



GREEN FINANCE AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This study on the impact of transportation on the influence of green finance on economic growth in Nigeria. Annual time series data on the values of governments investments in green energy, carbon finance, GDP, and government carbon credit were used for the ARDL model of regression analysis. The study conducted descriptive statistics, unit root test using ADF, Bounds Test for Cointegration, ARDL-ECM analysis. Other post-estimation analysis conducted include serial autocorrelation, and heteroskedasticity tests. It was found that Government Green Investment (Prob = 0.9471), and Green Credit (Prob = 0.5047) have negative and insignificant relationship with gross domestic growth rate (GDPGR) while Carbon Finance (CAF) (Prob=0.3601) has positive but insignificant relationship with GDPGR. The study concludes that green finance has no significant influence on the GDPGR in Nigeria over the period. It is recommended that policies relating to green finance in Nigeria must be reevaluated to ensure that they contribute to the growth of the economy and not vice versa.

Keywords:

Green Energy, Green Finance, Gross Domestic Product, Carbon Finance.

1.1 Introduction

In addressing climate change, there is a growing focus on corporate entities to actively participate in initiatives aimed at mitigating greenhouse gas emissions and other forms of pollution (Ozili, 2022). Significant investments are necessary to implement these activities and initiatives, which aim to mitigate future global emissions and minimize the hazards connected with the climate catastrophe (Wang & Zhi, 2016). The significance of finance, particularly green finance, is substantial as it has the potential to redirect investments towards environmentally friendly industries, provide insurance against climate-related catastrophes, and, most crucially, steer the global economy towards sustainability (Zhang, Zhang, & Managi, 2019).

Green finance refers to the process of obtaining and using finances for initiatives that save the environment while providing a satisfactory return to investors or lenders (Berensmann & Lindenberg, 2019; Ozili, 2021). In this research, the author defined green finance as the process of

obtaining and investing funds for the purpose of promoting eco-friendly environment. Green finance prioritizes environmental concerns and considers environmental preservation and efficient resource utilization as crucial benchmarks for evaluating its operations (Wang et al, 2023). The aim of green finance is to enhance the number of financial resources provided by financial institutions to economic entities engaged in initiatives and endeavors that safeguard the environment, with the ultimate goal of attaining sustainable development objectives (Lee et al, 2023; Fan & Zhang, 2024).

Nigeria introduced the inaugural sovereign green bond in Africa in December 2017, followed by a subsequent green bond series in 2019 (Okediya, 2023). In 2018, the country initiated its Green Bond Market Development Programme. Subsequently, in 2019, the Nigeria Stock Exchange (NSE) marketed green bonds worth about ₦49 billion (Okediya, 2023). Regrettably, there is currently a lack of impartial reports assessing the environmental, social, and economic outcomes of NDC-aligned initiatives that have been sponsored and implemented (Hienrich Boll Stiftung, 2022). The absence of responsibility and openness hinders the nation's endeavors to achieve the goals of sustainable finance in funding for environmentally friendly initiatives. The challenge lies in the capacity restrictions of banks to effectively deploy green finance. Okediya (2023) states that the limited training programmes in the non-bank financial sector hinder the implementation of the 2016 Nigerian Sustainable Finance Principles. This is due to the insufficient capacity of regulators and financial institutions, which poses a challenge to green finance. Hienrich Boll Stiftung (2022) also highlights this issue. Furthermore, Nigerian banks frequently prioritize profitability at the expense of sustainability.

1.2 Statement of the Problem

The difficulties of funding a healthier society while maintaining a stable economy have been of great concern to the world. Countries, financial institutions, and corporations around the world have devised a variety of green financing schemes, including green bonds, green mortgages, green banking, green homes, green insurance, and green credit (Chukwunweike & Ogheneotegiri, 2023). As a result of the inadequacy of available non-renewable energy to meet Nigeria's current industrial energy demand, there is a need to investigate various financing options for renewable energy sources that will have a long-term impact on Nigerian industrial development.

Green finance may promote both economic growth and environmental protection, according to many research. These studies can be classified into two schools of thinking. The first school contends that green financing has a detrimental influence on economic expansion (Wang et al, 2023), whereas the second school contends that green financing promotes growth and suggests reforms to green financing systems (Haiyang, 2017). The second school has received more support in the literature. For example, Wang et al. (2019), Chen et al. (2021), and He et al. (2019) argue that green finance shares characteristics with traditional finance, exemplifies environmental challenges, and can contribute to economic progress. As a result, studies have begun to advocate green financing as a means of achieving the necessary economic growth (Dabylytayeva & Rakhymzhan, 2019; Taghizadeh-Hesary & Yoshino, 2019). Most of these studies point out that the major contributions to green investment have been made by the public sector. Due to inconsistency in empirical literature, this study tends to resolve this issue in the Nigerian context while bringing in the issue of private sector investment in form of green credit (the ratio of carbon emissions to

private sector credit). Consequently, this study seeks to investigate the nexus between green finance and economic growth in Nigeria over the period 1988 to 2024.

1.3 Objectives of the Study

The study aims at evaluating the influence of green finance on economic growth in Nigeria. In light of this, the specific objectives are to;

- i. determine the influence of government green investment on gross domestic product growth rate in Nigeria;
- ii. evaluate the effect of green credit on gross domestic product growth rate in Nigeria;
- iii. investigate the relationship between carbon finance and gross domestic product growth rate in Nigeria;

1.4 Research Hypotheses

In light of the aforementioned objectives and research questions, the following hypotheses are stated in the null form (H_0) as follows;

H₀₁: Government green investment does not significantly influence gross domestic product growth rate in Nigeria.

H₀₂: There is no statistically significant relationship between green credit and gross domestic product growth rate in Nigeria.

H₀₃: Carbon finance does not significantly influence gross domestic product growth rate in Nigeria.

2.0 Literature Review

2.1 Conceptual Framework

2.1.1 Green Finance

Green Finance, a phrase that has emerged in recent years, has been associated with multiple interpretations and definitions within the previous decade. Hanh (2016) defined green finance as an all-encompassing concept that encompasses climate financing but is not restricted to it. It refers to financial investments that are directed towards various initiatives, goods, projects, and policies that promote a sustainable economy. Bloomberg New Energy Finance defines green finance as a broader form of green investment that include land acquisition and project preparation expenditures (Zakari et al, 2023).

Chin et al (2024) provides a comprehensive definition of green finance, which encompasses the financing of both public and private investments in environmental goods and services, as well as the costs associated with their preparation and capital. It also includes financing for public policies that promote the implementation of projects and incentives aimed at adapting to and mitigating environmental damage. Nenavath and Mishra, (2023) suggests that green finance encompasses the various elements of the financial system that handle environmentally-friendly investments, such as

green bonds, green loans, and green structured funds, together with their corresponding legal, economic, and institutional framework requirements.

The crucial significance of green finance in advancing sustainability is accompanied by various drawbacks and obstacles. These include issues such as information asymmetry, ambiguous definitions, inadequate political dedication, and legal/regulatory concerns that have hindered its progress since its inception. In emerging countries, the primary difficulty lies not in obtaining funding, but rather in identifying appropriate projects and organizing the related financial arrangements (Guild, 2020). There are important issues about the future of green finance and the market. The scientific community generally agrees that there is a discrepancy between the level of aspiration and the actual implementation, which could undermine the recent efforts and advances.

2.1.2 Economic Growth

Romer, (1990) observed that the definition of economic growth is open to a fundamental type of criticism. Economists and other social scientists are envious of their right to define concepts as they see fit. For example, lexicographers argue that the meaning given to words must be essentially flexible, changing and developing according to usage and the dictates of the situation under study, which presupposes agreement on a "uniquely, correct" definition of economic growth.

According to Solow (1956), economic growth is a process of quantitative, qualitative, and structural changes that have a positive impact on the economy and the standard of living of the population as it moves toward an inexorably ascendant trajectory. GDP is determined every year, sometimes referred to as Annual GDP. The annual GDP is the total monetary worth of a country's final products and services at market prices for a particular year (Ijirshar, 2019). The Gross Domestic Product, also abbreviated as GDP, is one of the vital tools used by economists to measure or gauge the production level of any economy or the strength of any economy. The Gross Domestic Product describes the current market price worth of all commodities and services produced by a country in a particular period. Several types of research have been undertaken on the link between inflation and the GDP exchange rate.

Several indicators measure a country's macroeconomic development, but the GDP is the most useful indicator. There are several approaches to see the GDP, but the most common are the two types of approaches first is the expenditure-based approach, and the second is the income-based approach.

The GDP growth rate serves as an indicator of the pace at which the economy is increasing. This is achieved by conducting a comparison between the gross domestic product (GDP) of the country for a specific quarter and the GDP of the same quarter in the previous year (Udeaja & Obi, 2015). The main purpose of the GDP growth rate is to assess the rate at which the economy is expanding (Oshodi, 2018). This is achieved by doing a comparison between a country's Gross Domestic Product (GDP) for a specific year and its GDP for the previous year. Put simply, it computes the outcome of the nation's economy.

2.2 Theoretical Review

2.2.1 Relational Financing Theory

The relational financing theory is attributed to Diamond (1991) and Rajan (1992). Diamond (1991) states that relational financing theory centers around establishing trust, cooperation, and long-term relationships, as well as enhancing financing efficiency and economic performance. In accordance with the theory, establishing trust and cooperation between borrowers and lenders is crucial for minimizing information asymmetry and uncertainty, and enhancing the efficiency of resource allocation through a stable relationship. Lenders possess a profound comprehension of the requirements of borrowers, offer tailored financial solutions, and collaborate in order to attain long-term objectives and expansion. The relational financing theory provides guidance to financial institutions in enhancing the efficiency and profitability of their financing activities, while also fostering collaboration with the real economy. The lender's choice is myopic due to the borrowers' projects maturing after a single time. Hence, a lender would always avoid participating in zombie lending (Diamond, 1991).

Applying relational financing theory to green financial services can significantly enhance the efficiency of the actual economy. The theory underscores the significance of fostering trust, collaboration, and enduring connections (Diamond, 1991). Within the realm of green finance, financial institutions establish reliable connections with borrowers involved in green projects, enabling them to acquire a deeper understanding of their environmental plans, sustainable development objectives, and business methodologies (Li & Huang, 2023). This trust and partnership contribute to the reduction of information asymmetries and uncertainties, enhance financial institutions' comprehension and trust in green initiatives, and consequently enhance financing efficiency. Simultaneously, financial institutions possess a profound comprehension of borrowers' requirements and offer them tailored financing solutions, hence enhancing the efficiency of finance in the actual economy (Li & Huang, 2023).

2.2.2 The Neo-classical Growth Models

The neoclassical growth mode is developed by Robert M. Solow, an American economist and Trevor Swan in 1956 which is as an extension of the Harrod-Domar Model (Solow, 1956). It is a "growth accounting" production function model that states that three factors drive economic growth: technology, capital accumulation, and labor force. Although increasing capital accumulation and labor force participation may boost economic growth in the short run, the Solow growth model does not see capital injection as a long-run source of growth due to diminishing returns: the returns to each additional machine will become lower and lower as one adds more and more machines relative to workers. This also implies that saving (deferred consumption, which serves as compensation for investment) does not contribute to long-run growth.

Solow's "solution" to this conundrum was to introduce the concept of "technology change." That is, once the steady-state is reached and a country's resources are depleted, the rate of economic growth can only be increased through innovation and technological advancements. Technology can be thought of as a blueprint that organizes workers and machines in more efficient ways. As a result, technological advancement would imply an improvement in such blueprints. Regardless, the

same conclusion emerges: more capital or machinery per worker cannot be a source of long-run growth, but only aids in the transition to the long-run path.

After proposing that technological progress dictates economic growth, a major criticism of the Solow model is that it does not address the causative factors of technological progress, instead treating it as an exogenous factor in the growth process. That is, in the model, technological progress is determined by non-economic factors such as advances in basic sciences. As a result, it ignores the issues of inducing technical progress through the processes of learning, research investment, and capital accumulation. This was the challenge taken on by a number of researchers in the 1990s, particularly Paul Romer in 1990, who set out to discover what kinds of economic factors actually govern technological progress.

2.3 Empirical Review

Qian and Yu (2024) analyzed the impact of the green financing policy on the environmental, social, and corporate governance performance in China from 2011 to 2020. The study utilized channel analysis. The study reveals that implementing the legislation enhances the environmental, social, and corporate governance performance of significantly polluting firms. Channel study indicates that the implementation of the green finance strategy exacerbates the financial limitations faced by these firms. Moreover, the favourable impact of green finance policy on the performance of environmental, social, and corporate governance is more noticeable for companies that have superior internal and external governance.

In their study conducted, Fan and Xiong (2024) analyzed data from 2011 to 2020 using a double-difference method. They specifically investigated the impact of green finance on economic growth, focusing on two effects: its contribution to growth and its potential to displace other forms of financing. The empirical findings indicate that green finance generally enhances economic growth and does not hinder the establishment of new businesses, while also displacing the economic contribution of heavily polluting industries. Green financial policies primarily impact economic performance by influencing the allocation of resources and driving technological innovation. Specifically, when compared to the central and western regions, green finance has a greater impact in the eastern region. This can be attributed to differences in regional development levels, efficiency of the financial system, and the extent of marketization. Furthermore, resource-dependent cities experience a more pronounced impact from both growth and crowding-out effect.

Gao et al. (2023) conducted a research study using 30 sets of province panel data from China spanning from 2010 to 2019. They utilized a novel spatial econometric model to combine green finance, environmental pollution, and high-quality economic development into a single empirical analysis framework. China's spatial auto-regressive and spatial error model tests indicate that regional green finance and high-quality economic development have spatial spillover effects. The eastern region takes the lead, while the central region progresses in parallel and the western region follows behind. This is due to a strong moderating effect in the eastern region. Green finance significantly enhances high-quality economic development, while the escalation of environmental pollution hinders such development. Green financing can aid in reducing the harmful impacts of pollution on sustainable economic growth. Based on the analysis of how it works, green finance reduces pollution by changing the way industries are structured and promoting advancements in science and technology. The green finance threshold test shows a non-linear effect on the

development of economic quality once a specific threshold value is reached, and it exhibits a distinct threshold characteristic. The research has policy implications as it enhances comprehension of the dynamics of high-quality economic development, as well as the advantages, mechanisms, and diversity of green finance in mitigating pollution and promoting high-quality economic development.

Nenavath and Mishra (2023) conducted an analytical study on the impact of green finance and financial technology on sustainable economic growth. The analysis relies on data collected from Indian states spanning the years 2010 to 2021. The research paper employed the panel regression technique to investigate the relationship between fintech, green finance, and economic growth. It utilized a two-step GMM (generalized method of moments) to address the endogeneity concerns of the variables. The study found that green finance has a broad impact on the structure of finance, financial effectiveness, and the development of environmental quality protection, leading to substantial improvements in economic growth. In addition, fintech amplifies the notable impact of green finance on the financial framework and the preservation of environmental quality, without affecting the relationship between green finance and economic efficiency. The current research paper provides policy recommendations for policymakers and the Government of India based on the findings. These recommendations include enhancing the integration of fintech growth with green finance, establishing a comprehensive environmental disclosure framework to guide state governments in improving the effectiveness of green finance, and promoting sustainable protocols as an external intervention to stimulate green finance in the private sector.

Xu et al. (2023) utilized the Panel Vector Autoregressive (PVAR) method to investigate the connections among green bonds, resource efficiency index, and green economic growth rates in the industrial and agricultural sectors across 29 countries with green financing markets. The analysis focused on the period from 2015 to 2021. The primary findings validated that the issuance of green bonds and the promotion of green economic growth within the industry have the potential to expedite the rate of green economic growth in agriculture. Simultaneously, the agriculture sector has not experienced a substantial increase in the rate of green economic growth as a result of resource efficiency. Furthermore, the feedback hypothesis pertains to the correlation between the issuance of green bonds and the promotion of green economic growth in the fields of industry and agriculture. The primary suggested policy implications include enhancing and restructuring the financial sector, redefining resource efficiency indicators within countries, and establishing a digital green financing market.

Wu (2023) investigated the effects of investing in renewable energy, specifically in geothermal, solar, bioenergy, hydropower, and wind power projects, as well as green finance, on the economic performance of the Organization for Economic Co-operation and Development (OECD) economies. The authors have utilized secondary data from 2001 to 2019 sourced from the international renewable energy agency (IRENA), global green finance index (GGFI), and world development indicators (WDI). The present article has utilized the generalized method of moments (GMM) and fixed-effect model (FEM) to investigate the relationship among the mentioned variables. The findings suggest that investing in renewable energy resources and utilizing green finance have a substantial and favourable impact on the economic performance of the chosen economies. The study offers assistance to future researchers in their exploration of this field and

provides guidance to policy makers in formulating policies for economic performance and investment in renewable energy resources.

Chukwunweike and Ogheneotegiri (2023) examined the impact of green finance initiatives (GFI) on economic stability in Nigeria throughout the period of 1989 to 2021. The GFI proxy, developed by Green Prevention Costs-GNPC, Green Evaluation Costs-GNEC, and Green Internal Failure Costs-GNIC, is used as the regressor to quantify the impact of economic stability, represented by Real Gross Domestic Product-RGDP. Trade Openness (TROP) is used as the control variable. The study utilized secondary data sourced from the World Bank Pollution Management database, the Central Bank of Nigeria-CBN Statistical Bulletin (2021), and the Econometric Views (E-Views) 9.0 software was employed for the Robust Least Square (RLS) analysis. The results of the RLS tests indicate that both Green Prevention Costs-GNPC and Green Internal Failure Costs-GNIC have a direct and statistically significant impact on the economic stability of Nigeria. Nevertheless, the impact of Green Evaluation Costs, as assessed by the quantities of GNEC, on the economic stability of Nigeria was shown to be statistically small, despite being direct. Therefore, the study concludes that the Green Prevention Costs and Green Internal Failure Costs (GFI) have a significant impact on the stability of the Nigerian economy. The report advised that regulatory agencies should promptly allocate additional funding towards Green Prevention Costs. Furthermore, it is necessary for the regulatory authorities to reassess the level of attention given to Green Evaluation Costs.

Xu and Dong (2023) analyze the influence of green finance on the advancement of high-quality economic growth and its transmission pathway by employing the intermediary model. The study focuses on 30 provinces and cities in China during the period of 2009-2019. A model is developed to investigate the impact of green finance on achieving economic growth through the intermediation of industrial structure advancement and rationalization, as well as the moderating effect of environmental regulation. Ultimately, an examination of regional heterogeneity is performed. The study revealed that green finance plays a substantial role in promoting high-quality economic development. Additionally, it was shown that both advanced and rationalized industrial structure had a beneficial mediation influence. Furthermore, environmental regulation effectively enhances the beneficial influence of green finance development on the improvement of industrial structure. It also reinforces the role of industrial structure improvement in fostering high-quality economic development, while exerting a substantial positive regulatory effect on the direct impact of green finance on economic quality advancement. Regional disparities exist in the influence of green financing on the advancement of high-quality economic growth.

Cao (2023) investigates the impact of green finance on the green economic performance index in seven emerging nations between 2005 and 2018. The study utilized advanced panel cointegration approaches of the second generation. The cross-sectional dependency and slope heterogeneity test results demonstrate that there is correlation among the panels and that there is variation in the slopes. The findings for both the short-term and long-term periods validate the correlation between the green economic performance index, green financing, GDPC, technical innovation, CSR, and green energy. Both in the short-term and long-term, the implementation of green finance, technical innovation, and corporate social responsibility (CSR) contribute to a reduction in carbon emissions and promote the establishment of environmentally sustainable economies. Conversely, higher

income per capita and gross domestic product per capita (GDPC) are strongly associated with increased carbon emissions. The results obtained from the D-H panel causality test confirm the robustness of the findings. Policymakers should implement green financing reforms to incentivize the use of efficient technologies and promote the reduction of energy demand.

3.0 Methodology

3.1 Research Design

The study adopts an ex post facto research design, focusing on the analysis of past events. This method is particularly suitable for investigating cause-and-effect relationships between independent and dependent variables (Onwumere et al., 2013). The primary objective is to identify causal links among the selected variables. Accordingly, the data utilized, obtained from the National Bureau of Statistics and the Central Bank of Nigeria (CBN) statistical bulletins, are secondary and span a 38-year period from 1986 to 2024. Annual time series data were analyzed using the ARDL model of regression analysis.

3.2 Model Specification

The aim of the researcher was to determine the output effect of inflationary pressure on the standard of living in Nigeria over a period of twenty-two years. To achieve this, the researcher estimated the HDI using a linear regression equation:

$$\text{GDPGR} = a_0 + a_1\text{GGI} + b_2\text{CAF} + b_3\text{GCD} + e_1 \text{-----} (1)$$

Where:

GDPGR is the gross domestic product growth rate.

GGI is the government green investment

GCD is the green credit

CAF is the carbon finance

E_1 is the error term

a_1 - a_3 = the coefficients of green finance.

a_0 = intercept parameter estimates

3.3 Data Analysis Techniques

The research employs the use of time series data for a period of 37 years ranging from 1988-2024. In analyzing the relationship between green finance and GDP, ARDL regression analysis was conducted using key variables such as GDP, GGI, CAF, and GCD. The study variables were analyzed using the E-Views software. Pre-estimation and post-estimation tests were also conducted.

4.0 Data Presentation and Result Analysis

Table 4.1 Descriptive Statistics

	LOG_CAF_	LOG_GCD_	LOG_GDPGR_	LOG_GGI_
Mean	0.582381	2.985205	-3.378152	4.640476
Median	0.144966	2.923968	-2.937463	3.879851
Maximum	4.576421	7.285054	-1.924149	8.444388
Minimum	-1.487220	0.215918	-6.214608	2.850938
Std. Dev.	1.831899	2.235045	1.045033	1.615785
Skewness	0.799784	0.427674	-0.989123	1.127472
Kurtosis	2.450213	1.952706	3.406926	2.939812
Jarque-Bera	4.410534	2.818852	5.948614	7.844614
Probability	0.110221	0.244283	0.051083	0.019795
Sum	21.54809	110.4526	-118.2353	171.6976
Sum Sq. Dev.	120.8108	179.8354	37.13121	93.98744
Observations	37	37	37	37

Source: Author's computation using Eviews (2025)

From the above, the descriptive statistics indicate that the variables used are not generally normally distributed. However, Log CAF and Log GCD are normally distributed as reflected by the probabilities associated with their Jarque-Bera statistics. Additionally, the data shows that the std of deviations for all the variables are not distant from the mean, suggesting a very small variability in the dataset.

Table 4.2 Unit Root Analysis

Variables	At levels (Prob)	At First Difference (Pro)	Comments
GDPGR	0.0173	0.0000	I(0) Stationary at levels
GCD	0.3825	0.0000	I(1) Stationary at first diff
CAF	0.1427	0.0000	I(1) Stationary at first diff
GGI	0.1237	0.0000	I(1) Stationary at first diff

Source: Author's computation (2025)

The unit root tests show that the variables are stationary at both levels and at first difference, suggesting the use of ARDL regression analysis as the most appropriate analytical method for the study due to the mixed integration.

4.1 Bounds test for Cointegration

The bounds test for cointegration tests for long term relationship between the dependent and the independent variables used in the study (Rehman et al, 2020).

Table 4.3: Bounds test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	6.115153	10%	3.47	4.45
K	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

Source: Authors computation from Eviews (2025)

The bounds cointegration test reveals that the f-stat is greater than the 5% asymptotic value. This suggests that there is a long-term relationship between the variables.

Table 4.4 ARDL ECM

ECM Regression

Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.433877	1.065480	-1.345757	0.1984
@TREND	-0.008827	0.023047	-0.383014	0.7071
D(LOG_GDPGR_(-1))	-0.252014	0.153816	-1.638416	0.1221
D(LOG_GDPGR_(-2))	-0.088701	0.158934	-0.558101	0.5850
D(LOG_CAF_)	0.818732	0.867187	0.944124	0.3601
D(LOG_GCD_)	-0.599715	0.877298	-0.683593	0.5047
D(LOG_GGI_)	-0.028355	0.420073	-0.067499	0.9471
CointEq(-1)*	-0.390897	0.140390	-2.784373	0.0139
R-squared	0.686154	Mean dependent var		0.228682
Adjusted R-squared	0.564103	S.D. dependent var		1.008750
S.E. of regression	0.666002	Akaike info criterion		2.272611
Sum squared resid	7.984052	Schwarz criterion		2.659718
Log likelihood	-21.54395	Hannan-Quinn criter.		2.384084
F-statistic	5.621858	Durbin-Watson stat		1.938987
Prob(F-statistic)	0.001466			

Source: Author's computation using Eviews (2025)

The ARDL ECM results of the model shows the relationships between the dependent and the independent variables over the period. The result reveals that the R-square, which shows the goodness-of-fit, is 68.6%. This shows that 68.6% of the changes in the dependent variables are caused by the changes in the independent variables. The f-test also shows that the model, taken as a whole, is statistically significant. This implies that the model is reliable for the current analysis. The model equally shows that the error correction mechanism (ECM) is -39.1%. This implies that there is 39.1% annual speed of adjustment of the variables to equilibrium.

Table 4.5 Serial Correlation Tests

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.265880	Prob. F(2,13)	0.7706
Obs*R-squared	1.021726	Prob. Chi-Square(2)	0.6000

Source: Author's computation using Eviews (2025)

The serial correlation helps to understand how (and if) a variable affects itself when lagged. The implication is that if a variable affects its self over time, this will result to spurious results and cannot be used for predictive purposes (Schork, 2022). The serial correlation results for the model reveals that there is no issue of serial correlation among the variables used. This is shown by the probability of the F-stat being more than 0.05.

Table 4.6 Heteroskedasticity Tests

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.905121	Prob. F(10,15)	0.5516
Obs*R-squared	9.784602	Prob. Chi-Square(10)	0.4596
Scaled explained SS	9.174655	Prob. Chi-Square(10)	0.5156

Source: Author's computation using Eviews (2025)

The heteroskedasticity test reveals the variability of the variance or error term of the time series over the period. As one of the assumptions of regression analysis, heteroskedasticity shows that the error terms of the variables are not the same (and cannot be) if the analysis will be reliable (Daryanto, 2020). As the results shows, the probabilities of the f-stat are greater than 0.05. This shows that there is no reason to believe that the variables are homoskedastic.

4.2 Tests of Hypotheses

The results of the ARDL ECM are used for the tests of hypotheses.

H₀₁: *Government green investment does not significantly influence gross domestic product growth rate in Nigeria.*

The analysis shows that there is a negative relationship between GDPGR and GGI. The result shows that as GGI increases by a unit, GDPGR decreases by -0.028355 and vice versa. The analysis reveals that GGI is not statistically significant as shown by the t-value prob (0.9471). We will

therefore reject the alternative hypothesis, accept the null and conclude that there is no significant relationship between GDPGR and GGI over the period.

H₀₂: *There is no statistically significant relationship between green credit and gross domestic product growth rate in Nigeria.*

Further, the analysis shows that there is a negative relationship between GCD and GDPGR. The result reveals that as GCD increases by a unit, GDPGR decreases by -0.599715 and vice versa. The analysis reveals that GCD is statistically insignificant as shown by the t-value prob (0.5047). We will therefore accept the null hypothesis, reject the alternative and conclude that there is no significant relationship between GDPGR and GCD over the period.

H₀₃: *Carbon finance does not significantly influence gross domestic product growth rate in Nigeria.*

The analysis shows that there is a positive relationship between CAF and GDPGR over the period. The result shows that as CAF increases by a unit, GDPGR increases by 0.818732 and vice versa. The analysis reveals that CAF is not statistically significant as shown by the t-value prob (0.3601). We will therefore accept the null hypothesis, reject the alternative and conclude that there is no significant relationship between GDPGR and CAF over the period.

4.3 Discussion of findings

The results of the analysis reveal that GDP green finance ratio has been fairly constant over the years, suggesting the level of importance that has been attached to it by the government. Various authors have researched on the influence of green finance on economic growth in Nigeria and their research findings have shown the importance of sound policies to efficiently manage the impact of green finance to improve the GDP. The research reveals that GGI and GCD have a negative and insignificant relationship with GDPGR while CAF has a positive but insignificant relationship with GDPGR. This implies that as these variables will decrease the GDPGR as they increase and vice versa. This equally indicates that GDPGR is inversely proportional to the changes in the country's green finance policies. The findings also imply that the economy will be negatively affected if green finance policies continue the way it is. This disagrees with the findings of Qian & Yu (2024) who analyzed the impact of the green financing policy on the environmental, social, and corporate governance performance in China from 2011 to 2020 and found that there is a favourable impact of green finance on the performance of the environmental, social and corporate governance.

Again, the study found a negative and insignificant relationship between GCD and GDPGR. The study shows that green credit depreciates the GDPGR when it increases and vice versa. The implication is that a reduction in the GCD will push up the GDPGR and vice versa. The findings disagree with the findings of Fan & Xiong (2024) who found that green finance generally enhances economic growth and does not hinder the establishment of new businesses or affect existing businesses.

Equally, the study reveals that GGI negatively affects GDPGR over the period. With a percentage increase in the GGI rate, GDPGR decreases by a percentage and vice versa, implying that the more the government sets aside green credit, the less the economy benefits from it and vice versa. Studies by Xu and Dong (2023) and Gao et al. (2023) disagree with the findings of this study on the impact of government green finance and economic growth over the period.

5.0 Conclusion and Recommendations

The study concludes that green finance has no significant influence on the GDPGR in Nigeria over the period. As stated earlier, the green finance refers to funds provided by the government to save the environment. The ARDL model reveals that the carbon credit, government green investment, and green credit cannot significantly affect the GDPGR.

The study concludes that green finance does not have a deep or devastating effect on the GDP of Nigeria. There is no evidence to suggest that green finance has contributed significantly to the growth of the Nigeria's economy and vice versa.

Again, this study also underscores the nuances of green energy, suggesting that although it is important, it may not be expedient. This is because it does not significantly improve the GDP. The findings of this study agree with the school of thought of Wei & Jinhua (2014) who stated that green financing may be detrimental to economic expansion. The findings have also revealed that green financing does not improve the economic growth over the period of study.

Based on the findings of the study, it is important that policy makers adopt practical and goal-oriented approach in ensuring green finance does not negatively impact on the economy. Good policy must prioritize the welfare of the economy, ensuring that the goal of green finance must have positive impact both in the short-run and long run. This study therefore recommends that policymakers and environmentalist should ensure that policies and programs targeted at improving the environment through green finance must be developed to have a positive and significant impact on the economy.

Again, the study reveals that carbon finance does not significantly influences the GDPGR. Therefore, less focus should be placed on it, while the funds are efficiently channeled to other key areas of the economy.

Finally, the research recommends that policies relating to green finance in Nigeria must be reevaluated to ensure that they contribute to the growth of the economy and not vice versa.

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