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Transportation and Economic Growth in Nigeria: An Assessment of Road and Rail Post Courier Services (1986 – 2024)

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Abstract

Transportation is a critical driver of economic growth, facilitating trade, investment, and regional integration. However, in Nigeria, the road and rail transport sectors have remained largely underdeveloped, hindering economic productivity and competitiveness. As such, this paper seeks to assess transportation and economic growth in Nigeria: an assessment of road and rail from 1986 to 2024. The paper employed ex-post facto research design, using secondary time series data sourced from Central Bank of Nigeria (CBN) statistical Bulletin. Dynamic OLS model was used for data analysis. The result revealed that road transport was found to have a positive and significant influence on economic growth in Nigeria. Similarly, rail transport and post and courier services were revealed to have a positive but insignificant impact on economic growth in Nigeria. The paper therefore recommended that; the government, through Federal Ministry of Transportation, Federal Road Maintenance Agency (FERMA), and Federal Road Safety Corps (FRSC) should prioritize improving infrastructure, reducing congestion, and investing in technology and systems that enhance efficiency in these sectors to strengthen its implementation. This would help in stimulating economic growth and improve connectivity, since road transport appears to have a positive and statistically significant impact on economic growth (RGDP) in Nigeria. The government through the Nigerian Railway Corporation (NRC), infrastructure Concession Regulatory Commission (ICRC) and National Environmental Standards and Regulations Enforcement Agency (NESREA) should focus on reforming these subsectors by addressing rail infrastructures and train stations, improving operational efficiency. By doing so, could yield to a significant contribution to the country's GDP in the future, thus fostering long-term economic growth. The government through Nigerian Postal services (NIPOST), the Ministry of Communications and Digital Economy and Courier and Logistics Regulatory Department (CLRD) should actively promote the use of postal and courier services among Nigerians. Also, efforts should be made to strengthen the operations and service delivery of these agencies in order to enhance customer satisfaction.

Keywords: *Economic growth, Transportation, Policy Designs, Road transport and Nigeria*

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Background to the Study

The fundamental benefit transportation has on economic growth to facilitate the movement of goods, services and people across regions in different areas. Transport infrastructure globally has been key industrialization driver, urbanization and expansion of the economy. Particularly the road and rail transport have been a critical driver in trade advancement, reducing the time for traveling and productivity enhancement. Well developed countries transportation networks tend to exhibit higher growth rate of the economy due to efficiency of improved logistics. According to Okoko (2021) that transport is a necessary ingredient in all aspects of economic and social development. Road transport in Nigerian today accounts for more than 90% of the country's goods and passenger movement (Filani, 2020; Oni, 2024). This shows the importance of road transportation to the economy of the country.

Transportation is a critical driver of economic growth, facilitating trade, investment, and regional integration. However, in Nigeria, the road and rail transport sectors have remained largely underdeveloped, hindering economic productivity and competitiveness. Despite various government initiatives and policy interventions since 1986 like National Transport Policy of 1993, Vision 2010 in 1997, National Economic Empowerment and Development Strategy (NEEDS) of 2004, Road Sector Development Team (RSDT) in 2005, Nigerian Railway Modernization Project (2006–Present), Transformation Agenda (2011–2015), Presidential Infrastructure Development Fund (PIDF) (2018), Economic Recovery and Growth Plan (ERGP) (2017–2020), Nigeria Integrated Infrastructure Master Plan (NIIMP) (2014–2043), National Development Plan (2021–2025).

Nigeria's road network, although extensive, is plagued by poor maintenance, congestion, and inadequate connectivity, limiting the efficient movement of goods and people. Movement along roads may be by bike or automobile, truck, or by animal such as horse or oxen (Akintola, 2020). Similarly, the rail sector, which once played a vital role in economic activities, suffered decades of neglect, leading to a drastic reduction in its contribution to transportation and trade. Although recent efforts have been made to revive rail transport through investments in standard gauge projects, the overall impact on economic growth remains limited due to inconsistent implementation, funding constraints, and operational inefficiencies. According to the National Bureau of Statistics (NBS), the transport sector's contribution to Nigeria's Gross Domestic Product (GDP) has experienced fluctuations in recent years. In the second quarter of 2023, transport activities contributed 1.35% to nominal GDP, a decrease from 2.79% in the same period of 2022. This decline was attributed to factors such as the removal of the petrol subsidy, which led to increased fuel prices and higher transportation costs.

In real terms, the transport and storage sector grew by 3.33% in the first quarter of 2024, marking a recovery from previous contractions. The sector's contribution to real GDP was 1.18%, consistent with the previous year. Road transport dominates the Nigerian transport sector and significantly contributes to GDP. In 2020, it contributed approximately ₦2.4 trillion (about $6.4 billion), although this was a decline from ₦2.7 trillion ($7.2 billion) in 2019. However, by 2022, the overall transport sector's share of GDP dropped from 17.1% in 2021 to 2.5% (Business Day, 2023). Rail Transport: Rail transport continues to contribute minimally

to GDP. In Q4 2022, it accounted for just 0.03% of the transport sector's real GDP (Naira metrics, 2023). Although there has been an increase in rail usage and revenue in recent years, the sector remains underutilized compared to its potential.

Comparatively, countries such as China, India, and South Africa have made significant progress in enhancing their road and rail transport systems, leading to increased economic productivity, reduced transportation costs, and improved regional trade. Nigeria, on the other hand, has not achieved similar progress, raising concerns about the effectiveness of its transport policies and investments. The persistent challenges in the sector have led to higher costs of doing business, reduced foreign direct investment inflows, and slower economic growth. This study seeks to assess the transportation and economic growth in Nigeria: an assessment of road and rail from 1986 - 2024. The study therefor seeks to identify the key challenges and policy gaps that have hindered sustainable transport development and economic Expansion in Nigeria. The study tested following hypothesis based on the objectives of the study.

H_{01}: Road transport has no significant impact on economic growth in Nigeria,
H_{02}: Rail transport has no significant impact on economic growth in Nigeria.
H_{03}: Post and courier services have no significant impact on economic growth in Nigeria.

Literature Review and Conceptual Clarification

Transportation

Transportation is a fundamental component of economic and social development, facilitating the movement of people, goods, and services across different locations. It serves as a crucial link between production and consumption, ensuring the efficient distribution of resources, trade expansion, and regional integration. The transportation sector encompasses various modes, including road, rail, air, and water transport, each playing a distinct role in economic activities (Rodrigue, 2023). Among these, road and rail transport are particularly significant in developing economies like Nigeria, where they serve as the backbone of domestic and regional trade. Efficient transportation systems contribute to economic growth by reducing transaction costs, improving market accessibility, and enhancing productivity. Infrastructural investments in road networks, rail lines, and logistics services facilitate industrial development and attract foreign direct investment (World Bank, 2024).

Road transport

Road transport refers to the movement of goods and passengers on roads using vehicles such as cars, trucks, buses, motorcycles, bicycles, and pedestrians. It is a fundamental component of land transportation systems, providing flexibility and accessibility in connecting various locations (Farquharson *et al.* (2021). Unlike other transport modes, road transport offers door-to-door service, allowing users to determine routes, schedules, and speeds according to their specific needs (Udemgba *et al.,* 2023). This adaptability makes it indispensable for short to medium-distance travel and the distribution of goods within urban and rural areas. The infrastructure supporting road transport includes a network of roads, highways, and streets, each designed to accommodate different traffic volumes and vehicle types (Okeke *et al.* 2023).

Properly maintained road networks are crucial for ensuring safety and efficiency in transportation. However, challenges such as traffic congestion, road safety concerns, and environmental impacts like air pollution and noise pollution are associated with road transport. Addressing these issues requires comprehensive planning and investment in infrastructure maintenance and development.

Rail Transport

Rail transport, also known as train transport, involves the movement of passengers and goods using wheeled vehicles running on rail tracks has been a pivotal component of Nigeria's transportation infrastructure (Adegoriola *et al.* 2018). This mode of transportation is characterized by vehicles that are directionally guided by the tracks on which they run, typically comprising steel rails. The fundamental components of rail transport include the rolling stock (such as locomotives and carriages) and the infrastructure (including tracks, stations, and signaling systems) (Daramola, 2022). One of the primary advantages of rail transport is its energy efficiency. Trains encounter lower frictional resistance compared to road vehicles, allowing for the movement of heavy loads over long distances with relatively less energy consumption (Oluwakoya & Ogundipe, 2021). This efficiency translates to cost-effective transportation, particularly for bulk commodities and large numbers of passengers. Additionally, railways offer high levels of safety and reliability, with trains operating on fixed schedules and dedicated tracks, minimizing the risks associated with road transport (Bassey *et al.* 2022)

Post and Courier Services

Post and courier services are essential components of a nation's communication and logistics infrastructure, facilitating the exchange of correspondence and the delivery of goods. These services utilize various transportation modes, notably road and rail, to ensure timely and efficient distribution. Road transport is a cornerstone of postal and courier operations, offering flexibility and direct access to a wide range of destinations. Vehicles such as vans, trucks, and motorcycles are commonly employed to collect and deliver mail and parcels, enabling door-to-door services. The adaptability of road transport allows for the accommodation of varying delivery schedules and the handling of diverse package sizes. However, challenges such as traffic congestion and environmental concerns have prompted the exploration of alternative solutions, including the integration of electric vehicles and optimized routing strategies to enhance efficiency and sustainability. Rail transport has historically played a significant role in postal services, particularly for long-distance and bulk mail transportation.

Economic Growth

Economic growth refers to the sustained increase in the production of goods and services within an economy over time. It is one of the most important indicators used to assess a country's economic development and prosperity. Growth is typically measured using Gross Domestic Product (GDP), which represents the total value of goods and services produced over a specified period. Other indicators include per capita income, employment rates, and levels of investment in key sectors (Ayoola & Yusuf, 2023). Economic growth plays a fundamental role in improving the quality of life by generating employment opportunities,

increasing household incomes, and expanding access to essential goods and services. It fosters technological advancements, stimulates investment, and promotes trade and industrialization (Banerjee & Heffner, 2020). Sustained growth can also enable governments to invest more in critical areas such as healthcare, education, and infrastructure, further strengthening national development. Several theoretical models explain the mechanisms through which economic growth occurs.

Theoretical Framework

This paper utilises Growth Pole Theory propounded by François Perroux in 1955. The theory was later expanded by regional economists such as Albert Hirschman (1958) and Gunnar Myrdal (1957), who explored how industrial development leads to economic expansion in specific locations before spreading to surrounding areas. The Growth Pole Theory argues that economic development does not occur uniformly across regions but is concentrated around dynamic centers of economic activity, called growth poles. These poles are industries, cities, or regions with strong economic potential that stimulate growth in surrounding areas through backward and forward linkages (Perroux, 1955). The Mathematical Representation of the Theory can be expressed as;

$Y=f(GP,T,L,I)$ ..... (1)

Where Y is Economic growth, GP is Growth poles (urban centers, industrial zones), T is Transportation infrastructure (road and rail networks), L is Labor mobility and migration, I is Investments in infrastructure and industries

Empirical Review

Umoh and Effiong (2024) evaluated the Contribution of Nigeria's Transport Sector to Economic Growth from 1970 to 2023. Utilizing regression analysis, specifically the ordinary least squares method. The findings indicated that the existing literature on economic growth models offered valuable insights for policymakers and stakeholders in the transport industry, highlighting the critical role that transportation plays in driving economic growth in Nigeria. While they recommended that, the federal government significantly increase its investment in the transportation sector to enhance its contributions to economic growth. Emphasizing the need for a diversified transportation network, the researcher highlighted the importance of developing alternative modes of transport, such as railways and water transport infrastructure.

In another studies, Ogunbiyi and Abalubu (2024) investigated the intricate relationship between railway transportation and the economic performance of Nigeria, from 1997 to 2022. The econometric model, incorporating advanced techniques such as the Autoregressive Distributed Lag framework. The findings revealed a complex interplay between railway operations and economic indicators. Passengers Carried and Freights - TON exhibit varying impacts on GDP, suggesting the need for targeted strategies to optimize both passenger and freight transportation. Investment in railway infrastructure emerges as a critical factor, demonstrating its potential to stimulate economic growth. However, the study underscored the importance of effective revenue generation within the railway sector to ensure long-term financial sustainability.

Also, by using Autoregressive Distributed Lag (ARDL), Nenavath (2023) showed a long run and causal association between economic growth and transport infrastructure through the period 1990 to 2020 to investigate the relationship between transport infrastructure and economic growth in India. Further findings showed that infrastructure have a positive impact on economic growth in India for the long run. Moreover, Granger causality test demonstrates a unidirectional relationship between transport infrastructures to economic development. Stimulatingly, the study highlighted the effect of air infrastructure statistically insignificant on economic growth in the long and short-run period.

Zhang and Cheng (2023) investigated the relationship between transport infrastructure development and economic growth in the UK from different time spans. The study then applied on Vector Error Correction Model (VECM) to investigate both long-run and short-run relationships between transport infrastructure development and economic growth from 1970 to 2017 in the UK. Empirical results suggested that transportation infrastructure has a long-run promotive effect on economic development. However, in the short run, this effect turns out to be significantly negative. The analysis of this study indicated differentiated roles that the UK's transport infrastructure played in economic growth, which should be considered in future policy design of achieving economic sustainability in the UK.

Alaba and Charles (2023) also investigated the impact of road transportation on economic growth in Nigeria from 1985 to 2022. A multivariate regression model was adopted and ordinary least square estimation technique was used in estimating the regression model. Annual time series data were collected from the Central bank of Nigeria and the Nigerian Bureau of Statistics. The empirical findings from the study showed that road transportation had significant impact on economic growth in Nigeria during the period under review while the Granger causality test results showed unidirectional causality between real gross domestic product and government expenditure on road infrastructure.

Ehighebolo and Akokhia (2023) explored the relationship between the transportation sector and economic growth in Nigeria while focusing on four key subsectors: from 1981 to 2020. Eagle-Granger Co-integration and the Error Correction Model (ECM) was adopted. The findings revealed that each transportation subsector has a distinct impact on Nigeria's economic performance. First, road transport has a positive and significant impact on GDP, indicating that improvements in road infrastructure, better traffic flow, and the enhanced movement of goods and services via road transport contribute significantly to economic growth. The study underscored the importance of continued investment in road infrastructure to support long-term economic growth similarly, air transport also shows a positive and significant relationship with GDP, reflecting the crucial role of aviation in enhancing trade, connectivity, and business activities both domestically and internationally.

Odesanya (2023) evaluated the performance of Rail and Pipeline Transport (RPT) in Nigeria between 1981 to 2019, Pearson product correlation analysis was adopted. The findings showed that amongst all the transport modes listed i.e. (Road Transport (RT) with the highest correlation of 1.00, Water Transport (WT) with 0.958. Air Transport (AT) with 0.993,

Transport Services (TS) with 0.960 and Logistical transport Services (LS) with 0.860) contribute more to RGDP than the Rail and Pipeline Transport sector which performed with a negative correlation of - 0.245 to the economy. The paper recommended that the Federal government should invest more in this sub-sector and allow private hands to run its administration.

Anokwuru and Chidinma (2023) investigated the influence of transport and communications expenditure on economic growth in Nigeria from 1980 to 2020. The Autoregressive Distributed Lag (ARDL) technique was used as the main analytical tool. The result of ARDL Bounds test revealed the existence of long run association among the variables. The finding revealed that in the long run, both capital and recurrent expenditure on transport and communications sector have positive and insignificant relationship with economic growth. At the same time, interest rate exhibited negative and insignificant relationship with economic growth; while inflation rate displayed a negative and significant relationship with economic growth.

Ohalete *et al.* (2023) investigated economic role of transportation infrastructure and Investment in Nigeria from 1980 to 2021. As the study employed an ARDL model. The findings revealed a consistent and positive correlation between transportation infrastructure investment and economic growth. This influence persists over time, indicating the enduring impact of such investment on the economy. In conclusion, the research highlighted the pivotal role of transportation infrastructure investment in driving economic growth in Nigeria. Policymakers are urged to prioritize sustained investment in this sector to stimulate growth, job creation, and overall prosperity.

Ogochukwu *et al.,* (2022) assessed the performance of railway transportation in these two managerial options in Nigeria from 1970 and 2010. The data were analyzed using simple descriptive statistics and ANOVA. The results revealed a significant difference in the performance of railway transportation between the two management options. Whereas a marginal increase in performance was observed during concession, a drastic decline in performance occurred in the public management era under NRC. It was also observed that there was no statistically significant difference in the performance of railway transportation across the geo-political zones in the country. These results implied that poor management is one of the principal factors that had affected the performance of the railway industry in the country in the period under review.

Alam *et al.,* (2021) examined the relationship between transport infrastructure and economic development in Pakistan. An autoregressive distributive lag (ARDL) and vector error correction model (VECM) was applied over the period 1971–2017. The results indicated that there is a long-run and causal relationship between transport infrastructure and economic development. Transport infrastructure has long-run positive impact on economic development. Furthermore, Granger causality test shows a unidirectional causality in long-run running from transport infrastructure to economic development. Interestingly, the impact of air infrastructure on economic development is statistically insignificant in long-run and short-run.

Ishola and Olusoji (2020) extended previous empirical studies on service-industrial sector interactions and their impact on growth. It provided evidence from quarterly time series data using OLS, from 2010 to 2016 to account for new subsectors introduced from 2010 following the rebasing of the Nigerian economy. The results indicated that while both services and the industrial sector contributed significantly to the economic growth (GDP) of Nigeria, some subsectors i.e. public administration, professional, scientific and technical services, transport (road, rail, pipeline, air, water), utilities (electricity, gas, and water supply, sewage, waste management) were found to be deficient. Finally, the study drew some policy implications to further strengthen the service and industrial sectors to maximise the potentials therein through the prescription of sector-specific policies. In another studies,

Adegoriola *et al.* (2018) investigated the impact of rail freight and passenger's volume on economic growth in Nigeria (1970-2017). The estimation technique employed for the time series data was Error Correction Model (ECM). The results showed that, there is long-run equilibrium relationship between the key variables, Gross Domestic Product (GDP), Volume of Freight (VOF) and Volume of Passengers (VOP). ECM also had the expected negative sign and is between the accepted region of less than unity. The result showed VOP has a positive relationship with GDP but does not have significant impact on GDP. VOF has a negative relationship but has significant impact on GDP.

Nwosu and Elikwu (2022) investigated the economic security implications of rail transport operations in Nigeria, with specific focus on the present rail transport system in South East Nigeria. Survey research design was adopted, which supported the use of primary data obtained from the study sample of 124 and 276 respondents in Enugu and Port Harcourt clusters respectively. The Ordinary Least Squares (OLS) statistical regression analysis was adopted and findings shows that rail in south East has negatively affect economic security causing job losses. The study recommended a complete revitalization of rail infrastructure in the south east.

Ekeocha *et al.* (2022) examined the effects of both aggregate and disaggregated infrastructural on Economic performance in Africa. The study used the dynamic system GMM framework and found that both aggregate and disaggregated infrastructural positively impact GDP per capita growth in Africa, while trade has a muted effect. The study concluded that through effective public administration, African leaders and policymakers can promote economic performance on the continent by evolving policies that favour increased infrastructural development, human capital development and capital accumulation.

Methodology

The time series ex-post facto research design was implemented in this study, a method frequently employed to examine the potential influence of the independent variable(s) on the dependent variable. The ex-post facto research design is a method that identifies previous events and current conditions. It then collects data to investigate the potential relationship between the independent and dependent variables, establish the effect of the independent variable(s) on the dependent variable, and identify factors that influence the dependent

variable in the model. Consequently, the ex-post facto design was implemented to ascertain and transportation and economic growth in Nigeria. The study adopted and reframed the model by Alam *et al.* (2021) examined the relationship between transport infrastructure and economic development in Pakistan and the functional relationship model is stated as:

$$GDP = f(Trade, Road, Rail, Airport, Ports) \quad \ldots\ldots\ldots (1)$$

Where: GDP = GDP per capita, which is used as a proxy for economic development, Trade = value of all goods and other market services provided to the rest of the world, Road = Total length of roads as road infrastructure, Rail = Total length of track kilometers, Air = number of flight take offs, Ports = Total cargo handled.

The modified model of this paper is given as:

$$lnRGDP_t = \beta_0 + \beta_1 lnRDTP_t + \beta_2 lnRLTP_t + \beta_3 lnPCS_t + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: ln = natural logarithm; RGDP = Real gross domestic product representing economic growth; RDTP = Road Transport; RLTP = Rail Transport; PCS = Post and Courier Services; β_0 = Constant parameter; β_1, β_2, β_3 = Coefficient of road transport (RDTP), rail transport (RLTP) and post and courier services (PCS), ε_t : Error term.

A priori Expectation

β_1 > Coefficients of Road Transport variable is expected to have positive impact on Real gross domestic product representing economic growth in Nigeria.

β_2> Coefficients of Rail Transport is expected to have positive impact on Real gross domestic product representing economic growth in Nigeria.

β_3> Coefficients of Post and Courier Services is exp ected to have positive impact on Real gross domestic product representing economic growth in Nigeria.

The paper used the Dynamic Ordinary Least Squares to examined transportation and economic growth in Nigeria: An assessment of road, rail and post courier services Thus, building equations (2) into the DOLS model, we have:

$$lnRGDPt = \beta o + \sum_{t=i}^{p}(\beta 1 \ln RDTPt - i) + \sum_{t=i}^{p}(\beta 2 \ln RLTPt - i) + \sum_{t=i}^{p}(\beta 3 \ln PCSt - i) + \sum_{t=i}^{p}(\beta 4 \Delta \ln RGDPt - i) + \sum_{t=i}^{p}(\beta 5 \Delta \ln RDTPt - i) + \sum_{t=i}^{p}(\beta 6 \Delta \ln RLTPt - i) + \sum_{t=i}^{p}(\beta 7 \Delta \ln PCSt - i) + \varepsilon t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Equation (3) represents the long-run relationship between RGDPGR and the explanatory variables using the DOLS methodology. The coefficients $\beta_1 - \beta_4$ give insights into how each of the explanatory variables impacts economic growth in Nigeria.

Data Presentation Analysis

The findings of this paper are presented in several phases. Initially, descriptive statistics are provided to examine the mean, standard deviations, and autocorrelation properties of the

dataset, establishing a baseline for further analysis. Following this, a Unit Root test is conducted to evaluate the stationarity of the series, determining whether the variables exhibit consistent behavior over time. Subsequently, the Dynamic Ordinary Least Square (DOLS) model and post-estimation tests are applied, with the results offering insights into the relationships and dynamics among the variables under investigation. The descriptive statistics are presented in Table 1.

Table 1: Descriptive Statistics

	LRGDP	LRTT	LRTP	LPCS
Mean	10.55504	5.882529	-1.587367	2.100561
Maximum	11.28763	6.857378	1.896688	3.118626
Minimum	9.751533	4.975064	-3.104932	0.985446
Std. Dev.	0.530232	0.659923	1.449496	0.727930
Skewness	-0.007092	-0.084665	1.237330	-0.185896
Kurtosis	1.387329	1.329669	3.151358	1.360602
Jarque-Bera	4.226478	4.580350	9.988634	4.592015
Probability	0.120846	0.101249	0.006776	0.100660
Observations	39	39	39	39

Source: Authors Computation, (Eviews-10), 2025

The descriptive results presented in Table 1 indicates that Nigerian economic growth proxied by RGDP during the period of 39 years (1986-2023) had minimum and maximum values of 9.751533% and 11.28763% respectively. RGDP averaged 10.55504% during the period with a standard deviation of 0.530232%, implying that the data deviated from both sides of the mean by 8.914728%. This implies that RGDP was relatively widely dispersed during the period of study. The implication of this disparity shows fluctuations in RGDP, which have relatively remained poor over the years. Skewness, which measures the shape of the distribution, revealed that a coefficient of -0.007092 (which is less than zero) implied that, RGDP is negatively skewed, it is symmetrical around the mean, thus deviating from the normal distribution. With a kurtosis value of 1.387329, it implied that RGDP is platykurtic (fat or short-tailed), meaning that the distribution is not peaked relative to the normal distribution. The descriptive normality results also showed that RGDP was normally distributed. This was captured by the Jarque-Bera probability value of 0.120846, found to be greater than 0.05.

Similarly, road transport further revealed the minimum and maximum values as 4.975064% and 6.857378% respectively. Road transport averaged 5.882529% during the period with a standard deviation of 0.659923% implying that the data deviated from both sides of the mean by 13.451548%. This suggests that road transport in Nigeria was relatively widely dispersed during the period of study. Skewness, which measures the shape of the distribution, revealed that a coefficient of -0.084665% (which is less than zero) implied that, road transport is negatively skewed, it is symmetrical around the mean, thus deviating from the normal distribution. With a kurtosis value of 1.329669%, it implied that road transport is platykurtic (fat or short-tailed), meaning that the distribution is peaked relative to the normal distribution. The descriptive normality results also showed that road transport was normally distributed.

This was captured by the Jarque-Bera probability value of 0.101249, found to be greater than 0.05.

In addition, the ratio of rail transport during the period under review had the minimum and maximum percentage values of -3.104932% and 1.896688%, respectively. The average of rail transport disbursed during the period is -1.587367% with a standard deviation of 1.449496%. The co-efficient of skewness of 1.237330 suggests that the rail transport data is positively skewed. With a kurtosis value of 3.151358, it implies that rail transport leptokurtic (slim or long-tailed), meaning that rail transport is not normal distribution. The p-value of 0.006776 for Jarque-Bera implied that money supply was not normality distributed at 5%.

Lastly, post and courier services revealed the minimum and maximum values as 0.985446% and 3.118626% respectively. Post and courier services averaged 2.100561 during the period with a standard deviation of 0.727930% implying that the data deviated from both sides of the mean by 17.196746%. Skewness, which measures the shape of the distribution, revealed that a coefficient of -0.185896% (which is less than zero) implied that, post and courier services is negatively skewed, it is symmetrical around the mean, thus deviating from the normal distribution. With a kurtosis value of 1.360602%, The descriptive normality results also showed that post and courier services was normally distributed. This was captured by the Jarque-Bera probability value of 0.100660, found to be less than 0.05.

Table 2: Unit Root Test Results

Variables	ADF Test Statistics	Critical ADF Test Statistics (p-value)	Order of Integration
LRGDP	-3.975365	-2.943427**(0.0040)	*I* (1)
LRDTP	-7.667801	-2.943427**(0.0000)	*I* (1)
LRLTP	-5.058673	-2.943427**(0.002)	*I* (1)
LPCS	-5.820570	-2.943427**(0.0000)	*I* (1)

Source: Authors Computation, (Eviews-10), 2025

The results in table 2 revealed that RGDP was not found to be stationary at level, as its ADF statistic values are lesser than their critical value with their probabilities greater than 5% level of significance. However, given the ADF test statistics of -3.975365, which is more negative than the critical value and the p-value of 0.0040which is less than 5% significant of level. This implies that RGDP is integrated at order one [I (1)].

Similarly, road transport (RTT) became stationery at first differencing, as indicated by the ADF test statistics of -7.667801 and its associate p-value of 0.0000, which more negative than critical value and less than 5% significant of level. Therefore, road transport (RDTP) is integrated at order one [I(1)]. Furthermore, rail transport (RLTP) was found to be stationery at first difference with ADF test statistics of -5.058673 with the p-value of 0.0002, which is greater that than critical value and lower than 5% significant of level. This implies that rail transport (RTP) is integrated at order one [I(1)]. Lastly, Post and courier services (PCS) was

found to be stationery at first difference with ADF test statistics of -5.820570, which is greater that than critical value with the p-value of 0.0000 which is less than 5% significant of level. This implies that post and courier (RPC) is integrated at order one [I(1)]. Results in Table 3 revealed that all the variables were integrated at order one 1(1). This implies that they were not stationary at the level until they were differenced once and they were said to be integrated of order one 1(1).

Dynamic OLS (DOLS) Regression Results

The Dynamic Ordinary Least Squares (DOLS) Regression findings for the model are shown in Table 3 to provide some intriguing insights into the direct influences of transportation and economic growth in Nigeria from 1896-2024.

Table 3: Dynamic Ordinary Least Squares (DOLS) Result
Dependent Variable: RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LRDTP	0.577938	0.104432	5.534119	0.0001
LRLTP	0.003322	0.011921	0.278687	0.7843
LPCS	0.191321	0.095583	2.001625	0.0638
C	6.802866	0.423120	16.07785	0.0000
R-squared	0.995605			
Adjusted R-squared	0.990331			
S.E. of regression	0.048083			

Source: Authors Computation, (Eviews-10), 2025

From table 3, revealed the four explanatory variables used in this paper have statistically significant influence on economic growth in the long run. By implications, road transport, rail transportation and post and courier services are important in explaining economic growth in Nigeria throughout the research period. Road transport, rail transportation and post and courier services are consistent with the *a priori expectation* of this paper.

On a basis of variable-by-variable analysis, the paper found that road transport has positive impact on RGDP. In other words, road transport has direct relationship with economic growth in Nigeria for the study period. This implies that a unit increase road transport will lead to approximately 57.79% in the economic growth of Nigeria in the long run. Indicating that improvements in road infrastructure, better traffic flow, and the enhanced movement of goods and services as road transport plays a vital role in boosting economic growth. This outcome is consistent with the a priori expectations of the investigation and prior studies such as Alaba and Charles (2023) whose study found out that road transportation had significant impact on economic growth in Nigeria.

On the other hand, the findings indicated that rail transport appeared to have impact on economic growth but statistically significantly in the long-run. This implies that a unit increase in rail transport will bring about 0.33% increase in the Nigerian economic growth in the long

run. This result revealed that more attention needs to be given to rail transport by channeling more funds in order to make it reliable and accessible to boost transportation system in Nigeria. This outcome is consistent with the a priori expectations of the research. The findings are in line other researches like Ogunbiyi and Abalubu (2024) who revealed a complex interplay between railway operations and economic indicators.

Furthermore, the results indicated that post and courier services have positive but insignificant on economic growth in the long run. This implies that 1% increase in the amount of post and courier services will lead to 19.13% increase in economic growth in the long run. This is attributed to the sector's role in job creation and its contribution to the efficient transportation of goods, documents, and packages all of which support and stimulate economic activity. This outcome is consistent with the a priori expectations of the paper and is in line other papers like:

The R-squared value of 0.995605 implies that the model is a good fit as over 99% variation in economic growth is explained by the explanatory variables. Even after removing the impact of insignificant estimators, the adjusted R-squared value of 0.990331 implies that the model is still very good. Therefore, the paper's conclusions can be relied upon for formulating policy recommendations.

Table 4: Serial Autocorrelation, Heteroskedasticity and Normality Tests

	X^2	**Probability**
Breusch-Godfrey Serial Correlation LM Test:	2.422923	0.1275
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.331348	0.9860
Heteroskedasticity test: ARCH	8.353637	0.0014
*Jarque-Bera test	13.30445	0.001291

Source: Authors Computation, (Eviews-10), 2025

The normality test result reveals that the sample variance is normally distributed since Jaque-Bera probability is statistically insignificant. The Table 4 revealed that the variables are free from problem serial correlation since the F-statistics is 2.422923 and the P- value of 0.1275, which is greater than 5% level of significance. This outcome revealed the absence of serial correlation in the model. Similarly, the Heteroskedasticity results shows that variables are free from the problem of Heteroskedasticity since the F-statistics of 0.331348 and the P-value of 0.9860 are greater than 5% level of significance. This outcome revealed the absence of Heteroskedasticity in the model. Furthermore, the result of ARCH shows that the variable from ARCH effect given the F-statistics value of 8.353637 and the P-value of 0.0014 which are less than 5% level significance. This outcome revealed that there is ARCH effect in the model. Lastly, Jarque-Bera test of normality shows that the error term specified in the equation is not normally distributed. This is the evidence by the respective significance of Jarque-Bera statistics of 13.30445 and P-value of 0.001291.

Cumulative Sum of Recursive Residuals of Square (CUSUMSQ)

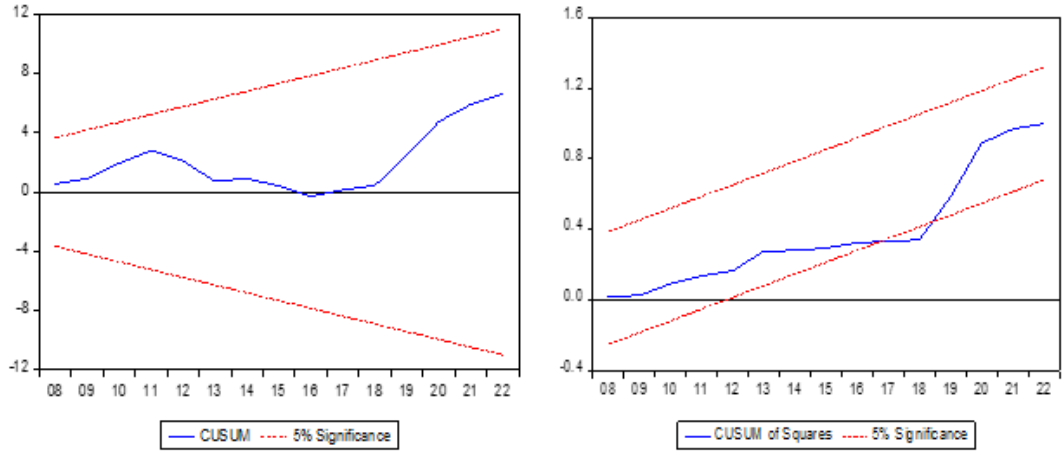

Figure 1: CUSUM and CUSUM Square Tests for OLS Model
Source: Authors Computation, (Eviews-10), 2025

Conclusion and Recommendations

The study used the Dynamic OLS techniques to assessed the impact of transportation on economic growth in Nigeria from 1986 - 2024. The result found the evidence of positive relationship with economic growth in the long run. The result revealed that road transport was found to have a positive influence on economic growth in the long run. Similarly, rail transport revealed to have a positive and direct impact on economic growth in the long run, lastly, post and courier services were found to have a positive influence on economic growth in the long run.

Based on the results of this paper, the paper therefore recommended that:

1. The government, through Federal Ministry of Transportation, Federal Road Maintenance Agency (FERMA), and Federal Road Safety Corps (FRSC) should prioritize improving infrastructure, reducing congestion, and investing in technology and systems that enhance efficiency in these sectors to strengthen its implementation. This would help in stimulating economic growth and improve connectivity, since road transport appears to have a positive and statistically significant impact on economic growth (RGDP) in Nigeria.
2. The government through the Nigerian Railway Corporation (NRC), infrastructure Concession Regulatory Commission (ICRC) and National Environmental Standards and Regulations Enforcement Agency (NESREA) should focus on reforming these subsectors by addressing rail infrastructures and train stations, improving operational efficiency. By doing so, could yield to a significant contribution to the country's GDP in the future, thus fostering long-term economic growth.
3. The government through Nigerian Postal services (NIPOST), Ministry of Communications and Digital Economy and Courier and Logistics Regulatory Department (CLRD) should encourage Nigerians to patronize post and courier

services and also them enhance its operations and services so as to improve customer satisfaction.

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APPENDIX II
Data used for Analysis

Years	Real GDP (N' Billion)	Road Transport (N' Billion)	Rail Transport (N' Billion)	Post and Courier Services (N' Billion)
1986	17,180.55	144.76	6.66	3.10
1987	17,730.34	146.50	4.93	3.14
1988	19,030.69	148.25	3.84	3.19
1989	19,395.96	151.22	2.83	3.23
1990	21,680.20	154.24	2.89	3.30
1991	21,757.90	160.41	2.28	2.68
1992	22,765.55	170.04	1.64	3.39
1993	22,302.24	178.54	1.30	3.49
1994	21,897.47	181.22	0.06	3.51
1995	21,881.56	183.03	0.04	3.58
1996	22,799.69	186.69	0.05	3.72
1997	23,469.34	192.29	0.05	3.93
1998	24,075.15	199.02	0.06	4.20
1999	24,215.78	204.99	0.06	4.52
2000	25,430.42	211.34	0.06	4.85
2001	26,935.32	220.43	0.07	5.24
2002	31,064.27	261.51	0.07	8.55
2003	33,346.62	264.60	0.07	7.85
2004	36,431.37	415.91	0.08	8.70
2005	38,777.01	442.53	0.08	9.65
2006	41,126.68	473.40	0.09	10.70
2007	43,837.39	506.58	0.09	11.86
2008	46,802.76	542.20	0.10	13.16
2009	50,564.26	579.68	0.10	14.51
2010	55,469.35	619.14	0.11	15.98
2011	58,180.35	637.00	0.12	16.45
2012	60,670.05	601.85	0.15	17.83
2013	63,942.85	616.13	0.16	19.60
2014	67,977.46	639.30	0.17	21.39
2015	69,780.69	667.81	0.18	22.62
2016	68,652.43	679.31	0.18	17.79
2017	69,205.69	712.17	0.18	14.92
2018	70,536.35	815.24	0.18	14.93
2019	72,094.09	906.87	0.18	14.91
2020	70,800.54	705.11	0.12	14.93
2021	73,382.77	825.87	0.17	15.37
2022	74,752.42	950.87	0.17	16.04
2023	77,936.10	609.44	0.17	16.36
2024	79,827.85	738.57	0.20	18.77

Source: Central Bank of Nigeria statistical bulletin (2024)