

INFLATION IN NIGERIA: CHALLENGES AND PROSPECTS FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

This study assesses the challenges and prospects of Inflation on Nigeria's Sustainable Development Agenda. Sustainable development is proxied using the Sustainable Development Index. The research adopts secondary data from sources, including the Central Bank of Nigeria, the National Bureau of Statistics, and the World Bank. The data used in the study covers a period from 1997 to 2023.

The Autoregressive Distributed Lag (ARDL) model is employed to analyze the relationship between Inflation and Sustainable Development. GDP, Foreign Direct Investment, and Exchange rates were used as control variables used to account for the overall economic performance of Nigeria. This is to control for the influence of economic growth on sustainable development while focusing on the impact of inflation.

Also, the validity and reliability of the data are ensured through the application of the Augmented Dickey-Fuller test (ADF), Heteroscedascity Test and Multicollinearity Test.

The research findings reveal a significant negative impact of inflation on Nigeria's Sustainable Development Agenda. These results highlight the crucial role of Inflation control in the pursuit of sustainable development objectives in the Nigerian context.

This study contributes to the existing body of knowledge regarding the interplay between inflation and sustainable development outcomes and may provide insights for policymakers and stakeholders in Nigeria seeking to foster sustainable development in the face of economic challenges.

Keywords: Nigeria, Inflation, Sustainable Development Goals (SDGs), Central Bank of Nigeria, Policy.

1. INTRODUCTION

Inflation, as a fundamental economic indicator, holds considerable significance in the realm of economic development and policy formulation. In the context of Nigeria, a country with a diverse and complex economic landscape, the implications of inflation on the nation's sustainable development agenda cannot be overstated. This research endeavors to delve into the intricate relationship between inflation and Nigeria's sustainable development agenda, shedding light on the multifaceted impacts that inflation can have on the nation's pursuit of long-term economic, social, and environmental objectives.

Nigeria, as one of the most populous and resource-rich nations in Africa, has set ambitious goals for sustainable development. The Sustainable Development Goals (SDGs) outlined by the United Nations have been embraced by Nigeria as a roadmap for its development trajectory, encompassing various dimensions such as poverty eradication, equitable growth, environmental

sustainability, and social inclusion. These objectives are underpinned by economic stability and growth, and inflation plays a critical role in determining the extent to which they can be achieved. Inflation, defined as the persistent increase in the general price level of goods and services, can impact various aspects of Nigeria's sustainable development agenda. Fluctuations in prices can erode the purchasing power of consumers, affecting their ability to access basic necessities, education, healthcare, and other essential services. Furthermore, inflation can disrupt macroeconomic stability, making it challenging for the government to allocate resources effectively and sustain economic growth, which is pivotal to achieving the SDGs.

This research aims to provide a comprehensive assessment of the challenges and prospects of inflation on Nigeria's sustainable development agenda. By examining historical data, economic policies, and various factors influencing inflation, this study seeks to uncover the nuanced relationships between inflation and sustainable development outcomes in Nigeria.

Furthermore, it will explore potential policy measures and strategies that can mitigate the adverse effects of inflation on the country's progress toward its development objectives. The findings of this research hold significance for policymakers, economists, development practitioners, and stakeholders in Nigeria, offering valuable insights into the intricate interplay between inflation and sustainable development.

As Nigeria strives to navigate the complexities of its economic landscape and advance its sustainable development agenda, a deeper understanding of the role of inflation is essential to inform evidence-based policy decisions and promote the well-being of its citizens.

2. LITERATURE REVIEW

Sustainable development is currently a key focus for governments, who are implementing policies to achieve broader economic goals, including price stability, high employment, and sustainable economic growth. These efforts encompass various strategies such as monetary and fiscal policies, financial institution regulations, trade policies, and tax policies. National central banks are actively engaged in managing inflation growth, though their success in this endeavor has been limited (Stasys et al., 2022).

Modern forms of inflation differ significantly from historical ones, but the fundamental causes and consequences of inflation remain pertinent (Oresme, 2020). Additionally, understanding of the underlying forces driving inflation remains imperfect (Yellen, 2017).

Since the 1970s, the subject of how to lower inflation has been a major concern for policymakers. Although the data available indicate that there was, on average, moderate inflation in Nigeria's economy before SAP, the adverse effects of inflation have subsequently taken on an unbearable magnitude (Afolabi & Efunwoye, 1995).

Many authorities have ascribed it to the rise in public spending brought on by higher oil revenues, which led to a significant increase in aggregate demand and an inelastic demand for domestic output. The monetization of oil profits led to a rapid increase in the money supply, which in turn put upward pressure on the level of prices generally.

Inflation is a significant macroeconomic issue that has been a concern and a difficulty for both established and developing nations worldwide over the years, particularly in Nigeria. One of the causes of economic imbalance, a declining standard of living, an economic crisis, and the devaluation of local currencies in terms of their domestic and international value is inflation, which is simply defined as a sustained increase in the level of prices of general goods and services over

some time (Blanchard et al., 2009).

The Nigerian economy has been plagued by inflation over the years or rather, it has brought it to its knees because the country's inflation rate has been erratic and typically double-digit (Umo, 2007).

A wide range of empirical studies has identified exchange rate volatility as one of the key and major factors that account for the variations or increases in the general price level, even though the fact that some economic literature and theories view inflation as being a monetary phenomenon. This is because exchange rate system fluctuations for an import-based economy like Nigeria lead to a lack of confidence in our financial system and discourage foreign direct investment.

There is a high level consensus among many economists, central bankers, policy makers and practitioners that one of the fundamental objective of macroeconomic policies in both the developed and developing economies is to sustain high economic growth together with low, one-digit inflation. This is because a high level of inflation disrupts the smooth functioning of a market economy (Omoke, 2010).

At the individual level, inflation exerts a heavy toll on those with fixed income. Inflation relatively favour debtors at the expense of creditors. At the firm level, the effect of inflation is called the 'menu cost' because it affects output when firms have to incur costs as they adjust to the new price level (e.g. changing their price lists for customer) (Omoke, 2010).

However, much less agreement exists about the precise relationship between inflation and economic performance, and the mechanism by which inflation affects economic activity at the macroeconomic level. This has generated a significant debate both theoretically and empirically.

The results of numerous research indicate that the money supply has a substantial role in explaining inflation in both developed and developing countries. One of these studies is that of Chhibber (1991), who created a thorough econometric model to examine the causes of inflation in Zimbabwe while also accounting for monetary and structural issues. Their analysis reveals that the main factors influencing inflation in this nation are monetary growth, international price, exchange rate, interest rate, unit labor cost, and real income.

Chhibber and Shafik (1990) used a comparable macroeconomic model of inflation for Ghana. According to this study, which looked at the years 1965 through 1988, one important factor in the inflationary process in Ghana is the expansion of the money supply. Real wages and the official exchange rate are not able to have a major impact on inflation. However, a strong positive correlation between the parallel exchange rate and the overall price level was discovered.

Elbadawi (1990) demonstrated that the abrupt depreciation of the parallel exchange rate was the primary cause of inflation in his writing on the inflationary process, stabilization, and the role of state expenditure in Uganda. The conclusions of Chhibber and Shaffik (1990) regarding Ghana are supported by this conclusion.

Regarding inflation, Chhibber (1991) asserted that there is only one connection between the exchange rate and inflationary prices. One of his primary findings, which he bases on empirical research on a few African nations, is that devaluation may, in the near term, impose upward pressure on the general price level due to its higher cost of production. According to Chhibber, the degree to which a local currency depreciation may cause inflation depends primarily on how these policy actions will affect the government's budgetary revenues and expenditures as well as its concurrent monetary policy.

Shitundu and Luvanda (2000) used the Least Trimmed Squares (LTS) method, as introduced by

Rousseuw and Leroy (1987), which detects regression outliers and produces robust regression, to examine the impact of inflation on economic growth in Tanzania. The empirical results obtained suggest that inflation has been harmful to economic growth in Tanzania.

Barro (1995) explored the inflation-economic growth relationship using a large sample covering more than 100 countries from 1960 to 1990. His empirical findings indicate that there exists a statistically significant negative relationship between inflation and economic growth if a certain number of the country characteristics (e.g., fertility rate, education, etc.) are held constant.

More specifically, an increase in the average inflation by 10 percentage points per year reduces the growth rate of real per capita GDP by 0.2 to 0.3 percentage points per year. In other words, his empirical analysis suggests that the estimated relationship between inflation and economic growth is negative when some reasonable instruments are considered in the statistical process. Finally, he added that there is at least some reason to consider that higher long-term inflation reduces economic growth.

Bruno and Easterly (1995) examined the determinants of economic growth using annual CPI inflation of 26 countries which experienced inflation crises during the period between 1961 and 1992. In their empirical analysis, inflation rate of 40 percent and over is considered as the threshold level for an inflation crisis. They find inconsistent or somewhat inconclusive relationship between inflation and economic growth below this threshold level when countries with high inflation crises are excluded from the sample.

In addition, the empirical analysis suggests that there exists a temporal negative relationship between inflation and economic growth beyond this threshold level. The robustness of the empirical results is examined by controlling for other factors such as shocks (e.g., terms of trade shocks, political crises, and wars). Finally, they found that countries recover their pre-crisis economic growth rates following successful reduction of high inflation and there is no permanent damage to economic growth due to discrete high inflation crises.

Throughout history, attitudes toward inflation have been variable, but the monetary approach to inflation has predominantly prevailed. The Keynesian approach and economic regulation theories have also contributed to the understanding of inflation. Inflation serves as a crucial indicator of a nation's economic well-being, reflecting a macro-level dimension of sustainability. A sustained increase in the general price level of goods and services, resulting in reduced purchasing power of a currency unit, reflects the overall performance of the economy (Stasys et al., 2022).

Economists often liken inflation to a temperature gauge, indicative of underlying economic factors. The customary gauge for inflation is the inflation rate, typically measured as the annual percentage change in the general price index, often represented by the consumer price index (CPI). The CPI is a statistically weighted estimate of specific goods and services, reflecting fluctuations in their prices (Stasys et al., 2022).

Scholars concur that inflation can have both negative and positive effects on the economy. High inflation may deter savings and future investments, potentially causing shortages of goods as consumers anticipate price increases. Conversely, moderate inflation has been observed to stimulate economic activity and reduce unemployment. However, there are recent opinions suggesting that economic recovery may actually accelerate inflation (Stasys et al., 2022).

Economists, including Jarocinski & Lenza (2018), Bobeica et al. (2019), and Ang et al. (2007) assert that low or moderate inflation rates are influenced by a wide range of factors. In contrast, economists aligned with the Austrian School of Economics generally attribute prolonged and

exceptionally high inflation to excessive growth in the money supply (Garcia et al., 2017). According to their viewpoint, just as in any economic production, cooperative competition among market participants yields far superior results compared to state regulation. They contend that escalating prices directly result from monetary inflation and artificially low-interest rates.

State interference in the money supply through excessive printing typically results in an increased total money supply compared to what would have occurred in a free market, leading to inflation. Inflation devalues money, reduces trade activity, diminishes overall productivity, and is ultimately detrimental.

Austrian economists firmly believe that due to ongoing technological advancements, prices should naturally decline. They argue that inflation contributes to the depreciation of fixed capital, impedes savings growth, and functions as a tax that erodes the purchasing power of money while distorting economic predictions (Božović, 2020).

The Austrian school's stance on inflation has been molded by centuries of debasing precious metals in coins or diminishing the backing of paper money with reliable assets (Girdzijauskas et al., 2018). Nonetheless, there is no consensus regarding the causes of inflation (Ha et al., 2019).

Money has evolved as a universal medium of exchange to facilitate trade. For an extended period, money held intrinsic value, primarily due to its composition of valuable and durable materials, particularly precious metals. With the abandonment of the gold standard, money has effectively lost its intrinsic value, especially when it exists solely as digital records in bank accounts. Nonetheless, inflation persists, but its origins have shifted to factors such as cash flow and the supply-demand dynamics of goods and services (Auer et al., 2017). Consequently, despite fundamental changes post-gold standard, the historical understanding of inflation's nature endures (Stasys et al., 2022).

Up until the 20th century, inflation was predominantly perceived as a purely monetary phenomenon and regarded negatively. This outlook began to shift with the advent of Keynes's theory (Wardhono et al., 2021). Keynesian theory advocated substantial government intervention in a market economy to control inflation. The state employs various economic policies, financial instruments, and monetary tools, including indirect ones, with the primary focus on stimulating solvent demand. An additional issuance of money is employed for this purpose. According to this theory, in situations of underemployment, an increase in the money supply does not primarily lead to price hikes but rather stimulates production and the supply of goods. In high unemployment scenarios, consumption remains modest, while the expansion of production is encouraged.

In theory, inflation signifies an imbalance between aggregate demand and aggregate supply. Neoclassical economists explain inflation as a consequence of increased production costs, constituting a supply-side change. In contrast, Keynes' followers argue that inflation arises from heightened demand at full employment, resulting in two primary inflation theories: demand-driven and cost-driven inflation (Mayer et al., 1995).

Proponents of Keynesian theory argue that consumption and government spending drive economic growth and that a country's economic power is determined by an increased GDP. They view austerity measures as hindrances to economic development and advocate deficit spending while maintaining artificially low-interest rates to bolster aggregate demand. This perspective gave rise to the concept of controlled inflation (Girdzijauskas et al., 2018).

Controlled inflation can be regarded as stable inflation, with positive impacts on people's expectations. Stable inflation allows individuals to realistically assess their expenditures and

income, fostering saving and investment. It also stimulates economic growth. Conversely, it is worth noting that controlled economic growth can lead to inflation (Junankar & Wong, 2020). Indeed, despite the efforts of many governments, controlled inflation escalated into rampant inflation in the late 1970s, prompting a critical reevaluation of certain aspects of Keynesian theory. Nevertheless, despite its flaws, Keynes's theory remains noteworthy for several key insights (Girdzijauskas et al., 2018).

Therefore, a major factor identified in almost all the papers is the strong influence of inflation on sustainable development.

3. EVOLUTION OF SUSTAINABLE DEVELOPMENT GOALS IN NIGERIA

The Sustainable Development Goals are an international initiative to put an end to poverty, safeguard the environment and climate, and guarantee that everyone can live in peace and prosperity. Nigeria suffers a wide range of socioeconomic issues, such as social inequality, poverty, and unemployment. To solve these problems, sustainable development in Nigeria encourages inclusive growth, poverty reduction, and social fairness. Access to clean water, healthcare, and education is being improved, particularly in rural areas.

Initiatives are also being taken to encourage sustainable lives, entrepreneurship, and job development, especially in industries like agriculture, renewable energy, and eco-tourism. To promote economic growth while reducing negative environmental effects, initiatives are being taken to increase infrastructure, help small and medium-sized businesses, and draw in investments. Nigeria also actively participates in international environmental projects. The nation has ratified numerous international agreements, including the Sustainable Development Goals (SDGs) and the Paris Agreement on climate change. These pacts give Nigeria a framework for aligning its policies and practices with international sustainability goals, fostering cooperation with other countries and international organizations.

Despite its gains, Nigeria still has a long way to go before it can achieve sustainable development. Sustainable practices are hampered by the nation's quick population increase, poor infrastructure, and governance problems. Financial resources, technical improvements, widespread awareness, and involvement from both the public and commercial sectors are also necessary for the transition to a more sustainable.

Nigeria's economy aspires to be one of the 20 largest by 2020, according to Vision 2020:20. Despite this vision, since 2015 the economy has been declining. It experienced a severe economic downturn in 2017, which caused it to drop from 22nd place in the world in terms of GDP in 2015 to 27th place at the end of 2016.

Nigeria ranked 46th, 142nd, and 176th out of 181 nations in 2014, 2015, and 2016, respectively, according to the real GDP per capita and other socioeconomic metrics that reflect a country's true situation. A high death rate and a life expectancy of 52.5 are also present (WDI, 2017). According to data from the National Bureau of Statistics, over 6 million children under the age of five had stunted growth, 11.4 million individuals in Nigeria were undernourished between 2014 and 2016, over 18.8% of the population is unemployed, and around 52.65% of youths are unemployed.

Additionally, according to the global competitiveness index, Nigeria's economy was placed 127th out of 138 nations as of 2016, which is inferior to its position of 124th out of 140 in 2015. These data demonstrate that the Nigerian economy is continually moving away from its 2020:20 aim rather than closer to it, which creates a very significant concern.

Most academics and policy experts view bad macroeconomic management and policies as the primary sources of the issue and, as a result, think that rational, practical, and workable macroeconomic policies still hold the key to the solution.

In Nigeria, sustainable development is an ongoing process that aims to strike a balance between social advancement, environmental preservation, and economic expansion. Addressing environmental deterioration, advancing social fairness, and fostering economic diversification are all part of it.

In recent times, Nigeria is striving for a more sustainable future that assures the welfare of its citizens, protects its natural heritage, and advances global sustainability goals through legislation, initiatives, and international partnerships.

4. ESTIMATION METHODS AND EMPIRICAL MODEL

This study involved quantitative data processing. The descriptive statistic and regression analytical model were adopted. The regression analytical models was used to estimate the relationship between the level of sustainable development attainment and the identified macroeconomic factor of influence such as exchange rate and inflation. The descriptive statistics was employed mainly to carryout economy analysis in relation to macroeconomic variables of interest.

The data used were time series annual data on inflation, exchange rate and Sustainable Development Index of Nigeria covering 1997-2023. The secondary data used in this study were analyzed using regression analysis techniques to provide evidence of the impacts of inflation and exchange rate on sustainable development in Nigeria. Findings from the analyses were presented using tables.

4.1 Theoretical Model Used In The Study

In order to account for the behavior of inflation and sustainable development, this study employed Autoregressive Distributed Lag (ARDL) Model. ARDL models describe the relationships between multiple time series variables and is suitable for examining both the short-run and long-run effects of inflation and exchange rates on sustainable development.

ARDL Model:

$$\Delta SD_t = \alpha_0 + \alpha_1 \Delta INF_t + \beta_1 SD_{t-1} + \beta_2 INF_{t-1} + \epsilon_t$$

Where:

ΔSD_t = change in sustainable development at time t.

ΔINF_t = change in inflation at time t.

SD_{t-1} = lagged value of sustainable development.

INF_{t-1} = lagged value of inflation.

α_0, α_1 = short-run coefficients.

β_1, β_2 = long-run coefficients.

ϵ_t = error term.

The short-run coefficients (α_1) represent the immediate impact of changes in inflation and exchange rates on sustainable development, while the long-run coefficients (β_1, β_2) represent the equilibrium or steady-state relationship.

4.2 Validity and Reliability of Data

The study validated data using the Augmented Dickey-Fuller test (ADF) for stationarity, the Autoregressive Distributed Lag (ARDL) model for short-run variable correction, and Vector Error Correction modeling (VECM) to validate long-run relationships and cointegration vectors in non-stationary time series. The ARDL model is effective for analyzing multivariate time series and the study also employed Johansen's co-integration estimation to facilitate easier correction of serial correlation.

4.3 Empirical Model Specification of the Objective

Mathematical model that examines how inflation (INF) affects Sustainable Development Index (SDI) Growth (SDIG) as an indicator of sustainable development in Nigeria:

$$SDIG_t = \alpha + \beta INF_t + \epsilon_t$$

Where:

SDIG_t = the SDI growth rate in year t.

INF_t = the inflation rate in year t.

α = the intercept term.

β = coefficient that quantifies the impact of inflation on SDI growth.

ϵ_t = error term representing unexplained variation.

Model Interpretation:

β represents the elasticity of SDI with respect to inflation. If $\beta > 0$, it suggests that an increase in inflation leads to a proportional increase in SDI growth (which is generally not the case). If $\beta < 0$, it implies that an increase in inflation is associated with a decrease in SDI growth.

The error term ϵ_t captures the unobserved factors that affect SDI growth but are not included in the model.

If β is statistically significant and negative, it suggests that higher inflation is associated with lower SDI growth, which may be detrimental to sustainable development.

The magnitude of β quantifies the strength of the relationship. if $\beta = -0.2$, it means that a percentage increase in inflation is associated with a 0.2% decrease in SDI growth.

4.4 Sources of Data

The study utilizes the secondary method of data collection. It relied on written works from journal articles, working papers, and official documents. To capture the relationship between inflation and sustainable development, Sustainable Development Index is used as a proxy for sustainable development.

Specifically, data relating to inflation and sustainable development index were obtained from the CBN's Statistical Bulletin, World Bank and the National Bureau of Statistic's Annual Abstract of Statistics. The data covers the period from 1997 to 2023.

4.5 Presentation of Results**4.5.1 Descriptive Analysis**

Descriptive statistics presented in table 1 reflect the central tendencies, measure of dispersion, minimum and maximum values, degree of peakedness, asymmetric value, and the Jarque-bera statistics of all the variables used in the study. The analysis revealed the location of the center of distributions of the series via the average values (mean), the minimum values, maximum values as well as how individual variable values are spread on each side of the centre via the root mean squared deviation (standard deviation). The peakedness of each variable is given by the kurtosis

statistics, the symmetric nature given by skewness value while the normality status of each of the series is reflected by the Jarque-Bera statistics.

The table below reported average values of 0.528519, 203.9341, 3.636667, 309.9619 and 12.15481 for sustainable development indicator growth rate, exchange rate, foreign direct investment, gross domestic product and inflation rate respectively. The median values for sustainable development indicator growth rate, exchange rate, foreign direct investment, gross domestic product and inflation rate are 0.520000, 150.3000, 3.060000, 366.9900 and 12.090000 respectively. Maximum and minimum values for the period studied stood at 0.580000 and 0.480000; 758.7100 and 21.89000; 8.840000 and 0.300000; 574.1800 and 54.46000; 18.87000 and 5.390000 for sustainable development indicator growth rate, exchange rate, foreign direct investment, gross domestic product and inflation rate respectively, with standard deviation of 0.030723, 154.8952, 2.589253, 172.8692 and 3.864793 respectively.

The table also revealed that all the variables used in the study are positively skewed except for the value of GDP. Specifically, reported skewness statistics stood at 0.263777, 1.922033, 0.578690, -0.318749 and 0.203554 respectively. Kurtosis statistics revealed that all the variables used in the study are platykurtic by peakedness with reported statistics of 1.659377, 7.212871, 2.198172, 1.611614 and 2.145109 for sustainable development indicator growth rate, exchange rate, foreign direct investment, gross domestic product and inflation rate respectively. Jarque-bera statistics showed no evidence of rejection of normality for all the variables.

Table 1 Descriptive Statistics of Variables

	SDI	EXC_RA TE	FDI_ \$B_	GDP_ \$B_	INFLATI ON
Mean	0.528519	203.9341	3.636667	309.9619	12.15481
Median	0.520000	150.3000	3.060000	366.9900	12.09000
Maximum	0.580000	758.7100	8.840000	574.1800	18.87000
Minimum	0.480000	21.89000	0.300000	54.46000	5.390000
Std. Dev.	0.030723	154.8952	2.589253	172.8692	3.864793
Skewness	0.263777	1.922033	0.578690	-0.318749	0.203554
Kurtosis	1.659377	7.212871	2.198172	1.611614	2.145109
Jarque-Bera	2.335031	36.59077	2.230267	2.625771	1.008648
Probability	0.311139	0.000000	0.327872	0.269043	0.603914
Sum					
Sum Sq. Dev.	14.27000	5506.220	98.19000	8368.970	328.1800
Observations	0.024541	623805.9	174.3100	776977.9	388.3523

Source: Author's Computation (2023)

4.5.2 Correlation Analysis

Table 2 report the correlation coefficient of pairs of variables used in the study. Correlation coefficient reported showed positive correlation for sustainable development indicator and variables including inflation rate (0.0803), exchange rate (0.5368), foreign direct investment (0.1278) and gross domestic product (0.7386) respectively. Result also showed positive correlation for inflation and exchange rate (0.4387); exchange rate & foreign direct investment (0.1246),

exchange rate & GDP (0.7555) respectively.

Table 2: Correlation Matrix

	LN_SDI_	LN_EXR	LN_FDI_	LN_GDP_	LN_INF
		–			
LN_SDI_	1.0000	0.5368	0.1278	0.7386	0.0803
LN_EXR_	0.5368	1.0000	0.1246	0.7555	0.4387
LN_FDI_	0.1278	0.1246	1.0000	0.5314	0.0549
LN_GDP_	0.7387	0.7555	0.5314	1.0000	0.1690
LN_INF	0.0803	0.4387	0.0550	0.1691	1.0000

Source: *Author’s Computation (2023)*

4.5.3 Unit Root Test

Unit root test was carried out to ascertain the stationary property i.e. predictability properties of the variables. The presence of a unit root implies that the time series under investigation is non-stationary; while the absence of unit root shows that the series is stationary. Stationarity of any series implies that both the mean and variance are constant or equal to zero.

Before testing for unit root property, it is important to ascertain whether the coefficient of the constant and trend are statistically significant. This is done by regressing each variable on the constant and trend to determine if they are statistically significant.

4.5.3.1 Test of Significance of Constant and Trend

Before testing for unit root property, it is important to ascertain whether the coefficient of the constant and trend are statistically significant. This is done by regressing each variable on the constant and trend to determine if they are statistically significant. The results of these tests are presented in the tables below:

Table 3: Exchange Rate (EXR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.940370	0.133608	29.49192	0.0000
@TREND	0.086581	0.008816	9.820613	0.0000

Source: *Author’s Computation (2023)*

Decision: since the P-value of both trend and intercept are both less than 0.05, we reject the null hypothesis of no statistically significance and accept the alternative. This implies that both the trend and intercept will be considered when testing for presence of unit root in the variable.

Table 4: Foreign Direct Investment (FDI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.848413	0.971512	2.931937	0.0071
@TREND	0.060635	0.064106	0.945853	0.3533

Source: Author's Computation (2023)

Decision: only the P-value of the intercept is less than 0.05 i.e statistically significant while that of trend is not significant. We therefore consider only the intercept when testing for presence of unit root in the variable.

Table 5: Gross Domestic Product (GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.300714	0.139957	30.72872	0.0000
@TREND	0.091484	0.009235	9.905940	0.0000

Source: Author's Computation (2023)

Decision: since the P-value of both trend and intercept are both less than 0.05, we reject the null hypothesis of no statistically significance and accept the alternative. This implies that both the trend and intercept will be considered when testing for presence of unit root in the variable.

Table 6: Inflation Rate (Inf)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.254550	0.120701	18.67878	0.0000
@TREND	0.014664	0.007965	1.841182	0.0775

Source: Author's Computation (2023)

Decision: only the P-value of the intercept is less than 0.05 i.e statistically significant while that of trend is not significant. We therefore consider only the intercept when testing for presence of unit root in the variable.

Table 7: Sustainable Development Index (SDI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.491772	0.008015	61.35827	0.0000
@TREND	0.002827	0.000529	5.344720	0.0000

Source: Author's Computation (2023)

Decision: since the P-value of both trend and intercept are both less than 0.05, we reject the null hypothesis of no statistically significance and accept the alternative. This implies that both the trend and intercept will be considered when testing for presence of unit root in the variable

4.5.3.2 Unit root coefficients

The table 8 below shows the order of integration of each of the variables, which reflect the behavior of each of the variables when exposed to external shock. Unit root test employed in this study is the Augmented Dickey-Fuller (ADF) tests.

Test result showed that all the variables used in the study except inflation are not stationary at level, but after first differencing they became stationary, which implies that majority of the variables used in the study retain innovative shock passed on them only for a short period of time after which they let go. In a nutshell result showed that exchange rate, sustainable development indicator, foreign direct investment, GDP are integrated of order one I(1) i.e stationary after differencing at level one while inflation is integrated at order zero I(0) i.e stationary at level.

Table 8: Summary of Unit Root Test Result

Variables	ADF statistics	1% critical value	5% critical value	Order of integration
LN_SDI_	-4.289200	-4.394309	-3.612199	I(1)
LN_EXR_	-4.860143	-4.374307	-3.603202	I(1)
LN_FDI_	-5.266858	-3.724070	-2.986225	I(1)
LN_GDP_	-4.701096	-4.374307	-3.603202	I(1)
LN_INF	-3.377754	-3.724070	-2.986225	I(0)

Source: Author's Computation (2023)

4.5.4 Cointegration Test

Since variables are integrated at both order 0 and 1 respectively, we will perform an ARDL bound test for cointegrating relationship to check if they have a long run equilibrium relationship amongst themselves.

Table 9: F-bound Cointegration Test

ECM Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LN_SDI_(-1))	-0.870890	0.177981	-4.893164	0.0005
D(LN_SDI_(-2))	-0.934089	0.227882	-4.098994	0.0018
D(LN_EXR_)	-0.105986	0.035641	-2.973743	0.0127
D(LN_EXR_(-1))	0.040907	0.014049	2.911796	0.0141
D(LN_GDP_)	0.070401	0.025764	2.732547	0.0195
D(LN_GDP_(-1))	0.119614	0.026291	4.549559	0.0008
D(LN_INF_)	0.038516	0.010933	3.523093	0.0048
D(LN_INF_(-1))	0.038270	0.012076	3.169052	0.0089
CointEq(-1)*	-0.082123	0.006376	-5.038310	0.0004

Source: Author's Computation (2023)

R-square=0.720976, Adjusted R-square=0.572163, Durbin-Watson=1.886612

The table above is the shortrun ARDL result. To have a statistically significant model, the coefficient of the error correction term CointEq(-1)*, must be negative and less than 1 (-0.082123) and statistically significant (0.0004). I.e if we multiply the value (-0.082123) by 100 we have 82% which shows high speed of adjustment from the shortrun to the longrun if there is any disequilibrium in the system.

The R square value of 0.72 also show that the model is a good fit.

Table 10: F-bound Test

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.723070	10%	1.9	3.01
k	4	5%	2.26	3.48
		2.5%	2.62	3.9

		1%	3.07	4.44
t-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-5.038310	10%	-1.62	-3.26
		5%	-1.95	-3.6
		2.5%	-2.24	-3.89
		1%	-2.58	-4.23

Source: Author's Computation (2023)

From the F-bound table above, it was observed that the F value 3.72 is greater than the lower bound at 5% 2.26 and upper bound at 5% 3.48, showing that there is a long run equilibrium relationship between the dependent variable and independent variables. This means that the model passed the cointegration test.

4.5.5 To Examine the Longrun Form of the Model

Table 11: Longrun Form of the Model

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_SDI_(-1)*	-0.032123	0.449311	-0.071493	0.9443
LN_EXR_(-1)	-0.080488	0.033361	-2.412617	0.0345
LN_FDI_**	-0.008846	0.003153	-2.805901	0.0171
LN_GDP_(-1)	0.076196	0.021717	3.508643	0.0049
LN_INF_(-1)	0.012251	0.031480	0.389150	0.7046
D(LN_SDI_(-1))	-0.870890	0.578050	-1.506601	0.1601
D(LN_SDI_(-2))	-0.934089	0.726321	-1.286055	0.2248
D(LN_EXR_)	-0.105986	0.077365	-1.369954	0.1980
D(LN_EXR_(-1))	0.040907	0.028515	1.434592	0.1792
D(LN_GDP_)	0.070401	0.045965	1.531618	0.1539
D(LN_GDP_(-1))	0.119614	0.046497	2.572519	0.0259
D(LN_INF_)	0.038516	0.026761	1.439260	0.1779
D(LN_INF_(-1))	0.038270	0.021335	1.793785	0.1004

Source: Author's Computation (2023)

Table 12: Longrun Form of the Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_EXR_	-2.505669	35.79984	-0.069991	0.9455
LN_FDI_	-0.275377	3.817541	-0.072135	0.9438
LN_GDP_	2.372048	32.80597	0.072305	0.9437
LN_INF_	0.381371	4.788268	0.079647	0.9379

Source: Author's Computation (2023)

$$EC = LN_SDI_ - (-2.5057*LN_EXR_ -0.2754*LN_FDI_ + 2.3720*LN_GDP_ + 0.3814*LN_INF$$

Table 13: Longrun Form of the Model

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.723070	10%	1.9	3.01
k	4	5%	2.26	3.48
		2.5%	2.62	3.9
		1%	3.07	4.44
t-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-0.071493	10%	-1.62	-3.26
		5%	-1.95	-3.6
		2.5%	-2.24	-3.89
		1%	-2.58	-4.23

Source: *Author’s Computation (2023)*

Summary: From the F-bound table above, it was observed that the F value 3.72 is greater than the lower bound at 5% 2.26 and upper bound at 5% 3.48. showing that there is a long run equilibrium relationship between the dependent variable and independent variables. This means that the model passed the cointegration test

4.5.6 Overparameterized ARDL ECM Result

After establishing that long run relationship existed between the dependent variable and the independent variables through Johansen co-integration estimation of the normalized co-integration equation, Error Correction modeling (ECM) was also carried out, using Autoregressive Distributed Lags (ARDL) techniques, in order to validate the presence of such long run relationship and examine the speed at which the short run inconsistencies/discrepancies were corrected and incorporated into the long run equilibrium dynamics. An over-parameterized error correction model (ECM) was estimated to allow for the identification of the main dynamic pattern of the model and ensure that the dynamics of the model have not been constrained by a too short lag length after which a parsimonious error correction model was generated by eliminating the less significant variables from the over-parameterized model. Thus the parsimonious estimation result is presented in table 18 below.

Table 14: Overparameterized ARDL ECM Table

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_SDI_(-1)	0.096987	0.232958	0.416329	0.6852
LN_SDI_(-2)	-0.063199	0.335424	-0.188414	0.8540
LN_SDI_(-3)	0.934089	0.726321	1.286055	0.2248
LN_EXR_	-0.105986	0.077365	-1.369954	0.1980

LN_EXR_(-1)	0.066405	0.110901	0.598777	0.5614
LN_EXR_(-2)	-0.040907	0.028515	-1.434592	0.1792
LN_FDI_	-0.008846	0.003153	-2.805901	0.0171
LN_GDP_	0.070401	0.045965	1.531618	0.1539
LN_GDP_(-1)	0.125408	0.075189	1.667904	0.1235
LN_GDP_(-2)	-0.119614	0.046497	-2.572519	0.0259
LN_INF_	0.038516	0.026761	1.439260	0.1779
LN_INF_(-1)	0.012004	0.015507	0.774114	0.4552
LN_INF_(-2)	-0.038270	0.021335	-1.793785	0.1004

Source: Author's Computation (2023)

R-square = 0.860035, Adjusted R-square = 0.707345, Durbin-Watson = 1.886612

Out of the 13 coefficients 11 are not significant which is about 85% this is way too high so we have to subject it to the wald test.

Table 15: Wald Test

Test Statistic	Value	df	Probability
F-statistic	2.666705	(10, 11)	0.0615
Chi-square	26.66705	10	0.0029

Source: Author's Computation (2023)

Since the probability is greater than 0.05 we cannot reject the null hypothesis that the coefficients are =0 we then remove the variables whose coefficients that are =0 to get a parsimonious model.

4.5.7 Persimonous ECM

Table 16: Persimonous ECM Table

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LN_SDI_(-3)	1.149773	0.185623	6.194121	0.0000
LN_EXR_	-0.063186	0.017611	-3.587780	0.0027
LN_EXR_(-2)	-0.028464	0.014724	-1.933156	0.0723
LN_FDI_	-0.008618	0.002386	-3.611687	0.0026
LN_GDP_	0.096710	0.031324	3.087400	0.0075
LN_GDP_(-1)	0.085910	0.036419	2.358969	0.0323
LN_GDP_(-2)	-0.109279	0.029840	-3.662104	0.0023
LN_INF_	0.032381	0.015964	2.028433	0.0507
LN_INF_(-2)	-0.030986	0.014466	-2.142054	0.0490

R-square = 0.848883, Adjusted R-square = 0.768288, Durbin-Watson = 1.736354

Source: Author's Computation (2023)

Most of the coefficients are statistically significant.

4.5.8 Heteroscedascity Test

H0: residuals are homoscedastic

H1: residuals are not homoscedastic

Table 17: Breusch-Pagan-Godfrey Heteroscedasticity Test

F-statistic	0.847807	Prob. F(13,10)	0.6174
Obs*R-squared	12.58312	Prob. Chi-Square(13)	0.4805
Scaled explained SS	4.822853	Prob. Chi-Square(13)	0.9789

Source: Author's Computation (2023)

Decision: as P-value is 0.4805 greater than 5% significant level, we accept the Ho which means that residuals are not heteroskedasticity. I.e there is no heteroskedasticity which means that the OLS estimators are the best linear unbiased estimators with low standard errors.

4.5.9 Multicollinearity

Multicollinearity exist when at least some of the predictor variables are correlated amongst themselves. The consequence of multicollinear variables is that the ordinary least square estimators have large variance and covariance thereby making precise estimation difficult to come by. It also sometimes make hitherto significant variable insignificant by increasing the standard error.

Table 18: Multicollinearity

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.001204	94.12376	NA
LN_EXR_	8.82E-05	180.8702	3.947868
LN_FDI_	3.70E-06	5.699724	1.869645
LN_GDP_	9.18E-05	220.8541	4.571687
LN_INF_	0.000158	75.26926	1.350733

Source: Author's Computation (2023)

Decision: Since the result for centred VIF are less than 10 it means there is no multicollinearity.

Table 19: Post Estimation Test

Linearity Test		
Statistics	Values	Probability
T-statistic		
F-statistic		
Normality Test		
Statistics	Values	Probability
Jarque-Bera Stat		
Serial Correlation LM Test		
Statistics	Values	Probability
F-statistic		
Heteroscedasticity Test		
Statistics	Values	Probability
F-statistic		

Source: Author's Computation (2023)

HYPOTHESIS

H0: Inflation has a no significant negative impact on sustainable development in Nigeria.

H1: Inflation has a significant negative impact on sustainable development in Nigeria

Decision: Reject H0; Accept H1

H0: Exchange rate has a no significant negative impact on sustainable development in Nigeria.

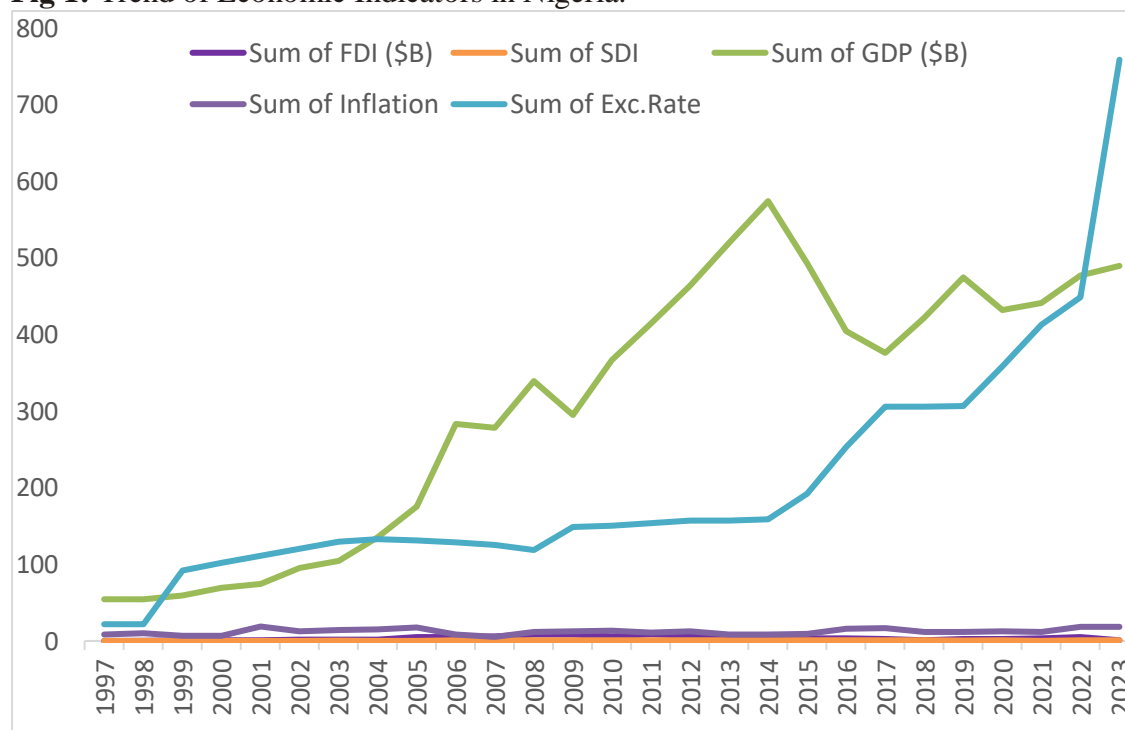
H1: Exchange rate has a significant negative impact on sustainable development in Nigeria

Decision: Reject H0; Accept H1

5. CURRENCY RESTRUCTURING POLICIES AND SDGs PROGRESS IN NIGERIA

The Central Bank of Nigeria (CBN) is charged with the responsibility of ensuring stability in general price level and exchange rate. However, this study evaluates the effect of currency restructuring policies of CBN on sustainability of the Nigerian economy.

Fig 1: Trend of Economic Indicators in Nigeria.



Source: Author's computation (2023)

The graph above represent various economic indicators for Nigeria from 1997 to 2023, providing a historical perspective on economic trends. The exchange rate seem to be fluctuating over the years, indicating changes in the currency's strength against other currencies.

In other words, Nigerian naira largely experienced depreciation and devaluation relative to US dollar in the selected years. The above findings are not surprising as Nigeria is a highly import-dependent economy, despite the abundance of resources in Nigeria. Moreover, the United States accounts for the largest buyer of Nigeria's exports. Hence, demand for foreign currency compared to the naira continues to edge upwards. Thus, the observed upbeat trend in ₦/\$ exchange rate raises doubts as regards the effectiveness of CBN exchange rate policies.

The inflation rate reflects the percentage change in the general price level of goods and services.

It's evident that Nigeria experienced fluctuations in inflation, with some years showing higher rates than others. The Sustainable Development Index is a measure of social development. It appears relatively stable over the years, with minor fluctuations.

The Gross Domestic Product measures the total value of goods and services produced by a country. The values are in billions of dollars, and there is a clear upward trend, indicating economic development over the years.

The Foreign Direct Investment represents the amount of foreign direct investment in Nigeria. Like GDP, there's a noticeable increase over the years, suggesting that foreign investors are showing interest in the Nigerian market.

6. CHALLENGES AND PROSPECTS OF INFLATION ON NIGERIA'S SUSTAINABLE DEVELOPMENT AGENDA

A country's total economic performance and progress are significantly impacted by inflation, a crucial macroeconomic issue. Inflation has been a persistent issue that hinders the achievement of sustainable development goals in Nigeria, as it has in many other developing countries.

The impact of inflation on sustainable development in Nigeria is significant and multifaceted. Inflation, defined as a persistent increase in the general price level of goods and services over time, affects various dimensions of sustainable development in the country.

6.1 Challenges

1. **Purchasing Power Erosion:** Inflation reduces the purchasing power of consumers and households. As the prices of goods and services rise, individuals find it more challenging to afford essential items like food, healthcare, and education. This can lead to a decline in the standard of living, particularly for low and middle-income groups. The erosion of purchasing power can hinder access to basic needs, which is a fundamental component of human development.

2. **Income Redistribution:** Inflation can lead to income redistribution, often favoring those with assets and investments that appreciate with inflation. People who have access to financial assets like real estate, stocks, or bonds may benefit from inflation, as the value of these assets tends to rise. On the other hand, those who rely on fixed incomes, such as pensions or government subsidies, may see their real income diminish in an inflationary environment. This income inequality can hinder equitable and inclusive growth, which is a core element of sustainable development.

3. **Uncertainty and Economic Stability:** High and volatile inflation rates can create economic instability. Businesses struggle to plan and make long-term investments in such an environment, and foreign investors may be deterred from participating in the Nigerian economy. Economic instability, in turn, can impede the country's ability to sustain robust economic growth, which is essential for achieving sustainable development goals.

4. **Resource Misallocation:** Inflation can distort resource allocation in an economy. Scarce resources may be misallocated as a result of price distortions, leading to inefficiencies in production and consumption. This can hinder the efficient utilization of resources and undermine sustainable development efforts, as resources may not be directed towards sectors and projects that promote long-term development.

5. **Policy Trade-offs:** To combat inflation, policymakers may resort to contractionary monetary policies, such as raising interest rates or reducing government spending. While these measures

may help control inflation, they can also slow down economic growth. Policymakers often face a trade-off between controlling inflation and promoting economic development. Striking the right balance is essential to ensure sustainable development.

6. Investor Confidence: High and unpredictable inflation rates can erode investor confidence. Both domestic and foreign investors may be reluctant to commit to long-term projects and investments, fearing that their returns will be eroded by rising prices. This can hinder the flow of capital into key sectors that drive sustainable development.

7. Environmental Impact: Inflation can indirectly impact environmental sustainability. Economic instability and resource misallocation can lead to unsustainable practices in sectors like agriculture, natural resource extraction, and energy production, which can have adverse environmental consequences. Sustainable development includes environmental sustainability as one of its core pillars.

In summary, inflation in Nigeria has the potential to undermine various aspects of the country's sustainable development agenda. While moderate inflation can be a sign of a growing economy, high and volatile inflation rates pose a substantial risk to economic stability, income equality, and resource allocation. Effective management of inflation is crucial to achieving Nigeria's sustainable development goals, and policymakers must strike a balance between controlling inflation and promoting long-term economic, social, and environmental sustainability.

6.2 Prospects

1. Moderate Inflation: Moderate inflation within a target range can have some positive prospects. It can indicate a growing and dynamic economy and promote spending and investment, which can support economic development efforts.

2. Incentives for Investment: Inflation may provide incentives for individuals and businesses to invest in assets that appreciate with rising prices, such as real estate or stocks. This can promote wealth creation and investment in the economy.

3. Awareness and Policy Response: Inflation challenges can raise awareness among policymakers, encouraging them to adopt measures to stabilize prices and promote a conducive economic environment. This, in turn, can help maintain macroeconomic stability, a critical factor for sustainable development.

In summary, the challenges and prospects of inflation in Nigeria have complex implications for the country's sustainable development agenda. While moderate inflation can indicate a growing economy and encourage investment, high or volatile inflation poses significant challenges, such as eroding purchasing power and income inequality. To effectively navigate the impact of inflation on sustainable development, Nigerian policymakers must adopt measures that strike a balance between controlling inflation and promoting long-term economic, social, and environmental sustainability.

7. POLICY RECOMMENDATION

Based on the findings of the research on the challenges and prospects of inflation on Nigeria's Sustainable Development Agenda, the following policy recommendations are suggested to help address the challenges posed by inflation and promote sustainable development in the country:

1. Inflation Targeting and Monetary Policy: The Central Bank of Nigeria should continue to employ inflation-targeting measures to maintain price stability. It is crucial to set clear and achievable inflation targets to prevent excessively high inflation rates. Implement prudent monetary policies that take into account the dual objectives of controlling inflation and promoting sustainable economic growth.

2. Fiscal Discipline: The Nigerian government should exercise fiscal discipline by ensuring responsible and transparent public financial management. This includes reducing budget deficits and managing public debt effectively to avoid inflationary pressures. Also, it is important to prioritize the allocation of resources to sectors that directly contribute to sustainable development, such as education, healthcare, and infrastructure.

3. Productivity and Supply-Side Reforms: The Nigerian government should invest in policies and reforms that enhance productivity in key sectors of the economy, such as agriculture and manufacturing. This is because higher productivity can help reduce supply-side constraints that contribute to inflation.

Moreover, structural issues, including infrastructure deficiencies and regulatory barriers, that hinder economic efficiency and contribute to inflationary pressures should be addressed.

4. Inclusive Growth and Poverty Alleviation: The government should develop and implement targeted social safety net programs to protect vulnerable populations from the adverse effects of inflation. These programs can include cash transfer schemes, food security initiatives, and healthcare subsidies.

Also, inclusive economic growth should be promoted by supporting small and medium-sized enterprises (SMEs) and encouraging entrepreneurship, which can create jobs and alleviate poverty.

5. Environmental Sustainability: The government should integrate environmental sustainability considerations into economic and development policies. It should strive to reduce the environmental impact of economic activities while ensuring that sustainable development goals are met.

6. Data and Research: The government should invest in the collection, analysis, and dissemination of economic and development data to enhance the evidence-based decision-making process. Regular assessments of the relationship between inflation and sustainable development should be conducted to inform policy adjustments.

7. Capacity Building and Education: The Nigerian government should strengthen the capacity of government agencies, policymakers, and institutions to design and implement effective policies aimed at addressing inflation and promoting sustainable development. There should be investment in financial literacy and economic education programs for the general population to increase understanding of economic issues, including inflation.

8. Private Sector Development: The government should encourage private sector growth and investment by creating a conducive business environment. This includes reducing bureaucratic red tape, improving the ease of doing business, and providing incentives for private sector participation in sustainable development projects.

9. International Collaboration: The government should collaborate with international organizations and partners to access technical expertise, financial support, and knowledge sharing in managing inflation and advancing sustainable development initiatives.

10. Regular Policy Review: The government should establish a mechanism for regular policy reviews to assess the effectiveness of measures taken to address inflation and its impact on

sustainable development. Policies should be adjusted as needed to adapt to changing economic conditions.

These policy recommendations, when implemented collectively and systematically, can help Nigeria strike a balance between controlling inflation and advancing its sustainable development agenda, ultimately improving the well-being of its citizens and promoting long-term economic and social progress.

8. CONCLUSION

This research highlights the complex relationship between inflation and Nigeria's sustainable development agenda. It reveals that inflation can negatively impact living standards, disrupt macroeconomic stability, and hinder resource allocation. The study emphasizes the importance of sound monetary and fiscal policies to stabilize prices and promote economic growth.

Addressing inflation is not only about economic stability but also a crucial step towards achieving Nigeria's broader development objectives. Nigerian policymakers must adopt a comprehensive approach to managing inflation, focusing on prudent monetary policies, fiscal discipline, and enhancing economic resilience.

Addressing structural issues and aligning inflation-targeting strategies with sustainable development objectives, such as inclusive growth, poverty reduction, and environmental sustainability, can help Nigeria navigate inflation challenges and achieve its sustainable development goals.

This research highlights the significant role of inflation in Nigeria's sustainable development agenda, urging policymakers, economists, and stakeholders to incorporate strategies to mitigate its effects into the nation's development policy framework.

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