The Effect of Inflation on Gross Domestic Product per Capita (GDPPC) in Nigeria

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DOI: https://doi.org/10.47772/IJRISS.2026.101100347

Received: 04 November 2026; Accepted: 11 November 2026; Published: 26 November 2026

ABSTRACT

This study investigates the effect of inflation on Gross Domestic Product per Capita (GDPPC) in Nigeria over the period 1991 to 2024. An ex post facto research design was adopted, and annual secondary time-series data were obtained from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS). GDPPC is the dependent variable; inflation is the main independent variable, while unemployment, exchange rate, foreign direct investment (FDI), and government expenditure serve as control variables. The study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach, justified by the mixed I(0)/I(1) integration orders of the variables and the small sample size. Lag length is selected by the Akaike information criterion. The findings reveal that inflation has a statistically significant short-run effect on GDPPC but no statistically significant long-run relationship. The exchange rate, by contrast, exerts a significant and robust long-run effect, underscoring the dominance of external-sector conditions in determining per capita income in Nigeria. The error-correction term is negative and statistically significant, confirming a long-run relationship. Diagnostic tests confirm the absence of serial correlation and heteroskedasticity, and the CUSUM test confirms parameter stability. The study recommends that the CBN strengthen monetary policy to sustain a stable and predictable inflation environment; that fiscal authorities channel expenditure toward infrastructure, healthcare, education, and productive sectors; and that exchange-rate stability be prioritised to create a favourable investment climate.

Keywords: Inflation, Gross Domestic Product per Capita (GDPPC), Exchange Rate, ARDL, Nigeria.

INTRODUCTION

1.1 Background to the Study

Nigeria is endowed with abundant natural and human resources, yet persistent macroeconomic challenges continue to affect its economic performance. Inflation, defined as a sustained increase in the general price level of goods and services, remains a major concern in Nigeria. It has been influenced by exchange-rate volatility, rising production costs, supply constraints, monetary factors, and fluctuations in crude oil prices (Obute et al., 2020; Musa et al., 2024). Persistent inflation reduces purchasing power, increases production costs, discourages savings and investment, and creates uncertainty for businesses and households. Although moderate inflation may accompany economic expansion, excessive inflation can weaken economic activity and undermine economic stability (Ali & Asfaw, 2023). These effects can constrain economic growth and consequently affect the level of GDP per capita.

Gross Domestic Product per capita (GDPPC) represents the average economic output generated per person and is commonly used as an indicator of economic well-being and living standards. Rising inflation can reduce the real value of GDPPC by eroding income and purchasing power. High inflation may also discourage investment and limit productive activities, thereby constraining improvements in GDPPC (Musa et al., 2024). The relationship is particularly important in Nigeria, where economic growth has occurred alongside significant inflationary pressures. Maintaining price stability is therefore essential for ensuring that economic growth

translates into improvements in real GDPPC and living standards. Against this background, this study examines the effect of inflation on GDPPC in Nigeria.

1.2 Statement of the Problem

Nigeria is richly endowed with natural and human resources, yet persistent inflation remains a major challenge to its economic performance. Inflation has been driven by exchange-rate volatility, rising production costs, supply constraints, and fluctuations in crude oil prices (Obute et al., 2020; Musa et al., 2024). Persistent inflation increases production costs, discourages savings and investment, and creates uncertainty in economic activities. GDP per capita measures average economic output per person and serves as an important indicator of economic well-being and living standards. High inflation can reduce the real value of GDPPC by eroding income and purchasing power. It may also constrain investment, productivity, and economic growth, thereby limiting improvements in GDPPC (Musa et al., 2024). While moderate inflation may accompany economic expansion, excessive inflation can undermine economic stability and growth (Ali & Asfaw, 2023).

The theoretical literature offers competing predictions. The Quantity Theory of Money (Fisher, 1911; Friedman, 1968) predicts long-run neutrality, while the Keynesian framework (Keynes, 1936) allows short-run real effects through wage and price rigidities. The threshold literature (Obute et al., 2020; Aktar et al., 2022; Bangura & Omojolaibi, 2024) suggests that inflation may be growth-enhancing below a threshold but harmful above it. Which prediction holds for Nigeria is an empirical question that existing Nigerian studies have not resolved, because most examine aggregate GDP growth rather than per capita income (Williams & Sola, 2018; Yacoubian et al., 2025; Ikwor et al., 2024; Nwanosike, 2025). Against this background, this study examines the effect of inflation on GDPPC in Nigeria to provide evidence for policies that promote sustainable economic growth and improved economic welfare.

1.3 Objectives of the Study

The primary objective of this study is to examine the effect of inflation on Gross Domestic Product per Capita (GDPPC) in Nigeria over the period 1991 to 2024.

The specific objectives are to:

1. Examine the long-run effect of inflation on GDPPC in Nigeria.
2. Assess the short-run effect of inflation on GDPPC in Nigeria.
3. Evaluate the effects of unemployment, exchange rate, FDI, and government expenditure on GDPPC as control variables.

1.4 Research Hypotheses

$H0_1$: Inflation has no statistically significant long-run effect on Gross Domestic Product per Capita (GDPPC) in Nigeria.

$H0_2$: Inflation has no statistically significant short-run effect on Gross Domestic Product per Capita (GDPPC) in Nigeria.

1.5 Scope of the Study

This study investigates the effect of inflation on Gross Domestic Product per Capita (GDPPC) in Nigeria over the period 1991 to 2024, covering thirty-four (34) years. GDPPC is the dependent variable. The inflation rate serves as the main independent variable, while unemployment, exchange rate, foreign direct investment (FDI), and government expenditure are incorporated as control variables.

The choice of the 1991–2024 period is informed by three considerations. First, it captures the post-Structural Adjustment Programme era, during which Nigeria's monetary and fiscal policy regimes were substantially redefined. Second, the period encompasses multiple inflationary episodes, exchange-rate regime changes, and

structural reforms, providing sufficient variation for econometric identification. Third, extending the data to 2024 ensures the study's relevance to current macroeconomic realities.

1.6 Significance of the Study

This study is significant to policymakers and regulatory institutions by providing insights into the effect of inflation on GDP per capita (GDPPC). Financial institutions, investors, and private-sector operators may use the findings to improve planning, forecasting, and investment decisions. The study will also serve as a useful reference for researchers, students, and scholars in economics, finance, and related fields. By providing updated empirical evidence, it may encourage further research and scholarly discussion on inflation and economic performance. Ultimately, the study contributes to informed policymaking, sustainable economic development, and improved living standards in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Concept of Inflation

Inflation is a sustained increase in the general price level of goods and services over time, eroding the purchasing power of money (Okoro & Kenneth, 2024). In Nigeria, inflation is primarily driven by exchange-rate volatility, rising production costs, supply constraints, monetary expansion, and crude oil price fluctuations (Obute et al., 2020; Musa et al., 2024; NBS, 2022). The literature categorizes inflation into demand-pull (excess aggregate demand over supply), cost-push (reduced supply from rising production costs), and structural inflation (monetary and institutional rigidities) (Adaramola & Dada, 2020). It is further classified by severity as moderate, high, chronic, or hyperinflation (Obute et al., 2020). In Nigeria, persistent inflation discourages savings, impedes productivity, and disproportionately affects low-income households who spend a larger share of their income on essentials.

2.1.2 Concept of GDP per Capita

Gross Domestic Product per capita (GDPPC) is a nation’s total economic output divided by its population, serving as a standard gauge of average living standards and economic prosperity (Kitov, 2021; Obute et al., 2020). While GDPPC does not capture income inequality, it reflects average individual economic welfare. In Nigeria, where millions live below the poverty line (NBS, 2022), high inflation erodes the real value of per capita output, discourages investment, and constrains job creation, thereby limiting improvements in living standards (Abazari, 2019).

2.1.3 Concept of Unemployment

Unemployment occurs when individuals who are willing, able, and actively seeking work cannot secure jobs (Bello & Fagbemi, 2023; Ambrose, 2021). In Nigeria, unemployment remains a persistent macroeconomic challenge that fuels poverty—particularly among youth—by cutting off household income and lowering living standards (Adelowokan et al., 2019; Aderemi et al., 2021).

2.1.4 Exchange Rate

The exchange rate is the price at which one currency exchanges for another; in Nigeria, it represents the amount of naira required to purchase one unit of foreign currency (Emmanue, 2019). Exchange rate volatility directly affects output, trade competitiveness, interest rates, and domestic price levels by altering the cost of imported and locally produced goods (Maku et al., 2023; Adeneye et al., 2024).

2.1.5 Foreign Direct Investment and Government Expenditure

Foreign Direct Investment (FDI) involves a foreign entity acquiring an ownership stake in a domestic enterprise or project. FDI acts as a catalyst for capital accumulation, technology transfer, human capital

development, and job creation (Alfaro, 2017; Aderemi et al., 2020; Madueke et al., 2022). Conversely, government expenditure comprises public spending on recurrent operations, capital projects, and transfers (Chiadika, 2024). While productive spending stimulates growth, excessive recurrent or non-productive expenditure fuels inflation and crowds out private investment (Olalekan et al., 2024).

2.2 Theoretical Review

2.2.1 The Quantity Theory of Money

Formalized by Irving Fisher (1911) and extended by monetarists like Milton Friedman (1968), the Quantity Theory of Money (QTM) posits that inflation is fundamentally a monetary phenomenon driven by money supply growth outpacing real output (Humphrey, 1984). Expressed as $MV = PY$ (where M is money supply, V is velocity, P is the price level, and Y is real output), the theory assumes stable velocity and output in the long run, meaning monetary expansion raises prices proportionally without altering real output (Friedman & Schwartz, 1963). Applied to GDPPC, QTM predicts long-run neutrality of inflation, generating this study's first hypothesis: inflation has no significant long-run effect on GDPPC. However, critics note that velocity is rarely stable in developing economies like Nigeria, and the model overlooks structural supply shocks and imported inflation (Keynes, 1936; Tobin, 1970).

2.2.2 Keynesian Theory of Demand-Pull Inflation

Keynesian theory attributes inflation to excessive aggregate demand (consumption, investment, government spending, and net exports) exceeding an economy's productive capacity, particularly near full employment (Keynes, 1936; Blanchard, 2017; Mankiw, 2021). Qualifying the QTM, Keynesians argue that because wages and prices are sticky in the short run, rising demand can temporarily stimulate real output and employment before prices fully adjust. This yields the study's second hypothesis: inflation has a significant short-run effect on GDPPC. This perspective aligns closely with Nigeria's fiscal deficits and expansionary government consumption (Arestis & Sawyer, 2005).

2.2.3 The Structuralist and Threshold Views

Originating from the Latin American Structuralist School (Prebisch, 1950; Sunkel, 1960), structuralist theory argues that inflation in developing economies stems from supply rigidities, sectoral imbalances, and institutional bottlenecks rather than monetary excess alone (Taylor, 1983; Olatunji, 2018). Complementing this, threshold literature posits a non-linear inflation–output relationship: below an optimal threshold (7–13% in developing nations), inflation is benign or growth-enhancing, whereas beyond it, uncertainty and price distortions suppress growth (Fischer, 1993; Benati, 2021). Empirical thresholds for Nigeria range from 8% (Obute et al., 2020) to 12.88% (Bangura & Omojolaibi, 2024) and 13% (Aktar et al, 2022). Given Nigeria's 18% sample average inflation, testing for asymmetry is well-motivated.

2.2.4 Theoretical Framework

This study synthesizes the Quantity Theory of Money, Keynesian demand-pull theory, and the threshold perspective. QTM anchors the long-run neutrality hypothesis, Keynesian theory anchors short-run non-neutrality, and threshold theory informs non-linearity robustness checks. Within an Autoregressive Distributed Lag (ARDL) framework, a significant short-run coefficient paired with an insignificant long-run coefficient validates the Keynesian–QTM synthesis, whereas a significant long-run effect supports structuralist or threshold dynamics.

2.3 Empirical Review

Empirical evidence on the inflation–per capita income nexus remains mixed across contexts. Studying BRICS economies (1999–2011), Khalid et al. (2015) found that inflation significantly affected per capita income in China and Russia, but had no significant impact in India, Brazil, or South Africa, highlighting the role of country-specific structural conditions.

Within Nigeria, most studies examine aggregate GDP rather than GDPPC, largely reporting negative long-run effects. Using VECM and cointegration techniques, Williams and Sola (2018), Yacoubian et al. (2025), Adaramola and Dada (2020), Ikwor et al. (2024), Nwanosike (2025), and Okoro and Kenneth (2024) consistently demonstrated that inflation—often alongside interest and exchange rate pressures—significantly hampers Nigeria's economic growth. However, Raju et al. (2018) observed both positive and negative long-run dynamics between 1992 and 2017.

Threshold studies confirm non-linear dynamics: Kitov (2021) identified a 10% threshold across 165 countries, and Bandura (2022) found a 31% threshold for Sub-Saharan Africa. For Nigeria specifically, Obute et al. (2020), Bangura and Omojolaibi (2024), and Aktar et al (2022) established thresholds of 8%, 12.88%, and 13%, respectively, above which inflation turns growth-retarding. Regarding control variables, Ehikioya (2019), and Adaramola and Dada (2020) documented that exchange rate volatility depresses Nigerian growth, while Adeneye et al. (2024) showed that inflation erodes household consumption. Conversely, Babasanya (2018), Aderemi et al. (2020), and Madueke et al. (2022) confirmed that FDI positively drives employment, productivity, and poverty reduction.

2.4 Summary and Gaps in Literature

The literature establishes three stylized facts: theoretical predictions on inflation and output diverge across time horizons; Nigerian empirical research overwhelmingly focuses on aggregate GDP rather than GDPPC; and cross-country per capita studies show context-dependent outcomes.

Consequently, this study addresses several critical gaps in the Nigerian literature:

i. Focus on Per Capita Welfare: Unlike prior studies centered on aggregate GDP, this study evaluates GDPPC as a more direct proxy for average living standards and household welfare.
ii. Horizon Disaggregation: It explicitly separates short-run dynamics from long-run equilibrium effects using a parsimonious ARDL-ECM specification suited to the sample size, avoiding over-parameterization.
iii. Extended Temporal Scope & Asymmetry: Covering a 34-year span (1991–2024), the study accounts for structural economic shocks, non-linear inflation thresholds, and macroeconomic policy effectiveness—areas frequently overlooked in shorter-horizon Nigerian studies.

3. RESEARCH METHOD

3.1 Research Design

An ex post facto research design was adopted. Ex post facto is a type of research method in which the researcher cannot directly manipulate the independent variables included in the model because the behaviours of the variables have already been determined.

3.2 Type and Sources of Data

This study employed annual secondary time-series data ranging from 1991 to 2024, which is 34 years.

3.3 Method of Data Collection

The data used in this study were drawn from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS).

3.4 Variables in the Model

The dependent variable is Gross Domestic Product per Capita (GDPPC). The main independent variable is the inflation rate (INF), while unemployment (UNE), exchange rate (EXCHR), foreign direct investment (FDI), and government expenditure (GVT) serve as control variables. Table 3.1 summarises variable definitions, measurement, sources, and expected signs.

Table 3.1: Variable Definition, Measurement, Source, and Expected Sign

Variable	Symbol	Measurement	Source	Expected Sign
GDP per capita	GDPPC	GDP divided by population (₦)	CBN / NBS	Dependent
Inflation	INF	Annual % change in headline CPI	NBS	− (long run)
Unemployment	UNE	Unemployment rate (%)	NBS	−
Exchange rate	EXCHR	Official annual average ₦/US$ rate	CBN	−
Foreign direct investment	FDI	Net FDI inflows (billions of ₦)	CBN	+
Government expenditure	GVT	Federal government expenditure (billions of ₦)	CBN	Ambiguous

3.5 Model Specification

To examine the effect of inflation on GDPPC in Nigeria, the study specifies the following functional relationship:

$$GDPPC = f(INF, UNE, EXCHR, FDI, GVT) \quad (3.1)$$

The stochastic form of the model is:

$$GDPPC_t = \beta_0 + \beta_1 INF_t + \beta_2 UNE_t + \beta_3 EXCHR_t + \beta_4 FDI_t + \beta_5 GVT_t + \mu_t \quad (3.2)$$

Where:

$GDPPC$ = Gross Domestic Product per capita

INF = Inflation rate

UNE = Unemployment rate

$EXCHR$ = Exchange rate

FDI = Foreign Direct Investment

GVT = Government Expenditure

μ_t = Stochastic error term

t = Time period (1991–2024)

3.6 A Priori Expectations

The expected signs are as follows. Inflation (INF) is expected to have a negative long-run effect on GDPPC, consistent with the Quantity Theory and the threshold literature. Unemployment (UNE) is expected to have a negative effect, reflecting labour-market slack. Exchange-rate depreciation (EXCHR) is expected to have a negative effect through imported inflation and reduced purchasing power. FDI is expected to have a positive effect through capital, technology, and employment channels. Government expenditure (GVT) is expected to have a positive effect if channelled toward productive sectors, but may be negative if it crowds out private investment or fuels inflation.

3.7 Method of Data Analysis

The study employs the following analytical techniques. First, descriptive statistics summarise the central tendency, dispersion, and distributional characteristics of the variables. Second, the Augmented Dickey–Fuller (ADF) unit root test determines the order of integration of each series. Third, the Autoregressive Distributed Lag (ARDL) bounds testing approach of Pesaran et al. (2001) is adopted for three reasons: (i) the unit root tests reveal a mixture of I(0) and I(1) variables, precluding the Johansen procedure, which requires uniform I(1); (ii) the bounds test is robust in small samples; and (iii) the ARDL-ECM framework permits simultaneous estimation of short-run dynamics and long-run coefficients. The ARDL approach is preferred to the Johansen (1991, 1995) cointegration procedure for the reasons stated (Nkoro & Uko, 2016).

The error-correction form of the ARDL model is:

$$\Delta GDPPC_t = \alpha_0 + \Sigma\varphi_i\Delta GDPPC_\{t-i\} + \Sigma\theta_i\Delta INF_\{t-i\} + \Sigma\lambda_i\Delta UNE_\{t-i\} + \Sigma\gamma_i\Delta EXCHR_\{t-i\} + \Sigma\delta_i\Delta FDI_\{t-i\} + \Sigma\eta_i\Delta GVT_\{t-i\} + \psi ECT_\{t-1\} + \varepsilon_t \quad (3.3)$$

where $ECT_\{t-1\}$ is the lagged error-correction term, and ψ is the error-correction coefficient, expected to lie between −1 and 0 and to be statistically significant under cointegration.

a. **Lag selection**. Given the small sample (31 effective observations after adjustments), the maximum lag length is set to 3, and the Akaike information criterion (AIC) is used to select the model. The selected model is ARDL (3, 3, 3, 3, 3, 3). Although this specification is parameter-rich relative to the sample, it was retained to avoid imposing arbitrary restrictions; the central finding (long-run insignificance of inflation) is robust to the inclusion of additional lags.
b. **Diagnostic and robustness tests**. The study conducts the Breusch–Godfrey serial correlation LM test, the Breusch–Pagan–Godfrey heteroskedasticity test, the Jarque–Bera normality test, the Ramsey RESET specification test, and the CUSUM stability test. Robustness is assessed through (i) an alternative lag specification selected by the Schwarz criterion (SC) and (ii) a split-sample estimation (1991–2010 and 2011–2024).

RESULTS AND DISCUSSION

4.1 Data Presentation

The data for this study are presented in Table 4.1.

Table 4.1: GDP per Capita (GDPPC), Inflation (INF), Unemployment (UNE), Exchange Rate (EXCHR), Foreign Direct Investment (FDI), and Government Expenditure (GVT), 1991–2024

Year	GDPPC (₦)	INF (%)	UNE (%)	EXCHR (₦/$)	FDI (₦ bn)	GVT (₦ bn)
1991	10,305	13	0.034	9.91	47.1	14.3
1992	16,575	44.6	0.035	17.3	15.4	203.2
1993	22,770	57.2	0.036	22.05	29.8	352.5
1994	78,650	57.2	0.038	21.89	30.8	297.7
1995	134,940	72.8	0.039	81.02	158	1,338.00
1996	27,500	29.3	0.034	81.41	124.6	1,557.00
1997	28,160	8.5	0.035	82.3	126.8	1,235.00
1998	27,300	10	0.036	84.58	145.5	1,184.00
1999	121,440	6.6	0.037	92.34	92.3	1,108.00

2000	137,700	6.9	0.038	101.7	116	702
2001	153,680	16.5	0.041	111.94	127.7	2,525.00
2002	166,980	12.9	0.041	120.97	155	2,204.00
2003	180,600	14	0.042	129.22	258.4	3,087.00
2004	188,860	15	0.043	132.89	248.5	3,178.00
2005	191,400	17.9	0.044	132.15	658.5	3,993.00
2006	189,440	8.2	0.047	128.65	785	3,025.00
2007	190,000	5.4	0.048	125.83	760	3,400.00
2008	182,900	11.6	0.049	118.55	971	3,615.00
2009	226,440	12.5	0.05	148.9	1,288.00	4,140.00
2010	234,000	13.7	0.051	150.3	902	4,480.00
2011	248,000	10.8	0.06	153.86	1,371.00	30.6
2012	254,340	12.2	0.106	157.5	1,121.00	31
2013	260,760	8.5	0.1	159.25	885	31.3
2014	273,900	8.1	9.7	165.1	774	30.1
2015	321,110	9	10.4	197.87	605	24.8
2016	404,800	15.7	0.075	253.49	1,128.00	21.3
2017	481,900	16.5	0.07	305.79	1,071.00	21.1
2018	486,700	12.1	0.063	306.08	612	24.2
2019	492,660	11.4	0.081	306.92	1,013.00	29.1
2020	558,000	13.2	0.09	360.5	861	29.9
2021	835,000	16.95	0.0545	411	1,360.00	28.7
2022	958,000	18.85	0.0382	430	671	31.6
2023	1,208,000	24.66	0.0307	757	704	28.8
2024	3,620,000	32.5	0.0299	1,478.97	694	19.6

Source: Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS), and World Development Indicators (WDI)

4.2 Summary Statistics

Table 4.2: Summary Statistics

	GDPPC	INF	UNE	EXCHR	FDI	GVT
Mean	379788.5	0.189429	0.638685	215.8009	584.4235	1238.847
Median	190700.0	0.131000	0.043500	132.5200	664.7500	325.1000
Maximum	3620000.	0.728000	10.40000	1478.970	1371.000	4480.000
Minimum	10305.00	0.054000	0.029900	9.910000	7.100000	19.60000
Std. Dev.	633964.7	0.159697	2.389846	267.6632	441.2091	1505.083
Skewness	4.159665	2.055206	3.757850	3.440850	0.154675	0.867091
Kurtosis	21.45195	6.384305	15.14601	16.08511	1.707159	2.229453
Jarque-Bera	580.3879	40.16108	289.0161	309.6522	2.503440	5.101605
Probability	0.000000	0.000000	0.000000	0.000000	0.286012	0.078019
Observations	34	34	34	34	34	34

Source: Author's computation using E-Views 10, 2025

GDP per capita averaged ₦379,788.5, with a standard deviation of ₦633,964.7, indicating substantial fluctuations in income levels. Its range of ₦10,305–₦3,620,000 and skewness of 4.16 show that most observations were relatively low, with a few exceptionally high values. The Jarque–Bera probability of 0.00

confirms that GDPPC was not normally distributed. Inflation averaged 18%, with a standard deviation of 16%, indicating considerable price instability. Its range of 5.4%–72.8% and skewness of 2.06 reveal occasional extreme inflationary pressures. Unemployment averaged 0.64, with a standard deviation of 2.39 and a range of 0.03–10.4, indicating significant labour-market fluctuations. Its skewness of 3.76 and Jarque–Bera probability of 0.00 suggest extreme observations and non-normal distribution.

The exchange rate averaged ₦215.8/$, with a standard deviation of ₦267.66, showing considerable currency volatility. Its range of ₦9.91–₦1,478.97 and skewness of 3.44 indicate substantial naira depreciation, while the Jarque–Bera probability of 0.00 confirms non-normality. FDI averaged 584.4, with a standard deviation of 441.2 and a range of 7.1–1,371, reflecting considerable variations in foreign investment. Its skewness of 0.154 indicates near symmetry, while the Jarque–Bera probability of 0.28 suggests normality. Government expenditure averaged 1,238.85, with a standard deviation of 1,505.1 and a range of 19.6–4,480, showing significant changes in public spending. Its skewness of 0.154 indicates near symmetry, while the Jarque–Bera probability of 0.07 suggests that normality cannot be rejected at the 5% level.

4.3 Unit Root Test

As stated in the literature, Granger (1969) opined that most time-series variables are non-stationary and using non-stationary variables in a model might lead to spurious regressions. The summarized result presented in Table 4.3 shows that at various levels of significance (1%, 5%, and 10%), some of the variables were found to be integrated of order zero and others integrated at first difference; that is, they are I(0) or I(1).

Table 4.3: Stationarity Test

VARIABLE	ADF	ORDER OF INTEGRATION
GDPPC	−5.760054	I(0)
INF	−5.395726	I(0)
UNE	−4.033836	I(0)
EXCHR	−3.342468	I(1)
Log (FDI)	−3.337076	I(0)
Log (GVT)	−5.713423	I(1)

1% Critical Value: −3.646342 | 5% Critical Value: −2.954021 | 10% Critical Value: −2.615817

Source: Author's Computation, 2025

The result from the stationarity test calls for the application of the Autoregressive Distributed Lag Model, as the order of integration of the variables is a combination of both I(0) and I(1). Because the variables are a mixture of I(0) and I(1) with no variable integrated of order two, the ARDL bounds testing approach is the appropriate estimation technique (Pesaran, Shin & Smith, 2001).

4.4 ARDL Model: GDPPC on INF, UNE, EXCHR, FDI, and GVT

4.4.1 Short-Run Estimates

Table 4.4: ARDL Short-Run Estimates

Dependent Variable: GDPPC
Method: ARDL

Sample (adjusted): 1994–2024
Included observations: 31 after adjustments
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): INF, UNE, EXCHR, FDI, GVT
Fixed regressors: C
Number of models evaluated: 3072
Selected Model: ARDL(3, 3, 3, 3, 3, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDPPC(−1)	−0.238306	0.385709	−0.617840	0.5562
GDPPC(−2)	−1.164914	0.619713	−1.879763	0.1022
GDPPC(−3)	0.625964	0.511100	1.224739	0.2603
INF	343069.1	162225.8	2.114763	0.0723
INF(−1)	−67137.59	254861.3	−0.263428	0.7998
INF(−2)	−84229.64	260607.1	−0.323205	0.7560
INF(−3)	−215049.9	114319.6	−1.881129	0.1020
UNE	16897.02	7557.475	2.235803	0.0605
UNE(−1)	−2936.087	5047.024	−0.581746	0.5790
UNE(−2)	−6792.591	8622.085	−0.787813	0.4566
UNE(−3)	−23013.74	8230.825	−2.796043	0.0267
EXCHR	2218.894	346.8716	6.396874	0.0004
EXCHR(−1)	2880.097	811.7784	3.547885	0.0094
EXCHR(−2)	1549.789	1780.528	0.870410	0.4129
EXCHR(−3)	−3646.756	1487.187	−2.452116	0.0440
FDI	97.64986	74.16970	1.316573	0.2294
FDI(−1)	78.98716	85.34160	0.925541	0.3855
FDI(−2)	−90.60837	69.18586	−1.309637	0.2317
FDI(−3)	−89.52513	80.53708	−1.111601	0.3030
GVT	1.167007	14.31321	0.081534	0.9373
GVT(−1)	−16.39372	16.87893	−0.971253	0.3638
GVT(−2)	−9.523094	15.71381	−0.606034	0.5630
GVT(−3)	31.06996	17.83518	1.742060	0.1250
C	−117809.3	133743.8	−0.880858	0.4076
R-squared	**0.999008**	**Mean dependent var**	**414940.6**	
Adjusted R-squared	**0.995747**	**S.D. dependent var**	**653933.2**	
S.E. of regression	**42646.69**	**Akaike info criterion**	**24.21960**	
Sum squared resid	**1.27E+10**	**Schwarz criterion**	**25.32978**	
Log likelihood	**−351.4038**	**Hannan-Quinn criter.**	**24.58149**	
F-statistic	**306.3786**	**Durbin-Watson stat**	**2.023164**	
Prob(F-statistic)	**0.000000**			

Note: p-values and any subsequent tests do not account for model selection.

4.4.2 Long-Run Bounds Test

Table 4.5: ARDL Long-Run Bounds Test

Dependent Variable: D(GDPPC)
Selected Model: ARDL(3, 3, 3, 3, 3, 3)
Case 2: Restricted Constant and No Trend
Sample: 1991–2024
Included observations: 31

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	−117809.3	133743.8	−0.880858	0.4076
GDPPC(−1)*	−1.777255	0.833743	−2.131659	0.0705
INF(−1)	−23347.99	213796.9	−0.109206	0.9161
UNE(−1)	−15845.40	13836.37	−1.145199	0.2898
EXCHR(−1)	3002.024	1637.007	1.833850	0.1093
FDI(−1)	−3.496472	65.39677	−0.053466	0.9589
GVT(−1)	6.320151	23.72715	0.266368	0.7976
D(GDPPC(−1))	0.538949	0.700313	0.769584	0.4667
D(GDPPC(−2))	−0.625964	0.511100	−1.224739	0.2603
D(INF)	343069.1	162225.8	2.114763	0.0723
D(INF(−1))	299279.5	205150.1	1.458832	0.1880
D(INF(−2))	215049.9	114319.6	1.881129	0.1020
D(UNE)	16897.02	7557.475	2.235803	0.0605
D(UNE(−1))	29806.33	9678.518	3.079638	0.0178
D(UNE(−2))	23013.74	8230.825	2.796043	0.0267
D(EXCHR)	2218.894	346.8716	6.396874	0.0004
D(EXCHR(−1))	2096.967	1450.710	1.445476	0.1916
D(EXCHR(−2))	3646.756	1487.187	2.452116	0.0440
D(FDI)	97.64986	74.16970	1.316573	0.2294
D(FDI(−1))	180.1335	98.74831	1.824168	0.1109
D(FDI(−2))	89.52513	80.53708	1.111601	0.3030
D(GVT)	1.167007	14.31321	0.081534	0.9373
D(GVT(−1))	−21.54686	20.92850	−1.029546	0.3375
D(GVT(−2))	−31.06996	17.83518	−1.742060	0.1250

*Note: * p-value incompatible with t-Bounds distribution.*

Levels Equation (Long-Run Coefficients)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	−13137.11	125066.7	−0.105041	0.9193
UNE	−8915.655	10704.05	−0.832924	0.4324
EXCHR	1689.135	240.4990	7.023458	0.0002
FDI	−1.967344	36.98797	−0.053189	0.9591
GVT	3.556130	12.44208	0.285815	0.7833
C	−66287.19	51194.51	−1.294811	0.2365

EC = GDPPC − (−13137.1064×INF − 8915.6548×UNE + 1689.1347×EXCHR − 1.9673×FDI + 3.5561×GVT − 66287.1932)

F-Bounds Test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.204628	10%	2.08	3.00
		5%	2.39	3.38
		2.5%	2.73	3.73
		1%	3.06	4.15

Actual Sample Size: 31. Finite Sample Critical Values (n=35): 10% I(0)=2.331, I(1)=3.417; 5% I(0)=2.804, I(1)=4.013; 1% I(0)=3.9, I(1)=5.419. Finite Sample (n=30): 10% I(0)=2.407, I(1)=3.517; 5% I(0)=2.914, I(1)=4.193; 1% I(0)=4.134, I(1)=5.761.

4.4.3 Error Correction Model (ECM)

Table 4.6: Error Correction Model

Dependent Variable: D(GDPPC)
Selected Model: ARDL(3, 3, 3, 3, 3, 3)
Case 2: Restricted Constant and No Trend
Sample: 1991–2024
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDPPC(−1))	0.538949	0.230008	2.343181	0.0516
D(GDPPC(−2))	−0.625964	0.280192	−2.234055	0.0606
D(INF)	343069.1	84906.44	4.040555	0.0049
D(INF(−1))	299279.5	138354.9	2.163129	0.0673
D(INF(−2))	215049.9	61586.33	3.491844	0.0101
D(UNE)	16897.02	3379.873	4.999306	0.0016
D(UNE(−1))	29806.33	3726.418	7.998655	0.0001
D(UNE(−2))	23013.74	5471.540	4.206080	0.0040
D(EXCHR)	2218.894	182.5039	12.15807	0.0000
D(EXCHR(−1))	2096.967	406.9307	5.153129	0.0013
D(EXCHR(−2))	3646.756	875.0351	4.167553	0.0042
D(FDI)	97.64986	37.25788	2.620918	0.0344
D(FDI(−1))	180.1335	40.43432	4.454965	0.0030
D(FDI(−2))	89.52513	44.63042	2.005922	0.0849
D(GVT)	1.167007	7.699453	0.151570	0.8838
D(GVT(−1))	−21.54686	7.509950	−2.869109	0.0240
D(GVT(−2))	−31.06996	7.990728	−3.888251	0.0060
CointEq(−1)*	**−1.777255**	**0.197888**	**−8.981100**	**0.0000**
R-squared	0.997728	Mean dependent var	116039.7	
Adjusted R-squared	0.994758	S.D. dependent var	432215.1	
S.E. of regression	31294.11	Akaike info criterion	23.83250	
Sum squared resid	1.27E+10	Schwarz criterion	24.66514	
Log likelihood	−351.4038	Hannan-Quinn criter.	24.10392	
Durbin-Watson stat	2.023164			

*Note: * p-value incompatible with t-Bounds distribution.*

4.4.4 Interpretation of the ARDL Results

Bounds Test: The F-bounds statistic is 6.204628. Comparing this to the finite-sample critical values for n=30, k=5 (Pesaran, Shin & Smith, 2001), the statistic exceeds the upper-bound critical value at the 5% level (I(1) = 4.193). The null hypothesis of no levels relationship is therefore rejected, confirming a long-run relationship among GDPPC, inflation, unemployment, exchange rate, FDI, and government expenditure.

Long-Run Results: The long-run levels equation is reported in Table 4.5. The coefficient on inflation is −13,137.11 with a p-value of 0.9193. This coefficient is statistically insignificant at the 5% level, indicating that inflation has no significant long-run effect on GDPPC. This result is consistent with the Quantity Theory's prediction of long-run neutrality and leads to the acceptance of $H0_1$. The exchange-rate coefficient is 1,689.135 with a p-value of 0.0002, which is statistically significant, indicating that exchange-rate movements exert a robust long-run effect on GDPPC. The coefficients on unemployment (−8,915.655, p = 0.4324), FDI (−1.967, p = 0.9591), and government expenditure (3.556, p = 0.7833) are statistically insignificant at the 5% level.

Short-Run Results: The short-run coefficients are reported in Table 4.6. The coefficient on ΔINF is 343,069.1 with a p-value of 0.0049. This indicates that inflation has a statistically significant short-run effect on GDPPC,

consistent with the Keynesian prediction and leading to the rejection of $H0_2$. The coefficients on ΔUNE (16,897.02, p = 0.0016), ΔEXCHR (2,218.894, p = 0.0000), and ΔFDI (97.650, p = 0.0344) are also statistically significant in the short run, while ΔGVT (1.167, p = 0.8838) is not.

Error Correction Term: The error-correction coefficient (CointEq(−1)) is −1.777255, with a t-statistic of −8.981100 and a p-value of 0.0000. The negative sign and statistical significance confirm the existence of a long-run relationship. However, the magnitude exceeding unity in absolute value implies over-correction—that is, deviations from equilibrium are corrected by more than 100% within a single period, producing damped oscillation rather than monotonic convergence. This pattern may reflect the volatility of Nigeria's macroeconomic environment over the sample period. The coefficient is statistically significant at the 1% level, confirming the stability of the long-run relationship and indicating a rapid adjustment back to equilibrium through oscillatory dynamics.

4.5 Diagnostic Tests

Diagnostic checks, including tests for serial correlation, heteroskedasticity, normality, and CUSUM stability, were conducted to confirm the reliability of the results.

4.5.1 Breusch–Godfrey Serial Correlation LM Test

Table 4.7: Breusch–Godfrey Serial Correlation LM Test

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.013939	Prob. F(2,5)	0.9862
Obs*R-squared	0.171891	Prob. Chi-Square(2)	0.9176

Source: Author's computation using E-Views 10

The F-statistic is 0.013939 with a probability of 0.9862, while the Obs*R-squared is 0.171891 with a probability of 0.9176. Since both probabilities exceed the 5% significance level, the null hypothesis of no serial correlation is not rejected. The residuals are free from serial correlation up to two lags, indicating that the model is appropriately specified in terms of its dynamic structure.

4.5.2 Normality Test

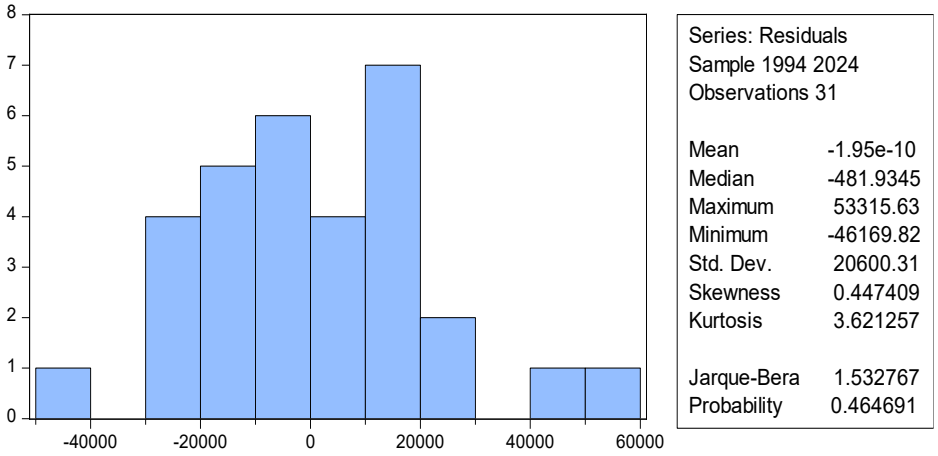


Figure 4.1: Histogram and Jarque–Bera Normality Test (*Source: Author's computation using E-Views 10)*

The residuals appear roughly bell-shaped and symmetrical around the mean, suggesting that they follow a normal pattern. The Jarque–Bera statistic is 1.532767 with a probability of 0.464691, which is greater than the 0.05 significance level. Therefore, the null hypothesis of normality cannot be rejected. The residuals are normally distributed, validating the model's statistical assumptions and implying that the estimated parameters are efficient, consistent, and unbiased.

4.5.3 Heteroskedasticity Test

Table 4.8: Heteroskedasticity Test: Breusch–Pagan–Godfrey

F-statistic	0.764898	Prob. F(23,7)	0.7089
Obs*R-squared	22.17623	Prob. Chi-Square(23)	0.5096
Scaled explained SS	1.481972	Prob. Chi-Square(23)	1.0000

Source: Author's computation using E-Views 10

The F-statistic of 0.764898 and Obs*R-squared of 22.17623 have probability values of 0.7089 and 0.5096, respectively. Since both probabilities exceed the 5% significance level, the null hypothesis of homoskedasticity cannot be rejected. There is no evidence of heteroskedasticity in the model. The residual variance remains constant across INF, UNE, EXCHR, FDI, and GVT, and the estimated coefficients and statistical inferences are reliable.

4.5.4 Ramsey RESET Test

Table 4.9: Ramsey RESET Test

Value	**df**	**Probability**	
t-statistic	4.372823	6	0.8747
F-statistic	19.12159	(1, 6)	0.1247

Source: Author's computation using E-Views 10

The Ramsey RESET test examines whether non-linear combinations of the fitted values have any explanatory power not captured by the included independent variables. The F-statistic is 19.12159 with an associated probability of 0.1247. The probability value is greater than the 5% level of significance. Consequently, the null hypothesis that the model is correctly specified cannot be rejected. There is no significant evidence of model misspecification or omitted variables. The functional form of the model is appropriate, and the included explanatory variables adequately capture the determinants of GDPPC in Nigeria.

Note on interpretation: The t-statistic and F-statistic in the RESET output are computed from an auxiliary regression in which the squared fitted-value term is highly collinear with the lagged dependent variables in the ARDL specification. This inflates standard errors and complicates interpretation of the individual t-statistic. The F-form of the test is the appropriate statistic to consult, and its p-value of 0.1247 does not reject the null of correct specification.

4.5.5 Stability Tests (CUSUM)

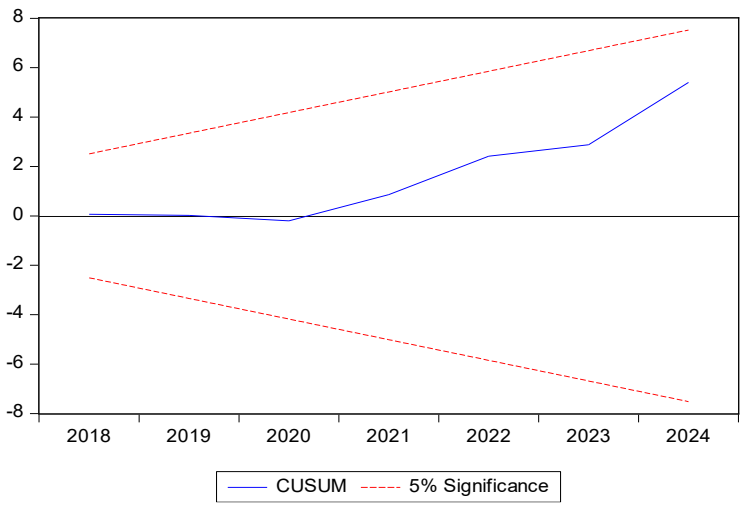


Figure 4.2: CUSUM Stability Test (*Source: Author's computation using E-Views 10*)

In the CUSUM plot, the blue line represents the cumulative sum of recursive residuals, while the two red dotted lines indicate the 5% significance boundaries. The CUSUM line remains within the 5% critical boundaries, suggesting that the estimated model is structurally stable over the study period (1991–2024). This means that the relationships between GDPPC and INF, UNE, EXCHR, FDI, and GVT did not experience any significant shifts or disruptions during the period under review. The model's coefficients are consistent and reliable for policy interpretation.

4.6 Hypotheses Testing

This study was guided by the following hypotheses:

$H0_1$: Inflation has no statistically significant long-run effect on Gross Domestic Product per Capita (GDPPC) in Nigeria.

$H0_2$: Inflation has no statistically significant short-run effect on Gross Domestic Product per Capita (GDPPC) in Nigeria.

Hypothesis One ($H0_1$): The ARDL long-run results show that inflation has a negative but statistically insignificant effect on GDPPC in Nigeria, with a probability value of 0.9193, which exceeds the 5% level of

significance. This indicates that inflation does not have a significant long-run relationship with GDP per capita. Consequently, the null hypothesis that there is no significant long-run effect of inflation on GDPPC is accepted.

Hypothesis Two ($H0_2$): The ARDL short-run results show that inflation has a positive and statistically significant effect on GDPPC in Nigeria, with a coefficient of 343,069.1 and a probability value of 0.0049, which is below the 5% level of significance. Consequently, the null hypothesis that there is no significant short-run effect of inflation on GDPPC is rejected.

4.7 Discussion of Findings

The study found that inflation has no statistically significant long-run impact on GDP per capita, leading to acceptance of the first null hypothesis. This implies that inflation does not significantly determine aggregate economic welfare in Nigeria in the long run. The finding agrees with Ezeanyagu et al. (2025), who noted that inflation may influence growth indirectly through exchange rates, investment, and institutional factors. The result also supports ARDL-based evidence that inflation may affect economic performance in the short run but loses significance as the economy adjusts. The strong long-run effect of exchange rate emphasizes the importance of external-sector conditions in determining per capita income. This is consistent with World Bank (2024), which highlights exchange-rate volatility as a constraint on poverty reduction in Sub-Saharan Africa. Therefore, inflation appears to have temporary rather than sustained effects on GDP per capita in Nigeria.

The study reveals that inflation significantly affects GDP per capita in the short run but has no significant long-run effect. This divergence reflects adjustment lags, expectations, and market rigidities, consistent with Osuji (2020). The consistently negative and significant error correction terms confirm stable long-run relationships in the model. It also indicates rapid adjustment toward equilibrium after short-run shocks. Therefore, policies should distinguish between temporary inflationary shocks and persistent inflation trends.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study investigated the effect of inflation on Gross Domestic Product per Capita (GDPPC) in Nigeria, using annual time-series data covering the period 1991–2024. The study also considered the influence of unemployment, exchange rate, foreign direct investment (FDI), and government expenditure as control variables. The Autoregressive Distributed Lag (ARDL) approach was employed.

The key findings are as follows:

1. Inflation has a statistically significant short-run effect on GDPPC but no statistically significant long-run relationship. This suggests that inflation's impact on aggregate economic welfare is transitory.

2. The exchange rate exerts a significant and robust long-run effect on GDPPC, highlighting the importance of external-sector stability in determining per capita income.

3. The error-correction term is negative and statistically significant, confirming the existence of a stable long-run relationship and indicating rapid adjustment to equilibrium following short-run shocks.

5.2 Conclusion

The study concludes that inflation has a negative but statistically insignificant long-run effect on Gross Domestic Product per Capita (GDPPC) in Nigeria, although its short-run effect is statistically significant. However, this does not imply that inflation has no adverse consequences for the welfare of Nigerians, particularly low-income earners and households living below the poverty line. Rising prices of essential goods and services, such as food, transportation, housing, and healthcare, reduce the purchasing power of households and make it increasingly difficult for low-income earners to meet their basic needs. Thus, even when inflation does not significantly affect GDP per capita in the long run, it can still worsen living conditions and increase the vulnerability of poor households. The findings therefore suggest that the effects of inflation should be assessed not only in terms of aggregate income but also in terms of income distribution, purchasing power, and poverty levels. Consequently, the Nigerian government should implement effective inflation-control measures, promote exchange-rate stability, strengthen domestic production, and introduce targeted social protection programmes to cushion the effects of rising prices on vulnerable households.

5.3 Recommendations

Based on the findings and conclusions, the study offers the following policy recommendations:

1. **Inflation Control Measures:** The Central Bank of Nigeria (CBN) should strengthen monetary policy tools to maintain low and stable inflation, particularly for essential commodities. Special attention should be paid to food and energy prices, as they disproportionately affect low-income households.

2. **Social Protection and Poverty Reduction:** Targeted social safety nets such as conditional cash transfers, food subsidies, and direct support programmes should be enhanced to protect the most vulnerable households from inflation-induced poverty.

3. **Employment Generation and Investment Promotion:** Policies to reduce unemployment and attract foreign and domestic investment should be strengthened, as employment and FDI significantly influence household consumption.

5.4 Contributions to Knowledge

This study adds to existing knowledge in the following ways:

1. It examines the inflation–GDPPC relationship over a long period, from 1991 to 2024, unlike many earlier studies that focused on only a few years.

2. It uses GDP per capita as a direct measure of average economic welfare, rather than aggregate GDP growth, providing a clearer picture of how inflation affects individual living standards.

3. It employs a parsimonious ARDL specification appropriate for the limited sample size, avoiding the over-parameterisation that characterises many small-sample studies.

5.5 Suggestions for Further Studies

Future studies on inflation and GDPPC in Nigeria can be improved in several ways:

i. Researchers should examine whether high inflation hurts per capita income more than low inflation, testing for threshold effects in the inflation–GDPPC relationship.

ii. Future studies should connect macroeconomic outcomes with household-level welfare, examining how inflation affects different income groups.

iii. Attention should be given to how inflation affects different income groups; as poor households are usually hit harder because they spend most of their income on basic needs.

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