

CAPITAL EXPENDITURE AND REAL SECTOR PERFORMANCE: A FINANCIAL EDUCATION PERSPECTIVE

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ABSTRACT

This study investigates the link between government capital expenditure and real sector performance for financial education purpose in Nigeria, with emphasis on the agricultural and manufacturing subsectors from 1990 to 2024. Using annual time-series data from the Central Bank of Nigeria and applying ordinary least squares regression, the findings reveal that capital expenditure has a positive and statistically significant effect on both agricultural and manufacturing sector outputs. These results align with Keynesian and Endogenous Growth Theories, as well as empirical evidence from recent Nigerian studies, which emphasize the importance of targeted capital investment in infrastructure, education, and technology. The study concludes that sustained and well-implemented capital expenditure is essential for boosting real sector productivity, performance and recommends financial education on prioritizing capital projects, strengthening transparency and accountability, and ensuring complementary investments in human capital and infrastructure maintenance.

Keywords: Capital Expenditure; Real Sector Performance; Financial Education

JEL Classification: H53, L10, L25

1. INTRODUCTION

In order to sustain growth in output, there is need for a more consistent and predictable funding of the priority sectors of the economy, especially the real sector. The real sector, also known as the productive sector, ensures the production of goods and services, creation of employment opportunities, reduction in poverty, wealth creation and stabilization of economic activities (Obembe, 2011). As buttressed by Bezemer (2012), sustainable growth in the longer term can only be achieved by an increased funding of the real sector. This ensures equitable returns to the lender while sustaining effective demand for goods and services, thereby

supporting economic growth. Estrada et al. (2018) also emphasized that credit stagnation is more likely to cause lower output growth in an economy than credit recession. It has therefore been argued in the literature that increased funding of the real sector is likely to enhance output growth and social welfare.

The real sector comprises the primary, secondary and tertiary subsectors. The primary sub-sector is involved in the production and extraction of natural resources from agriculture, forestry, fishing, mining of solid mineral and crude oil and gas. Secondary sub-sector includes the manufacturing, industries, construction and building. This sub-sector processes primary sector products into either semi-finished or finished goods. The sector also covers building and construction activities. The tertiary sector is made up of all trade and service activities. By extending credit to the real sector, more inclusive growth can be guaranteed. It is on this premise that the World Bank (2018) observed that financing agriculture (a key component of the real sector) will empower poor and low-level farmers to increase their wealth and food production.

In Nigeria, efforts have also been driven towards improving real sector productivity; especially by the Federal Government. In this regard, several initiatives have been introduced, notably by the government and the Central Bank of Nigeria (CBN). Government expenditure is meant to stimulate economic activity critical for national progress. Many countries spend government money on socially beneficial investments aimed at improving the well-being of the population. Public expenditure is used as a balancing factor in the economy especially in times of recession. Economic literature has well documented the theoretical underpinning of such expenditure. In the Keynesian literature on public finance spending, expenditure, in a depression, stimulates government spending, which directly stimulates the demand, which in return, stimulates the workers, and sets the economy in motion through higher production and growth (Okonkwo et al., 2023). It is also in Wagner's and other public finance theorists of economic growth that as the economy grows and the society undergoes industrial transformation; the government appropriation increases spending on social and economic activities (Ijuo & Andohol 2020).

Government expenditure is either expansionary or contractionary depending on the resources at the disposal of the government and the macroeconomic targets. It is expansionary when government increases its spending and contractionary when government reduces its spending due to economic and financial constraints or deliberate policy targets. The connection between government revenue and expenditure can be linked to the relationship between income and government spending, as elucidated by Wagner's theory of expanding state activities (Wagner,

1890), while Keynes postulates that an increase in government expenditure increases the level of economic growth through its multiplier effect (Sule, 2019)

Over the past decades, government expenditure has remained the subject of fiscal policy debates, growth, and national development. Nigeria being the largest economy in Africa and one of the world's most populous nations is largely dependent on government spending for economic activity and development initiatives (Nwikipugi & Agbana, 2025). Government expenditure in Nigeria entails a myriad of functions such as spending on education, healthcare, agriculture, infrastructure development, defense policy, public service delivery, and social welfare (Mensah & Adukpo, 2025). Theoretically, such spending should stimulate economic growth, enhance employment opportunities, and living standards in general. The efficacy of government spending largely rests upon the allocation of funds in a determinate manner and the implementation by funds in a transparent and effective way (Chandana et al., 2024).

Government expenditure is essential for the long-term vitality of the global economy and for sustainable development. Keynesian perspectives advocate for more government expenditure to stimulate demand, whereas Endogenous development models illustrate how investment may foster sustained economic growth. Both concepts emphasize the significance of government involvement in economic affairs (Jibir & Aluthge, 2019). Nigeria is a growing nation recognized for its abundant natural resources and rapidly increasing population. The government must allocate funds to assist the impoverished, enhance workforce training, and rehabilitate infrastructure. When crude oil prices are up, the Nigerian government allocates increased funds for capital and current projects. This trend is characterized by significant political and economic instability, including the transition to democracy in 1999 and periods of military governance ([Okonkwo](#) et al., 2021).

But despite substantial government expenditure, the economy remains underperforming. This is evidenced by stagnant per capita income, increasing poverty rates, and insufficient human development indicators (World Bank, 2020) In spite of anticipated positive benefits of government expenditure on the economy, unemployment remains elevated, infrastructure is deficient, and living conditions are substandard. The misallocation of billions of naira intended for infrastructure projects has adversely impacted private sector growth and citizen welfare. This has led to an absence of roads, electricity, and public healthcare services. When the economic benefits of increased government expenditure are unquantifiable, politicians, scholars, and the populace face a challenging predicament. The pertinent question is: Why has Nigeria not had a comparable robust correlation between government expenditure and real sector productivity as seen in other countries?

Although there has been much literature on the link between government expenditure and economic growth, many of such studies have focused on the overall economy, with little attempt at estimating sectoral causality. This study provides a point of departure by estimating the impact of government expenditure on real sector productivity in Nigeria.

2. LITERATURE REVIEW

Capital Expenditure

Generally, public expenditure refers to the costs borne by public entities, such as the federal, state, and municipal governments, in order to deliver public goods and meet the general socioeconomic needs of the populace (Thomas, 2020). But public expenditure is categorized into capital expenditure and recurrent expenditure. Spending on items or projects like roads, airports, schools, telecommunications, and electricity production are examples of capital expenditures. Recurrent expenses, on the other hand, are sums paid by the government for administration, including salaries, interest on loans, maintenance costs, and transfer payments.

Real Sector

Otherwise called productive sector, real sector offers services or manufacture goods. This sector has a high potential for generating employment opportunities, wealth creation and capacity for economic diversification (Anyanwu, 2012). Obembe (2011) describes the real sector as the productive sector of the economy which comprises Agriculture, Manufacturing, Construction, Real Estate, Mining and Quarrying. Also, Adeusi and Aluko (2015) describe the sector as a constituent of the economy consisting of individuals and companies that are involved in economic activities aimed at producing services and goods to meet the demand of the general public. According to CBN (2015), the real sector is the sector of the economy that engages in the production of goods and services using a combination of raw materials and other factors of production like labour, land and capital.

The growth of real sector being a component of an economy is measured by increase in the sector's output over time and also its contribution to GDP. Atang (2017) describes the real sector to be a strategic sector that produces and distributes tangible goods/services to meet aggregate demand in an economy. Also, a vibrant real sector creates more linkages in the economy than any other sector. The performance of the sector can be viewed as a measure of effective government macro-economic policies, evident in the sector's capacity building role, high employment and income generating potentials. The real sector of the economy depends on the financial sector for necessary funding to facilitate the purchase of inputs locally and by importation (Osinubi & Akinyele, 2006). Olaitan (2016) explains that the Nigeria's real sector

is made up of primary, secondary and tertiary sub-sectors. The primary sub-sector focuses on production and extraction of natural resources and its activities covers agriculture and mining. This sector produces the raw materials that are either consumed directly or are being used as input for the manufacturing of other finished goods.

The secondary sub-sector comprises manufacturing and industries which processes products of the primary sector into either semi-finished or finished goods. Equally in that sector is the construction/building sub-sector and lastly, the tertiary sub-sector whose activities are services, commerce, information technology, telecom and tourism. This classification is in accordance with Fisher's three sector economic models. The real sector will be viewed from the production sector particularly agriculture and manufacturing sub-sectors.

2.2 Theoretical Framework

Several theories and models have been advanced in a bid to explore the nexus between government expenditure and economic growth.

2.2.2 Neo-Classical Growth Theory

Following the Harrod Domar's model of economic growth, Solow (1956) developed the neo-classical growth model and subsequently nicknamed it the "Solow Model". The theory emphasized that accumulation of capital is the engine for economic growth and development. The nucleus of the neo-classical theory is on prices, outputs and income distribution in market unwavering by forces of demand and supply. A possible growth patterns is shown by using the variable of the ratio of capital to labour indicating that capital accumulation is consistent with the growth rate of the labour force (Mohd-Nor, 2015). From the assumption of this theory, individual's rationality enables them to maximize their utility or profit and emphasis placed on equilibrium, the interactions of consumers and firms in a free market should yield an equilibrium quantity and supply (Henning, 2008). Mohd-Nor (2015) stated that Romer established a one-sector neoclassical model with technological change, and observed that growth is promoted, assisted by the technological change that arises from international investment decisions made by profit-maximizing agents in the world market integration.

2.3 Empirical Review

Several studies have examined the link between government expenditure and real sector productivity. Ochieka (2025), using ARDL on 1990–2023 data, finds that 'capital expenditure has a significant positive impact on economic growth in the immediate term but exhibits a negative effect in subsequent periods,' and that education spending yields long-run gains. Falade and Olagbaju (2015) analyze data from 1970–2013 with Johansen cointegration and an ECM and report that government capital expenditure raises manufacturing output while

recurrent spending reduces it. They quantify a large positive long-run elasticity for capital outlays. Their work emphasizes composition: shifting budget weight toward productive capital and improving implementation raises industrial performance.

Joshua-Gyang et al. (2023) apply FMOLS to cointegrated series through 2021 and find recurrent expenditure has a significant positive association with industrial output, whereas capital expenditure is positive but statistically insignificant. Their result highlights that, in some periods, demand-supporting recurrent items or poor capital project execution can make recurrent spending appear more immediately effective than capital budgets. Chikelu and Okoro (2016) use ADF, Johansen cointegration, ECM, and Granger tests on 1970–2012 data and report both a significant positive effect of capital expenditure on manufacturing and Granger causality from capital spending to manufacturing growth. Their causality evidence strengthens the temporal claim that public capital allocations precede manufacturing gains, supporting calls for higher, better-targeted capital budgets.

Nwokorobia and Okonkwo (2023) find GCAPE in the period 1981 to 2022 raises absolute manufacturing output but — paradoxically — relates negatively to the manufacturing sector's share of GDP, suggesting either faster growth elsewhere, measurement issues, or misallocated projects. They argue the solution is not only more spending but frugal, accountable allocation and stronger oversight to ensure capital translates into competitive industrial growth. Afolabi and Yusuf (2025) estimate ARDL models for 1981–2023 across manufacturing, agriculture, and services and conclude capital expenditure has a positive long-run effect on real-sector output while the Monetary Policy Rate stimulates manufacturing short-term but harms it long-term. Their cross-sectoral evidence underscores the need for fiscal–monetary coordination and complementary investments (power, transport, human capital) to sustain gains.

Udom and Felix (2019) examine education-sector spending and its macro effects using a Vector Error Correction Model on Nigerian data (1990–2017). They find moderate short-run impacts but significant long-run benefits from educational investment, reinforcing the view that human-capital spending is a slow-burn driver of growth. Chukwuma and Okorie (2020) use a Structural VAR (1995–2018) to compare machinery (physical capital) and education spending. They report that machinery yields faster industrial returns while education builds durable long-term capacity, and that complementarities matter when both types of spending are present.

Lawal and Oluwatoyin (2022) apply ARDL bounds testing (2000–2019) to assess technological and innovation-oriented capital spending. They find strong positive long-run links between tech-focused public investment and GDP growth, suggesting that targeted R&D

and tech infrastructure amplify private productivity. Uche and Eke (2023) conduct a sectoral growth-accounting analysis (1990–2022) of infrastructure spending in transportation and telecommunications. They show strategic infrastructure investments produce the largest long-run growth dividends, particularly when projects are completed and maintained.

3. METHODOLOGY

The study employed annual time series data from the Central Bank of Nigeria (CBN) bulletin from 1990 to 2024, and ordinary least square technique. Two models were employed as follows:

$$ASO = f(CEXP) \quad (1)$$

$$MSO = f(CEXP) \quad (2)$$

Transforming the functional model to an econometric model:

$$ASO = \alpha_0 + \alpha_1 CEXP + \mu_1 \quad (3)$$

$$MSO = \beta_0 + \beta_1 CEXP + \mu_2 \quad (3)$$

Where ASO = Agricultural Sector Output, MSO = Manufacturing Sector Output, CEXP = Capital Expenditure, α_0, β_0 = Constant, α_1, β_1 = Coefficients of independent variables, μ_1, μ_2 = Error Term

A priori = $\alpha_1, \beta_1 > 0$

4. RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

	LNCEXP	LNASO	LNMSO
Mean	26.94442	29.28583	28.48387
Median	27.20578	29.77718	28.50699
Maximum	29.28441	31.66489	31.10095
Minimum	23.90340	25.39263	25.15729
Std. Dev.	1.362367	1.819429	1.689078
Skewness	-0.569973	-0.641602	-0.172793
Kurtosis	2.833751	2.341870	2.047263
Jarque-Bera	1.935378	3.032969	1.497909
Probability	0.379960	0.219482	0.472861
Observations	35	35	35

Source: Author's Computation

The results in Table 1 show that all the variables are normally distributed.

Table 2: OLS Regression (Model 1)

Dependent Variable: LNASO

Method: Least Squares

Date: 03/23/26 Time: 18:33

Sample: 1990 2024

Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCEXP	1.286648	0.062298	20.65321	0.0000
C	-5.382149	1.680659	-3.202404	0.0030
R-squared	0.928191	Mean dependent var		29.28583
Adjusted R-squared	0.926015	S.D. dependent var		1.819429
S.E. of regression	0.494887	Akaike info criterion		1.486470
Sum squared resid	8.082128	Schwarz criterion		1.575347
Log likelihood	-24.01322	Hannan-Quinn criter.		1.517150
F-statistic	426.5550	Durbin-Watson stat		0.715904
Prob(F-statistic)	0.000000			

Source: Author's Computation

The results in Table 2 indicate that capital expenditure has positive significant effect on ASO, and determines 92.6% of the variations in CEXP.

Table 3: OLS Regression (Model 2)

Dependent Variable: LNMSO

Method: Least Squares

Date: 03/23/26 Time: 18:34

Sample: 1990 2024

Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCEXP	1.182897	0.064640	18.29970	0.0000
C	-3.388597	1.743854	-1.943165	0.0606
R-squared	0.910297	Mean dependent var		28.48387
Adjusted R-squared	0.907578	S.D. dependent var		1.689078
S.E. of regression	0.513495	Akaike info criterion		1.560294
Sum squared resid	8.701357	Schwarz criterion		1.649171

Log likelihood	-25.30514	Hannan-Quinn criter.	1.590974
F-statistic	334.8792	Durbin-Watson stat	0.520174
Prob(F-statistic)	0.000000		

Source: Author's Computation

The results in Table 3 indicate that capital expenditure has positive significant effect on MSO, and determines 90.8% of the variations in CEXP.

4.1 Discussion of Findings

The regression results in Tables 2 and 3 show a highly statistically significant relationship between government capital expenditure (CEXP) and both agricultural sector output (ASO) and manufacturing sector output (MSO). In Model 1, the coefficient of 1.29 for LNCEXP with a t-statistic of 20.65 ($p < 0.001$) indicates that a 1% increase in capital expenditure is associated with about a 1.29% increase in agricultural output. Similarly, in Model 2, the coefficient of 1.18 ($t = 18.30$, $p < 0.001$) suggests that a 1% rise in capital expenditure leads to a 1.18% increase in manufacturing output. The very high R-squared values (0.93 and 0.91) imply that capital expenditure explains over 90% of the variation in sectoral output, underscoring its pivotal role in driving real sector performance.

These findings align with the postulations of Keynesian theory, which posits that government spending stimulates aggregate demand and production, and with Endogenous Growth Theory, which emphasizes the role of public investment in infrastructure and human capital as drivers of long-run growth. They also resonate with empirical literature: Falade and Olagbaju (2015) who found capital expenditure significantly boosts manufacturing output, and Udom and Felix (2019) who reported long-run benefits of education spending. Likewise, Chikelu and Okoro (2016) established that capital expenditure Granger-causes manufacturing growth, and Afolabi and Yusuf (2025) confirmed positive long-run effects of capital spending on Nigeria's real sector.

The justification for these results lies in the fact that capital expenditure finances infrastructure such as roads, power, irrigation, and technology, which reduce production costs, improve efficiency, and expand productive capacity. In agriculture, better rural roads and irrigation systems enhance productivity and market access, while in manufacturing, reliable power and transport infrastructure lower costs and increase competitiveness. The negative constant terms in both models suggest that without capital expenditure, sectoral outputs would be significantly lower, reinforcing the indispensability of public investment.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Government capital expenditure is a critical determinant of Nigeria's agricultural and manufacturing sector performance, with strong positive elasticities and explanatory power. This confirms both theoretical expectations and prior empirical evidence that capital spending is growth-enhancing.

5.2 Recommendations

1. Increase and sustain allocations to capital expenditure, particularly in agriculture and manufacturing-related infrastructure.
2. Ensure transparency, accountability, and efficient implementation of capital projects to maximize impact.
3. Complement capital spending with supportive policies in education, technology, and power to sustain long-run gains.
4. Balance fiscal policy by curbing excessive recurrent expenditure that does not directly contribute to productive capacity.
5. Strengthen monitoring and evaluation frameworks to ensure capital projects are completed and maintained, thereby sustaining their contribution to sectoral output.

Competing Interest: The authors declare that there is no competing or conflicting interest in this manuscript.

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Appendix: Raw Data (N' Billion)

	CEXP	ASO	MSO
1990	24.05	106.63	84.27
1991	28.34	123.24	110.60
1992	39.76	184.12	153.47
1993	54.50	295.32	221.23
1994	70.92	445.27	354.66
1995	121.14	790.14	414.13
1996	212.93	1070.51	477.95
1997	269.65	1211.46	546.71
1998	309.02	1341.04	620.21
1999	498.03	1426.97	713.82
2000	239.45	1508.41	826.03
2001	438.70	2015.42	989.11
2002	321.38	4251.52	1127.23
2003	241.69	4585.93	1304.07
2004	351.25	4935.26	1516.05
2005	519.47	6032.33	1778.73
2006	552.39	7513.30	2082.49
2007	759.28	8551.98	2401.19
2008	960.89	10100.33	2761.55
2009	1,152.80	11625.44	3170.82
2010	883.87	13048.99	3578.64
2011	918.55	14037.83	4527.45
2012	874.70	15816.00	5588.82
2013	1,108.39	16816.55	7233.32
2014	783.12	18018.61	8685.43
2015	818.35	19636.97	8973.77
2016	653.61	21523.51	8903.24
2017	1,242.30	23952.55	10044.48
2018	1,682.10	27371.30	12455.53
2019	2,289.00	31904.14	16781.06
2020	1,614.89	37241.61	19539.55
2021	2,522.47	41126.06	25725.87
2022	3,133.82	47944.06	27508.52
2023	4,486.21	53273.14	28442.90
2024	5,224.65	56478.98	32134.45