically increase as the economy expands in size and complexity or due to an enlargement of the government's operations.

Economic development, as defined by Muritala and Taiwo (2011), denotes a nation's continual progression in its ability to provide a wide array of economic goods to its populace. This advancement is facilitated by technological advancements and various adaptations on the institutional and ideological fronts. To escape the cycle of poverty, a developing economy must maintain sustainable economic expansion, as observed by Ogundipe and Oluwatobi (2010). Todaro and Smith (2005) depict economic development as an ongoing process that boosts a nation's productive capacities, leading to amplified levels of national output and income. This viewpoint aligns with Lipsey and Chrystal (2007), who view economic advancement as the impetus behind achieving sustained enhancements in the general standard of living over the long term.

The International Monetary Fund (IMF) (2012) characterizes economic growth as the rise in the market value of goods and services produced by an economy over time, gauged by the percentage increase in real GDP. Jhinghan (2011) underscores a sustained quantitative expansion in a nation's per capita output or income, coupled with growth in the labor force, consumption, capital, and trade volume. Though "economic growth" and "economic development" may have distinct meanings, they are occasionally used interchangeably. Kimberly Amadeo (2022) emphasizes economic growth as the surge in a country's production of goods and services over a specified period, with Gross Domestic Product (GDP) serving as the primary metric since it encompasses the entirety of a nation's economic output. Inflation, on the other hand, signifies the surge in the general price level of goods and services within an economy over a specific period. This phenomenon leads to a reduction in the purchasing power of citizens, as pointed out by Olugbenga Anthony and Oluwabunmi Dada (2020). Inflation can be characterized as a prolonged increase in the prices of a wide range of goods and services, determined by the rate of growth in the general price level over a particular period, as described by Mahmut Zeki Akarsu (2021) and Miftahu Idris (2021). The inflation rate is typically

calculated based on the percentage change in price indices, such as the consumer price index, wholesale price index, or producer price index.

Numerous empirical investigations have explored the impact of government spending on economic growth, utilizing diverse estimation methodologies. Authors' perspectives diverge on the directional relationship between government expenditure and economic growth.

Mussa (2021) investigated how the reallocation of public expenditure in Tanzania affects long-term growth. Shifting from consumption to capital investment promotes growth, while the reverse hampers it. Aluthge et al (2021) reported a positive and significant connection between capital expenditure and economic growth in both the short and long terms. Recurrent spending lacked substantial impact. Gukat (2015) examined government spending on human capital and its effect on Nigeria's economic growth, finding a positive and significant impact. Khaled (2020) analyzed the influence of government spending on Jordan's economy, with insignificant effects on GDP percentages. Magaji (2019) explored the impact of government expenditure on Nigeria's growth, revealing a negative link for capital expenditure and a positive one for recurrent expenditure.

Ogar et al (2019) identified a positive yet statistically insignificant association between capital expenditure and growth, while recurrent spending had a positive impact but lacked significance. Cristian and Laura (2021) studied Romania's government spending and growth, revealing no long-run cointegration but confirming short-run double causality. These studies collectively underscore the intricate and varied relationship between government spending and economic growth, dependent on factors such as the type of expenditure, region, and economic context.

Methodological Review
Mussa (2021) conducted an exploration of the potential for government-led growth enhancement through the reallocation of public expenditure in Tanzania. The study employed Johansen's maximum likelihood method to establish co-integration and subsequently gauge the long-term relationship among the variables. Results demonstrated that augmenting government spending on physical and human capital investments has a positive impact on economic growth. Conversely, expenditure on consumption exerted a negative effect on growth. Notably, the study discovered that transitioning expenditure from consumption to investments in physical and human capital can bolster economic growth, whereas the reverse stifles it. Furthermore, the study uncovered no evidence of output costs associated with transitioning between physical and human capital investment spending.

In the case of Aluthge et al (2021), the focus shifted to Nigeria, examining the nexus between government expenditure and economic growth between 1970 and 2019. The research incorporated the ARDL model, accommodating structural breaks in unit root testing and co-integration analysis. The study investigated the impact of capital and recurrent expenditure on economic growth, as well as the influence of control variables such as labor force, trade openness, inflation, and non-oil revenue.

Conversely, Khaled (2020) centered on Jordan's economy, employing the ARDL model to scrutinize the influence of government spending on economic growth during 2010-2019. Despite the suitability of the ARDL model for time series data, concerns arose due to the absence of essential pre-tests such as unit root and co-integration analyses. The study's limited timeframe also cast doubt on the reliability of the ARDL model's application.

III. Theoretical Framework
There are several theories which attempt to establish the relationship between government spending and economic growth. However, this study will concentrate on Wagner's law of Increasing State Activity.

Wagner's law was propounded by German economist Adolph Wagner (1835-1917). Wagner's Law posits that as an economy develops and matures, the role and functions of the government tend to expand. This expansion leads to an increase in government expenditure on various public goods and services, such as infrastructure, education, healthcare, and social welfare programs. Wagner's Law assumes that as an economy undergoes industrialization and experiences economic growth, the demand for public goods and services increases due to rising income and changing societal needs. Also, that as societies become more complex and advanced, there is a growing demand for a broader range of public services, including education, healthcare, infrastructure, and social welfare programs. He also assumes that government intervention becomes necessary to address market failures, such as natural monopolies and externalities, which require public goods provision and regulation.

IV. Research Methodology
The present study employs time series secondary data spanning from 1980 to 2022 to explore the impact of government expenditure on economic growth within Nigeria. The pertinent variables encompass Real Gross

Domestic Growth (RGDP) as the dependent variable, Government capital expenditure (GCE), Government recurrent expenditure (GRE) as the independent variables, and inflation rate (INF) as the control variable. The research adopted a descriptive research design and employed econometric techniques encompassing descriptive statistics, the Augmented Dickey Fuller unit root test, Johansen co-integration test, and an error correction model.

Model Specification

$$RGDP = f(GCE, GRE, INF) \tag{1}$$

The equation (1) above can be restated in the econometric form as;
$$RGDP_t = \beta_0 + \beta_1 GCE_t + \beta_2 GRE_t + \beta_3 INF_t + \mu \tag{2}$$

$$\Delta RGDP_{t-1} = \alpha + \Sigma GCE_{t-1} + \Sigma GRE_{t-1} + \Sigma TINF_{t-1} + ECM_{t-1} \tag{3}$$

Where,

RGDP	=	*Real gross domestic product*
GCE	=	*Government capital expenditure*
GRE	=	*Government recurrent expenditure*
INF	=	*Inflation rate*
$\beta_0, \beta_3,$	=	*Parameters to be estimated*
μ	=	*Stochastic error terms*
ECM_{t-1}	=	*Error Correction term,*
t-1	=	*Variable Lagged by one period.*

V. Discussion of Result
Descriptive Statistic
The mean of government recurrent expenditure is 5.796441 and that of capital expenditure is 5.121561. The Standard deviation for recurrent expenditure is 2.457599 with Kurtosis of 1.783519 and Skewness of -0.392290. The Standard deviation of capital expenditure is 2.047642 with Kurtosis and Skewness, while the mean of inflation is 21.39205. It has standard deviation of 34.71708 with Kurtosis of 27.08204 and Skewness of 4.743288. Average economic growth during this period is 10.40814 percent with skewness 0.267289 and Kurtosis of 1.496112. The value of Kurtosis during the period reveals that the distribution of growth rate during the period is approximately normal with the standard deviation of 0.534044.

Table 1: Result of the Descriptive Statistic

	RGDP	GCE	GRE	INF
Mean	10.40814	5.121561	5.796441	21.39205
Median	10.20119	5.772618	6.361820	10.38478
Maximum	11.20344	7.832993	9.120979	219.0028
Std. Dev.	0.534044	2.047642	2.457599	34.71708
Skewness	0.267289	-0.593846	-0.392290	4.743288
Kurtosis	1.496112	1.88357	1.783519	27.08204

Source: Authors computation using E-views 10

Stability test
A stability test determines whether the time series data used in the model is stationary or non-stationary. The outcomes of the Augmented Dickey Fuller unit root test indicated that the variables weren't stationary at significance levels of 1%, 5%, and 10%, but they were stationary at the first difference denoted as I(1) in the integration order. As a result, the null hypothesis was rejected, and the alternate hypothesis was accepted. Consequently, the Johansen Co-integration Test was analysed. The provided information captures the notion that the Augmented Dickey Fuller test assesses stationarity, specifically in the context of economic time series data.

Table 2: Philips-Perron Unit Root Test

Variable	Levels	Critical Values		First differences	Critical Values		Order of Integration	Remark
RGDP	-1.359756	1%	-3.605593	-3.230352*	1%	-3.610453	I(1)	Stationary at 1st difference
		5%	-2.936942		5%	-2.938987		
		10%	-2.606857		10%	-2.607932		
GRE	-0.331394	1%	-3.605593	-4.705692*	1%	-3.610453	I(1)	Stationary at 1st difference
		5%	-2.936942		5%	-2.938987		
		10%	-2.606857		10%	-2.607932		
GCE	-1.136083	1%	-3.605593	-3.038828*	1%	-3.610453	I(1)	Stationary at 1st difference
		5%	-2.936942		5%	-2.938987		
		10%	-2.606857		10%	-2.607932		
		5%	-2.9511		5%	-2.938987		
		10%	-2.6143		10%	-2.607932		
INF	-4.629957	1%	-3.605593	-7.307664*	1%	-3.615588	I(1)	Stationary at 1st difference
		5%	-2.936942		5%	-2.941145		
		10%	-2.606857		10%	-2.609066		

Source: Authors computation using E-views 10 (*UR = Unit Root). Numbers indicates the p-values. A maximum of 4 lags were included. Philips-Perron.

Co-integration Test

The outcomes of the Johansen Co-integration test point to a lasting connection between real gross domestic product, government capital expenditure, government recurrent expenditure, and inflation in Nigeria. Both the trace and max-eigen statistics suggest the presence of a co-integrating equation, indicating an enduring relationship among the variables. These findings imply that all factors share a common stochastic trend and grow proportionately.

Table 3: Johansen Co-Integration Test

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.997364	372.4077	95.75366	0.0001
At most 1 *	0.865913	140.8047	69.81889	0.0000
At most 2 *	0.692581	62.44324	47.85613	0.0012
At most 3	0.021586	0.851063	3.841466	0.3563

Source: Authors computation using E-views 10 Trace test indicates 3 co-integrating eqn(s) at the 0.05 level

Error Correction Model

The findings of the Error Correction Model (ECM) indicate an enduring connection among the variables, suggesting that it takes several years to attain equilibrium. The study revealed a insignificant and negative correlation between government capital expenditure and real gross domestic product in the long run. Conversely, the research unveiled an insignificant and negative link between government recurrent expenditure, inflation, and real gross domestic product. The R2 adjusted coefficient of determination was 0.999537, denoting a robust relationship between the variables. Autocorrelation was absent according to the Durbin-Watson analysis. On the whole, the study implies that the full impact of government expenditure on economic growth in Nigeria remains uncertain. Nonetheless, it establishes that capital expenditure positively influences economic growth, while recurrent expenditure and inflation exert a negative impact.

Table 4: Estimated Long Run Coefficients Using Error Correction Model

Variable: (RGDP)	Coefficient	Std. Error	P-Value
GCE	1.139472	0.072803	0.5400
GRE	-0.114019	0.034197	0.0021
INF	-0.008715	0.014513	0.5523
ECM(-1)	-0.323070	0.194485	0.1062
Adjusted R-square	0.999453		
Durbin-Watson stat	1.962045		

Source: Authors computation using E-views 9

VI. Discussion of Findings

The outcomes indicate that government capital expenditure exerts a significant and positive influence on economic growth. Conversely, both Government Recurrent expenditure and inflation exhibit a notable and adverse impact on economic growth. The results further demonstrate the existence of short-term relationships

between government capital expenditure, government recurrent expenditure, inflation, and economic growth in Nigeria.

These findings are consistent with previous research. Aluthge et al (2021) and Magaji Abubakar (2019) concur, highlighting a favorable and significant relationship between government capital expenditure and economic growth, while identifying a negative impact of government recurrent expenditure and inflation on economic growth in Nigeria. Samuel et al (2021) also identify a detrimental effect of government recurrent expenditure on economic growth in Nigeria. However, there are opposing findings in the work of Eugene Iheanacho (2016), who asserts that government capital expenditure has a negative and insignificant effect on economic growth. In light of these results, it becomes evident that despite the rise in government expenditure, the desired growth and development have not been fully realized in the Nigerian economy.

Conclusion

Based on the outcomes of the study, it is evident that government capital expenditure plays a significant and positive role in fostering economic growth in Nigeria. Conversely, the findings reveal adverse impacts of both Government Recurrent expenditure and inflation on economic growth. Moreover, the study highlights the presence of short-term relationships among government capital expenditure, government recurrent expenditure, inflation, and economic growth.

In light of these findings, it is apparent that despite increased government expenditure, the anticipated levels of growth and development have not been fully realized in the Nigerian economy. This underscores the need for policymakers to reassess spending priorities and enhance the effectiveness of resource allocation to drive sustainable economic growth and development in Nigeria.

Recommendations

The study's findings reveal that during the observed period, capital expenditure exhibited a positive and substantial impact on the Nigerian economy. Conversely, recurrent expenditure displayed a detrimental effect on economic growth. This outcome can likely be attributed to the misallocation of government funds, which should have been directed towards increasing salary payments, worker benefits, on-the-job training, and retraining for the national labor force. Unfortunately, these resources have been diverted or misused for personal gain, potentially due to the prevailing corruption in the country, as evidenced by Nigeria's placement on the Transparency International Corruption Perception Index. In light of these findings, it is recommended that the government prioritize the enhancement of salaries and benefits for its employees, along with the provision of effective on-the-job training. However, stringent oversight and continuous monitoring should be established to ensure the proper utilization of these expenditures and the successful execution of the programs from initiation to completion.

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