Government Capital Spending on Economic Services and Mortality Rate in Nigeria

Elizabeth Ifeyinwa Nnajieze[3].
Enugu State University of Science and Technology, Agbani. Enugu State.

Alex Onyeji Igwe[1]
Department of Accountancy, Enugu State University of Science and Technology, Agbani. Enugu State.

Benjamin Chibuzo Ndu
International Tax Department, Federal Inland Revenue Service, Nigeria.

Abstract: *This study examined the effect of government capital spending on economic services on mortality rate (measured by life expectancy) in Nigeria. It adopted an ex-post facto research design and utilized secondary data spanning from 1981 to 2024, sourced from the Central Bank of Nigeria Statistical Bulletin and World Development Indicators. Ordinary Least Squares (OLS) regression analysis was applied to assess the effect of capital expenditure on economic services, such as transportation, energy, and water supply infrastructure, on life expectancy. The results revealed that government spending on economic services had a negative and significant effect on life expectancy, suggesting issues of inefficiency, poor project execution, or misallocation of resources in this sector. The study concludes that to improve life expectancy, policymakers should enhance the efficiency and strategic focus of capital spending on economic services to ensure these investments effectively support health-related outcomes. It recommends better management and monitoring of economic service projects to maximize their impact on human well-being.*
Keywords: Government capital spending, Life expectancy, Economic services, Nigeria, Public expenditure.

INTRODUCTION

Government spending is a critical tool for enhancing the quality of life and well-being of citizens. In Nigeria, capital expenditures are allocated to various sectors, including economic services such as roads, electricity, and water supply infrastructure. These investments are designed to create long-lasting assets that improve living conditions and support economic development. When government capital spending on economic services is well-planned and

effectively implemented, it can enhance access to essential services, such as healthcare, by improving transportation networks and providing reliable electricity and clean water, all of which are vital for health outcomes (Nzeribe et al., 2022). For instance, good roads facilitate timely access to hospitals during emergencies, while reliable electricity powers medical equipment, and clean water systems reduce water-borne diseases. The World Bank (2023) emphasizes that Nigeria's government spending should prioritize areas that directly impact citizens' well-being, including infrastructure that supports health and development.

Nigeria has one of the lowest life expectancy rates globally. Life expectancy, defined as the average number of years a person is expected to live, was reported by the World Health Organization (2022) to be approximately 53 years for men and 56 years for women in 2022, significantly below the global average of over 70 years. This low life expectancy is attributed to challenges such as poor healthcare access, inadequate infrastructure, and a high prevalence of preventable diseases like malaria, diarrhea, and infections. According to the Lancet Nigeria Commission (Abubakar et al., 2022), these issues are exacerbated by poor government planning and underfunding of critical services like water and sanitation, which are often addressed through economic service expenditures.

While the Nigerian government allocates funds to economic services annually, it remains unclear whether these investments effectively contribute to improving life expectancy. Some studies, such as Nzeribe et al. (2022), indicate that health-focused spending reduces mortality and extends life expectancy, but there is limited research on how capital spending on economic services, such as transportation and energy infrastructure, impacts health outcomes. This lack of clarity is concerning, as misdirected or poorly executed spending may fail to enhance citizens' lives. The World Bank (2023) notes that Nigeria's infrastructure deficits, including inadequate roads and water systems, hinder health improvements, underscoring the need to evaluate the effectiveness of economic service investments.

This study aims to fill this gap by examining how government capital spending on economic services affects life expectancy in Nigeria. Using data from 1981 to 2024, sourced from the Central Bank of Nigeria Statistical Bulletin and World Development Indicators, the study investigates whether investments in economic infrastructure, such as roads and electricity, contribute to longer lifespans. The findings will provide insights into the effectiveness of these investments and guide policymakers in optimizing resource allocation to improve health outcomes.

Statement of the Problem
Nigeria's low life expectancy, averaging around 54 years in recent years, reflects significant challenges in healthcare access and infrastructure development. Government capital spending on economic services, which includes investments in transportation networks, energy systems, and water supply facilities, is intended to improve access to essential services and enhance public health. However, it is unclear whether these investments directly contribute to increased life expectancy. Issues such as poor project implementation, corruption, or misallocation of resources may limit the effectiveness of economic service spending (Abubakar et al., 2022). For example, Nigeria's infrastructure deficits, including only 31% of its 195,000 km road network being paved and 60 million people lacking access to basic drinking water, significantly hinder healthcare access and health outcomes (Dataphyte, 2023).

Previous studies, such as Nzeribe et al. (2022), have shown that health-focused spending can improve life expectancy, but there is a lack of research specifically examining the role of capital spending on economic services. Most studies focus on economic growth, poverty reduction, or general health indicators, leaving a gap in understanding how investments in economic infrastructure influence life expectancy. Without this knowledge, government resources may be allocated inefficiently, failing to address critical health challenges. This study addresses this gap by analyzing the effect of government capital spending on economic services on life expectancy in Nigeria, using time-series data from 1981 to 2024. The findings will help policymakers understand whether current spending strategies in economic services are effective or require reform to better support health and longevity.

REVIEW OF RELATED LITERATURE

Government Capital Spending

As Africa's most populous country, Nigeria grapples with substantial obstacles in enhancing the health and lifespan of its citizens. Life expectancy, a key measure of a nation's health, is shaped by multiple factors, including government investments in public infrastructure. Capital expenditure, which focuses on long-term investments in physical and institutional assets, is crucial for improving health outcomes. This report investigates the impact of government capital spending on economic services, such as transportation, energy, and water supply infrastructure, on life expectancy in Nigeria, utilizing recent studies and data to explore the relationships and challenges.

Capital Spending on Economic Services

Capital spending on economic services includes investments in infrastructure projects such as transportation networks, energy systems, and water supply facilities. These investments are vital for economic development and have significant implications for public health. Improved road networks facilitate access to healthcare facilities, particularly in rural areas where distance and poor infrastructure often prevent timely medical care. Reliable electricity is essential for operating medical equipment, while clean water supply systems reduce water-borne diseases and support hygiene, both critical for health outcomes. According to The Lancet Nigeria Commission (2022), Nigeria's inadequate transportation infrastructure significantly limits healthcare access, especially in rural regions, contributing to poor health outcomes (The Lancet Nigeria Commission, 2022). For example, poor road access exacerbates maternal health challenges by delaying antenatal care and facility deliveries, which are linked to high maternal mortality rates.

Additionally, the World Bank has noted that Nigeria's infrastructure deficit, including 60 million people lacking access to basic drinking water and 80 million without advanced sanitation facilities, directly impacts health by increasing the prevalence of water-borne diseases (Dataphyte, 2023). Despite these challenges, Nigeria's investment in economic infrastructure remains insufficient, with only 31% of its 195,000 km road network paved, hindering healthcare access and economic productivity. Addressing these infrastructural gaps through increased capital spending is crucial for improving health indicators and life expectancy, though the precise impact in Nigeria requires further research due to limited country-specific studies.

Life Expectancy

Life expectancy at birth, defined as the average number of years a newborn is expected to live based on current mortality rates, is a critical indicator of Nigeria's health status and the effectiveness of its public infrastructure. Despite modest improvements in recent decades, Nigeria's life expectancy remains below the global average. According to the World Bank (2023), Nigeria's life expectancy was 52.68 years in 2021, driven by challenges such as high infant and maternal mortality rates, widespread infectious diseases like malaria and HIV/AIDS, and limited access to quality healthcare services. Other sources report slightly higher estimates, such as 61.79 years in 2023 (Statista) or 62.6 years in 2020 (WHO), reflecting inconsistencies due to differing estimation methods and incomplete mortality data in Nigeria. Key factors contributing to low life expectancy include inadequate infrastructure, such as poor transportation networks, unreliable electricity, and limited access to clean water, alongside socioeconomic issues like poverty and low education levels. Government capital spending on economic services, such as roads, energy, and water supply systems, can play a vital role in addressing these challenges by improving access to healthcare facilities, powering medical equipment, and reducing water-borne diseases. Studies, such as Edeme et al. (2017), suggest that strategic investments in infrastructure can enhance health outcomes and life expectancy by addressing barriers to healthcare access. For instance, improved road networks can reduce delays in reaching medical facilities, potentially lowering mortality rates. However, further research is needed to quantify the precise impact of capital spending on economic services on life expectancy in the Nigerian context.

Theoretical Framework

The present study is anchored on the Human Capital Theory, which emphasizes the importance of investing in people's health, skills, and well-being to foster national development. According to Schultz (1961) and Becker (1964), human capital encompasses the health, knowledge, and abilities of individuals that enhance their productivity and life outcomes. In the context of this study, the theory suggests that government capital expenditure on economic services (such as transportation networks, electricity systems, and water supply infrastructure) can indirectly improve life expectancy by facilitating access to healthcare, reducing health risks, and enhancing living standards. For example, improved roads enable faster access to medical facilities, reliable electricity supports the operation of healthcare equipment, and clean water systems reduce water-borne diseases, all of which contribute to better health outcomes and longer lifespans. As Bloom, Canning, and Sevilla (2004) note, investments in economic infrastructure have a ripple effect on population health, particularly in developing countries like Nigeria, where infrastructure deficits significantly impact healthcare access.

This theory is particularly relevant for understanding how capital expenditure on economic services influences life expectancy in Nigeria. By investing in robust infrastructure, such as paved roads, reliable power grids, and clean water systems, the government can address barriers to healthcare delivery and improve environmental conditions that affect public health. These improvements enhance the quality of life and reduce mortality rates, thereby supporting human capital development and longevity.

The study is also supported by Wagner's Law of Increasing State Activity, which posits that as an economy grows, government expenditure increases, particularly on services that promote

welfare and development (Musgrave & Musgrave, 1989). This theory explains the rising investment in economic services as population demands for better infrastructure grow. In Nigeria, increased capital spending on economic services, such as transport and energy infrastructure, is intended to meet these demands and support public welfare by improving access to essential services like healthcare. When managed effectively, such investments can enhance the reach and efficiency of health-related programs, contributing to improved life expectancy. Wagner's Law complements the Human Capital Theory by highlighting the expanding role of government in addressing societal needs through infrastructure investments, emphasizing the importance of strategic spending in economic services to support human development.

Together, the Human Capital Theory and Wagner's Law provide a robust framework for examining how government capital expenditure on economic services affects life expectancy in Nigeria. The Human Capital Theory links infrastructure investments to improved health outcomes, while Wagner's Law explains the growing government role in funding economic services to meet public needs, offering a comprehensive lens to analyze the impact of these investments on the longevity of Nigerians.

Empirical Review

The body of empirical literature presents diverse perspectives on how government expenditure influences economic growth, poverty reduction, and infrastructure development across different countries and contexts. Aluthge et al. (2021) examined Nigerian government spending, breaking it down into capital and recurrent components. Using the ARDL model, they found that only capital expenditure had a positive and significant effect on economic growth in both the short and long run. In contrast, recurrent expenditure was insignificant. Similarly, Jideofor et al. (2021) employed ARDL to assess the impact of capital expenditure on poverty reduction in Nigeria, revealing that capital spending significantly reduces poverty levels. Zomatic (2021), focusing on Liberia, found a long-run but not a short-run link between government expenditure and growth, emphasizing the importance of sustained budget performance for macroeconomic stability.

Expanding the analysis to Sub-Saharan Africa, Wandeda et al. (2021) adopted a dynamic panel approach using GMM for 35 countries. Their findings suggest that education and health expenditures are vital to income growth, particularly in low-income nations, while military spending appears more impactful in middle-income countries. In Aceh, Indonesia, Yusri (2021) used the Synthetic Control Method to evaluate the Special Autonomy Fund, finding that it improved poverty, sanitation, and education, although no clear link was found with access to safe water. Dahliah (2021) also reported positive effects of government and private investment on economic growth in Makassar City using multiple linear regression, showing localized effectiveness of public spending in fostering development.

Further emphasizing sectoral spending, Ogundipe and Adesola (2022) found that government expenditure on education, agriculture, and health significantly improves the standard of living in Nigeria. Their findings advocate for more budget allocation to these sectors. Similarly, Awoyemi et al. (2023) used ARDL to explore the impact of health expenditure on life expectancy and mortality, confirming that increased spending reduces mortality and enhances

longevity. In the same vein, Nzeribe et al. (2022) revealed that public and private health expenditures, along with corruption and economic growth, significantly influence poverty levels in Nigeria. They found that while health spending worsens poverty, improved human capital and institutions mitigate it.

In agricultural-focused studies, Megbowon et al. (2022) and Ngobeni and Muchopa (2022) analyzed the effectiveness of government spending in boosting agriculture. While Megbowon et al. found agricultural spending insufficient for growth in Lesotho, Ngobeni and Muchopa discovered that spending, when combined with favorable factors like rainfall and population growth, can raise agricultural output. However, food imports and rising prices hinder progress. Nugroho et al. (2022), in a panel study of Indonesian provinces, identified roads and irrigation infrastructure as significant long-term drivers of growth, emphasizing the importance of investing in physical capital to promote regional development. This reinforces the critical role of infrastructure in sustaining economic advancement.

Lastly, Dankumo et al. (2023) offered insights into how governance mediates the impact of public spending on poverty in Sub-Saharan Africa. Using GMM, they discovered that poor governance (characterized by corruption and political instability) exacerbates poverty and weakens the benefits of government expenditure. On a related note, Ibrahim et al. (2023) analyzed the influence of government spending on infrastructure in Nigeria using OLS. Their results support the view that public investment in health, education, and transport infrastructure positively affects national development.

Gap in Empirical Review

Despite extensive research on the effects of government spending on various economic and social outcomes, there remains a significant gap in understanding how government capital spending on economic services impacts life expectancy in Nigeria. Most previous studies, such as Aluthge (2021) and Zomatic (2021), have concentrated on the relationship between government expenditure and economic growth, while others, like Jideofor (2021) and Dankumo (2023), have explored its role in poverty reduction. Research on infrastructure development, such as Ibrahim (2023), often focuses on broad economic impacts rather than specific health outcomes. Although some studies, including Awoyemi (2023) and Nzeribe (2022), have examined public spending on health, they typically combine recurrent and capital expenditures or focus on general health indicators, such as mortality rates, without isolating the effect on life expectancy.

There is a lack of detailed analysis on how capital spending on economic services—encompassing investments in transportation networks, energy systems, and water supply infrastructure—affects life expectancy in Nigeria. These investments are critical for improving access to healthcare facilities, powering medical equipment, and reducing water-borne diseases, all of which can influence health outcomes. The failure to disaggregate capital spending on economic services from other expenditure types limits the understanding of its specific contribution to health and longevity. This study addresses this gap by focusing exclusively on the effect of government capital spending on economic services on life expectancy in Nigeria, using time-series data from 1981 to 2024. By doing so, it provides a

clearer understanding of how long-term infrastructure investments influence the health and lifespan of Nigerians.

METHODOLOGY

This study employed an ex-post facto research design to examine the effect of government capital spending on economic services on life expectancy in Nigeria. The analysis focused specifically on the Nigerian context and utilized secondary data sourced from the Central Bank of Nigeria Statistical Bulletin and the World Bank's World Development Indicators, covering the period from 1981 to 2024. Drawing inspiration from the works of Inyiama and Ezeugwu (2016), this study adopted a regression model to assess the impact of capital expenditure on economic services, such as transportation, energy, and water supply infrastructure, on life expectancy. The regression model was specified as follows:

$$LER_{ti} = \beta_o + \beta_1 GES_{ti} + \beta_2 GSA_{ti} + \beta_3 GSSCS_{ti} + \varepsilon_{ti}$$

Where;

LER	Life Expectancy Ratio
GSE	Government Spending on Economic Services
GSA	Government Spending on Administration
GSSCS	Government Spending on Social and Community Services
ε	Stochastic Disturbance (Error) Term
β_o	Coefficient (constant) to be estimated
$\beta_i - \beta_3$	Parameters of the independent variables to be estimated
t	Current period

DATA PRESENTATION AND ANALYSIS

Table 4.2.1: Descriptive Statistics for the Variables

	LER	LOG(GSE)	LOG(GSA)	LOG(GSSCS)
Mean	49.00914	4.358268	3.641602	3.095758
Median	48.31900	5.465969	4.387604	3.728422
Maximum	54.78930	7.603946	7.046076	6.322319
Minimum	45.48300	-0.421137	-1.336743	-1.437167
Std. Dev.	3.090784	2.449716	2.515626	2.208723
Skewness	0.332203	-0.654083	-0.591355	-0.379822
Kurtosis	1.571001	1.938446	2.064550	1.795622
Jarque-Bera	4.553038	5.203363	4.168759	3.717238
Probability	0.102641	0.074149	0.124384	0.155888
Sum	2156.402	191.7638	160.2305	136.2134
Sum Sq. Dev.	410.7767	258.0478	272.1200	209.7737
Observations	44	44	44	44

Source: Eviews 10.0 Software, 2025

The normality of the distribution of the variables in Table 4.2.1 can be assessed using the values of skewness, kurtosis, and the Jarque-Bera probability. Life Expectancy Ratio (LER) has a skewness of 0.33, indicating a slight positive skew, meaning the distribution has a longer tail on the right side. The kurtosis value for LER is 1.57, which is below the normal value of 3,

suggesting that the distribution is relatively flat or platykurtic. The Jarque-Bera test statistic for LER is 4.55 with a probability of 0.10. Since the probability is greater than the common significance level of 0.05, we do not reject the null hypothesis of normality. This means the distribution of LER can be considered approximately normal. Additionally, the mean (49.00914) and median (48.31900) values of LER are close, further supporting the assumption that the variable is symmetrically distributed.

For the independent variable, government spending on economic services (LOG(GSE)), expressed in logarithmic form, the results also indicate an approximately normal distribution. The skewness value for LOG(GSE) is -0.65, suggesting mild left skewness. Its kurtosis value is 1.94, which is below 3, indicating that the distribution is not sharply peaked. The Jarque-Bera probability for LOG(GSE) is 0.07, which is above the 0.05 threshold, meaning the distribution does not significantly deviate from normality. Therefore, based on the skewness, kurtosis, and Jarque-Bera statistics, both LER and LOG(GSE) are approximately normally distributed, making them suitable for further statistical analysis.

Table 4.2.2: Panel Ordinary Least Square Multiple Regression Analysis (LER)

Variable	Coefficient	Standard Error	t-Stat	p-Value
LOG(GSE)	-1.012068	0.365237	-2.770989	0.0084
LOG(GSA)	0.075294	0.455923	0.165146	0.8697
LOG(GSSCS)	2.250671	0.467582	4.813423	0.0000
C	46.17828	0.482779	95.65092	0.0000

$R^2 = 0.836982$, Adjusted $R^2 = 0.824756$, F-Stat 68.45730, Prob(F-stat) = 0.000000, DW = 2.29

Source: Eviews 10.0 Output, 2025

The results from the ordinary least squares regression in Table 4.2.2 show how government capital spending on economic services affects life expectancy in Nigeria. For LOG(GSE), which represents government spending on economic services, the coefficient is -1.012068. This indicates that a 1 percent increase in spending on economic services leads to a decrease in life expectancy by approximately 1.01 units. The p-value is 0.0084, which is below the 0.05 significance level, indicating that the result is statistically significant. This suggests that increasing capital spending on economic services, such as transportation, energy, and water supply infrastructure, has a negative effect on life expectancy within the period studied. The constant term (C) is 46.17828 with a p-value of 0.0000, indicating that it is highly significant and that other factors not included in the model also contribute positively to life expectancy. The R-squared value of 0.837 indicates that about 84 percent of the variation in life expectancy is explained by the model. The adjusted R-squared, which accounts for the number of variables, is 0.825, reflecting a strong fit. The F-statistic is 68.4573 with a p-value of 0.000000, confirming that the overall model is statistically significant. The Durbin-Watson value is 2.29, which is close to 2, suggesting there is no serious autocorrelation in the model.

Test of Hypotheses
Based on the regression results in Table 4.2.2, we can formulate and test the hypotheses of the study on the effect of government capital spending on life expectancy in Nigeria. The three

independent variables are government capital spending on administration (LOG(GSA)), economic services (LOG(GSE)), and social and community services (LOG(GSSCS)). The dependent variable is life expectancy ratio (LER). The hypotheses are formulated as follows:

H_{02}: Government capital spending on economic services has no significant effect on life expectancy in Nigeria.

H_{12}: Government capital spending on economic services has a significant effect on life expectancy in Nigeria.

Decision: The p-value for LOG(GSE) is 0.0084, which is less than 0.05. Reject the null hypothesis. This means that government capital spending on economic services has a significant effect on life expectancy in Nigeria. The effect is negative.

DISCUSSION OF FINDINGS

The findings of the current study reveal that government capital spending on economic services has a negative and significant impact on life expectancy in Nigeria. The regression results indicate that a 1 percent increase in spending on economic services, such as transportation, energy, and water supply infrastructure, leads to a decrease in life expectancy by approximately 1.01 units, with a statistically significant p-value of 0.0084. This unexpected negative effect could be attributed to issues such as poor project implementation, corruption, misallocation of resources, or a focus on infrastructure projects that do not directly or immediately improve health outcomes. Economic services often encompass investments in roads, electricity, and water systems, which are intended to enhance access to healthcare and reduce health risks. However, if these projects are mismanaged, delayed, or diverted, they fail to deliver the anticipated benefits. This finding is supported by Megbowon et al. (2022), who noted that agricultural spending in Lesotho did not contribute to growth due to inefficiencies, and Ngobeni and Muchopa (2022), who emphasized that infrastructure spending requires favorable economic and environmental conditions to yield positive results. The results suggest that economic service spending in Nigeria may not be strategically directed or efficiently utilized to support human development in the short term.

The negative impact of economic service spending on life expectancy may also be influenced by governance challenges. As highlighted by Dankumo et al. (2023), corruption, weak institutions, and political instability can undermine the effectiveness of government expenditure. If funds allocated to economic services are not transparently managed or are captured by elites, they fail to benefit the wider population. This aligns with the findings of Nzeribe et al. (2022), who argued that public spending must be supported by strong governance and institutional quality to achieve meaningful improvements in welfare. For instance, Nigeria's infrastructure deficits, such as only 31% of its 195,000 km road network being paved and 60 million people lacking access to basic drinking water (Dataphyte, 2023), highlight the challenges in translating economic service investments into health benefits.

These results are comparable to regional findings by Wandeda et al. (2021), who demonstrated that spending on sectors directly tied to human development, such as health and education, is more effective in low-income countries like Nigeria. The study suggests that economic service

spending may need to be reoriented to prioritize infrastructure projects that directly support health outcomes, such as improving rural road networks to enhance healthcare access or ensuring reliable electricity for medical facilities. This study underscores the need for improved governance, better project implementation, and strategic allocation of economic service spending to ensure it contributes positively to life expectancy and human development in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study examined the effect of government capital spending on economic services on mortality rate in Nigeria. The findings revealed that spending on economic services, such as transportation, energy, and water supply infrastructure, has a negative and significant effect on life expectancy, suggesting issues of inefficiency, poor project execution, or misallocation of resources. Based on these results, it is recommended that the Nigerian government enhance the monitoring and management of funds allocated to economic services to ensure they deliver tangible benefits to the population. Strategic investments in infrastructure that directly support health outcomes, such as improved rural road networks to facilitate healthcare access or reliable electricity for medical facilities, should be prioritized to reverse the negative impact on life expectancy.

This study contributes to existing knowledge by demonstrating that capital spending on economic services does not currently improve life expectancy in Nigeria, highlighting the need for better implementation and governance. While many studies have focused on economic growth or poverty, this research provides a clearer understanding of how economic service spending decisions affect health and well-being. Future researchers can build on this work by using more recent data, extending the time frame, or comparing Nigeria with other African countries. Additionally, investigating how corruption, governance quality, and the effectiveness of economic service spending influence life expectancy, beyond just the amount spent, could offer deeper insights into optimizing public expenditure for improved health outcomes.

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