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INFLATION AND SUSTAINABLE DEVELOPMENT GOALS (SDG) IN NIGERIA

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Abstract
This study examined the impact of inflation on sustainable development goals in Nigeria. The specific objectives of this study were to examine the impact of inflation, interest rates, and exchange rates on SDGs in Nigeria from 2000 to 2023. Annual time series data on the Human Development Index (HDI), Inflation rate (INF), exchange rate (EXT), and interest rate (INT) were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, 2023 and National Bureau of Statistics (NBS) Publications for the year 2023. The Human Development Index (which was used as proxy to sustainable development goals) served as the dependent variable. The independent or explanatory variables of the study were INF, EXT, and INT. The study used the Autoregressive Distributive Lag (ARDL) econometric technique to achieve all the objectives, and the findings showed that inflation had the expected negative and significant impact on SDGs in the economy within the study period. Although interest rates had the expected inverse relationship with HDI, it was statistically insignificant. Furthermore, exchange rate had the unexpected direction of relationship with SDGs and was not statistically significant in influencing SDGs within the study period. Based on these findings, this study concludes that the inflation rate has the potential to adversely affect the attainment of the SDGs in Nigeria. Therefore, the study recommends that governments and policymakers take steps toward achieving price stability in the economy. The government and monetary authorities should equally ensure that interest rates positively impact SDGs by providing development funds available to concerned stakeholders at a subsidized rate of interest. This can take the form of concessions and establishing a special credit window for these crucial goals. Moreover, decreasing interest rates to stimulate domestic progress on the attainment of the SDGs will go a long way to increase the variety of domestic goods, which in the longrun is capable of generally lowering inflationary pressures in the economy.

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1.1 Introduction

Inflation is a situation where there is an increase in the price of an item in a country that runs continuously because of market mechanisms that result from certain factors (Yunita, 2018). According to Sama (2018), inflation can be caused by export receipts in a country that is considered inelastic and the country's economic problems. Continuous inflation in a country will have a significant impact, increasing the cost of living, leading to poverty. Inflation is influenced by the amount of interest rates applied by the central bank of a country, the exchange rate of the domestic economy, money circulating in a country, and the amount of production and demand made by the community, causing rises and falls in the prices of goods and services (Coibion, 2019). If a country has inflationary conditions, the interest rates set for banks that impact changes in goods prices and the economic growth of the society as a whole. Consequently, government decisions through the central bank are indispensable in regulating a country's inflation rate through monetary policy (Sama, 2018). Furthermore, changes in exchange rates can affect the price changes associated with a product to be higher than before, especially when the product is imported or the inputs for its production are imported. The indicator used to measure a country's inflation rate is the Consumer Price Index (CPI). Changes in the CPI over a certain period indicate consumer goods in society (Yunita, 2018). The CPI is used in a survey to determine the cost of living in a country, which will be monitored by the Central Statistics Agency, which will then be monitored for a certain period to determine the impact of changes in the CPI in a country.

The UN (1987) conceives sustainable development as development that seeks economic advancement and progress that takes cognizance of protecting the long-term value of the environment. This presupposes that advancement in the way people live their lives should not cause daunting challenges to their health and environment. It is an inter-generational equality with the idea that all resources, such as economic, environmental, or social, should be used and distributed fairly across generations (OECD, 2008). Development meets the needs of the present without compromising the ability of future generations (OECD, 2008). The overall goal of sustainable development is the long-term stability of the economy and environment, which is achievable through the integration and acknowledgment of economic, environmental, and social concerns throughout the decision-making process (Emas, 2015).

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a set of objectives within a universal agreement to end poverty, protect all that makes the planet habitable, and ensure that all people enjoy peace and prosperity, now and in the future (UN, 2022). The Goals were adopted by all member states of the United Nations formally in 2015 for the period 2016–2030 to address the overwhelming empirical and scientific evidence that the world needs a radically more sustainable approach. The goals provide a well-consulted framework that is scientifically robust, politically acceptable, and publicly intuitive. The goals provide us with the best chance of ensuring the necessary collaboration and alignment as we implement global approaches to securing a fair, healthy, and prosperous future for ourselves, our children, and grandchildren.

The Sustainable Development Goals (adopted by the United Nations General Assembly in September 2015) run from 2016 to 2030 and are formally the goals of the United Nations' 'Transforming our world; the 2030 Agenda for Sustainable Development'. The practical and political importance of SDGs and the challenges associated with them can only be truly appreciated by understanding what preceded them. The Millennium Development Goals (MDGs) were in place from 2000 to 2015 and consist of eight international development goals. These eight MDGs were supported by 21 individual targets. The MDGs, although a move in the right direction, were subject to certain criticisms. One issue is that there was insufficient analysis to justify why these goals were selected as priorities and insufficient information available to enable performance comparison, especially in

tackling inequalities within countries. The seventeen (17) Sustainable development goals proposed for achievement demand nothing short of the guarantee of human rights for all and sundry, achievable through a transformation of the economic and political systems that govern our present-day ever dynamics societies. These 17 goals are; No Poverty (Goal 1), Zero Hunger (Goal 2), Good Health and Well-being (Goal 3), Quality Education (Goal 4), Gender Equality (Goal 5), Clean Water and Sanitation (Goal 6), Climate Action (Goal 13), Life below Water (Goal 14), Life on Land (Goal 15), Affordable Clean Energy (Goal 7), Decent Work and Economic Development (Goal 8), Industry, Innovation and Infrastructure (Goal 9), Reduce Inequalities (Goal 10), Sustainable Cities and Communities (Goal 11), Responsible consumption and production (Goal 12), Peace, Justice and Strong Institutions (Goal 16) and Partnerships for the Goals (Goal 17).

Inflation is a problem and an economic menace that adversely affects every sector and aspect of the economy by causing individuals, businesses, and the government to pay higher prices for goods and services that should be cheaper. Inflationary situations cause a decline in the purchasing power of money and consequently reduce people's disposable income. To understand how problematic inflation could be for SDGs, it is imperative to first understand how it occurs. Inflation usually arises from either a rise in the cost of raw materials necessary for the production of goods (Cost-push inflation) or an increase in demand for goods on the market (Demand-pull inflation). In recent times, there has been a heightened debate surrounding the rise in the inflation rate, amid rising fuel pump prices, food prices, and the high cost of living. In terms of attaining sustainable development goals, a drop in inflation is expected to assist development experts and policymakers in planning for production and also encourage more investments in achieving set goals, while a rise in inflation rate is expected to raise production costs as well as distort future plans and forecasts. In this regard, understanding how past inflation figures and patterns have influenced or impacted the process and achievement of sustainable development goals overtime remains a basic problem that requires urgent attention. Hence, this study is validated on the premise that it examines the impact of inflation on the attainment of sustainable development goals (SDGs) in Nigeria.

1.2 Statement of the Problem

Several recent research have shown that inflation has disrupted millions of people's ways of life and sources of income, especially the formal sector business operators and family households' income globally, and several efforts being put in place by national governments of different countries have not yielded the expected results (Adeboye et al., 2022). According to Arora and Mishra (2019), several of the 169 targets set by SDGs for achievement in the year 2020 remains unachieved as at the moment, hence anticipating an ambitious-like posture for the 2030 agenda. The year 2021 should ordinarily mark the vigorous commencement of the decade of action to deliver the SDGs by 2030, but the ever-changing economic situations compounded by the ravaging global inflationary pressures have been largely attributed to the uncertainty that prevails in its realization at the targeted date. To further compound the existing quagmire, the recent Russia-Ukraine war adversely affected global production and supply of vital food and commodity items. This has obviously boosted the prices of basic and vital supplies all over the globe. Consequently, the United Nations' ability to attain the SDGs has been thwarted not only globally but also in the Nigerian environment and context.

Goals 1, 2, 8, 9, and 12 border respectively on "No poverty, zero hunger, decent work and economic growth, industry innovation and infrastructure, responsible consumption and production" are directly related to economic and price stability around the globe in general and the Nigerian environment in particular. The realization of these goals has become more of mirage with the continuous presence of a high inflation rate. The SDGs (2020) report that over 71 million people are already pushed into poverty, and approximately 25.9% of

the world population is affected by severe food insecurity. Small-scale producers comprising between 40% - 85% of all food producers in developing countries are the worst hit by the inflation plague, thus creating additional threat to food availability. According to Barron (2020), capital markets declined beyond 30% as at March 2020, which implied that the volatilities of equities have spiked to crisis levels and credit spreads on non-investment grade debt have widened sharply as investors attempt to reduce risks due to adverse inflationary effects. The interim economic outlook highlighted by NBS (2023) emphasized that inflation had already worsened Nigerian economic growth, and subsequent unforeseen and unpredictable economic futures had eroded prospects for investments in economic growth. Hitherto, the government introduced measures to contain the situation. Although it is of necessity to contain the inflationary situation, it is noteworthy that the measures introduced by the new administration have led to both a socio and economic quagmire in the economy as a whole. As a result, recent statistics have indicated business failures and shutdowns in Nigeria, where development indices have experienced continuous negative trend with inflationary rate currently at double digits.

The goals 4 and 5, which border, respectively, on ensuring inclusive and equitable quality education as well as achievement of gender equality, are directly related to the population of young boys and girls within the economy. The advent of inflation brought to almost a dead end, the discharge of quality education around the globe. This is because access to quality education is exclusive to those with the financial capability to pay tuition and other fees, which are ordinarily beyond the reach of the vast majority of people in the Nigerian environment. This is based on the recent endemic increase in fees and tuition at all stages of educational institutions across the country. From the foregoing, it is obvious that the recent spike in inflation clearly has weakened the resolve to achieve education for all children by 2030. Before the current price hike, progress in education was already too slow to achieve the goal of inclusive and equitable quality education and promote lifelong learning opportunities for all. Almost nine years into the SDG's duration, many children of school age are still not enrolled. The children of the poor are bearing the brunt of the inflation crisis, if nothing tangible is done to mitigate the situation. Due to the general economic hardship associated with inflationary situations, many pupils/children drop out and never return to school; some are forced into child marriage or child labour. According to SDGs (2011) reports, only 59 per cent of grade three children in 2019 were proficient in reading, while the current inflationary trend is projected to cause an additional 51 million children to fall below the minimum reading proficiency threshold, increasing the total number of students falling behind to 84 million in 2020 (Adeboye et al, 2022). This wipes out the progress achieved in education over the past 20 years in Nigeria.

Another important associated issue is the factors responsible for the unstable or fluctuating nature of inflation figures or rate overtime in the Nigerian environment. As previously highlighted, inflation in Nigeria is currently influenced by the amount of interest rates applied by the central bank of the country, thereby causing the rise and fall of the price of goods and services (Coibion, 2019). If a country has inflationary conditions, the interest rates set for banks that impact changes in goods prices and the economic growth of the society as a whole. Consequently, government decisions through the central bank are indispensable in regulating a country's inflation rate through monetary policy, which in turn affects the attainment of the SDGs. Furthermore, the SDGs have been grappling with a surge in production costs, mostly emanating from instabilities in the Naira/Dollar exchange rate, disruptions in global supply chains brought about by the emergence of Covid-19 (characterized by local close downs of borders and a slowdown of trade between countries), as well as changes in weather patterns, among other things. These factors have increased raw material prices in both domestic and international markets, resulting in a rise in the cost of production for local manufacturers. The cost push was

reflected in the prices of commodities in the domestic market that equally rose. Additionally, there was a devaluation in the performance of the Naira against the US dollar from around N617/US$ on 29th June, 2022 to about N916/US$ on 31st October, 2022 (Odey and Ushie, 2022). The current Naira/Dollar exchange rate currently (as at June, 2024) stands at N1488/US$. Due to this devaluation, the inflation rate for the period between August 2022 and June 2024 skyrocketed, with domestic food prices as well as the cost of living still remaining very high. This is due to the poor performance of other factors; among them being the import-dependent nature of the Nigerian economy for most finished goods and raw materials. When the domestic currency appreciates, for instance, policymakers benefit from appreciating Naira because it becomes relatively easier and cheaper to plan and expend for policy implementations. The poor exchange rate condition suggests that higher inflation is typically more present in emerging economies like Nigeria, thereby mitigating or reducing the attainment of SDGs. From the foregoing, this study is validated on the ground that it examines the link between inflation and SDGs in Nigeria.

1.3 Research Questions

The following research questions were used in this study:

i. What is the impact of inflation on Sustainable Development Goals (SDGs) in Nigeria?

ii. Does the interest rate impact the Sustainable Development Goals in Nigeria?

iii. Does the exchange rate have an impact on Sustainable Development Goals (SDGs) in Nigeria?

1.4 Objectives of the Study

The broad objective of this study was to examine the impact of inflation on Sustainable Development Goals (SDGs) in Nigeria. The specific objectives are as follows:

i. To examine the impact of inflation on Sustainable Development Goals in Nigeria.

ii. To investigate the impact of interest rate on Sustainable Development Goals in Nigeria

iii. To determine the impact of exchange rates on Sustainable Development Goals (SDGs) in Nigeria

1.5 Study scope

This study examined the impact of inflation on Sustainable Development Goals in Nigeria within the period spanning 2000-2023. The reason for the choice of the base year of 2000 is because the Sustainable Development Goals (SDGs) are a relatively recent initiative of the United Nations, which was established in 2015. The terminal year of 2023 was chosen due to data availability, thus giving a study duration of 24 years, which is very recent and long enough to generate a significant statistical result or outcome. This study explores regression analysis (using an advanced technique) to achieve the objectives. The data used in this study were secondary time series data sourced from the Central Bank of Nigeria Statistical Bulletin for 2023 and the 2023 publication of the National Bureau of Statistics (NBS).

2.1 Literature Review

2.2 Inflation

According to Madura (2007), inflation is generally an increase in the price level of goods and services over a certain time. The inflation rate can be estimated by measuring the percentage change in the consumer price index, which indicates the price of many consumer products. Factors that can cause inflation include costs and demand. A situation in which higher prices are imposed by companies because of higher production costs is called *cost-push inflation*. Conversely, a situation in which prices of products and services increase due to strong consumer demand that is greater than the supply is called *demand pull inflation.* Continuous inflation in a country will have a significant impact, increasing the cost of living, leading to poverty.

Madura (2007) also explained that inflation consists of 4 types, such as

 Creeping inflation is an easy-to-control phenomenon that has not disrupted a country's economy. That is an increase in the prices of goods/services in general, which is less than 10% per year and can be controlled.
 Walking inflation is an inflation that can reduce the level of prosperity of the middle-income people, but it does not endanger the economic activities of a country. This inflation is in the range of 10% - 30% per year.
 Galloping inflation is an inflation which results in economic chaos in a country. In this condition, people generally prefer to save goods instead of money because the interest from saving money is much lower than the inflation value. This inflation ranges from 30% to 100% per year.
 Hyperinflation is an inflation problem that has affected a country's economy and is very difficult to control despite monetary and fiscal policies. This inflation is in the range of 100% to above per year**.**

2.3 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a set of objectives within a universal agreement to end poverty, protect all that makes the planet habitable, and ensure that all people enjoy peace and prosperity, now and in the future (UN, 2022). The Goals were adopted by all member states of the United Nations formally in 2015 for the period 2016–2030 to address the overwhelming empirical and scientific evidence that the world needs a radically more sustainable approach. The goals provide a well-consulted framework that is scientifically robust, politically acceptable, and publicly intuitive. The goals provide us with the best chance of ensuring the necessary collaboration and alignment as we implement global approaches to securing a fair, healthy, and prosperous future for ourselves, our children, and grandchildren.

According to NBS (2017), the SDG agenda 2030 is formed into 17 different goals, as stated below:

(i) End poverty in all its forms
(ii) End hunger, achieve food security and improved nutrition and promote sustainable agriculture
(iii) Ensuring healthy lives and promoting well-being for all at all ages
(iv) Ensuring inclusive and equitable quality education and promoting life-long learning opportunities for all
(v) Ensuring gender equality everywhere
(vi) Ensuring the availability and sustainable management of water and sanitation
(vii) Ensuring access to affordable, reliable, sustainable, and modern energy for all
(viii) Promote sustained, inclusive, and sustainable economic growth, full and production employment, and decent work for all.
(ix) Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
(x) Efforts to reduce inequality within and among countries
(xi) Making cities and human settlements inclusive, safe, resilient, and sustainable
(xii) Ensuring sustainable consumption and production patterns
(xiii) Urgent action to combat climate change and its impacts
(xiv) The sustainable use of oceans, seas, and marine resources for sustainable development
(xv) Protect, restore, and promote the sustainable use of terrestrial ecosystems; sustainably manage forests; combat desertification; and halt and reserve land degradation and biodiversity loss
(xvi) Promote peaceful and inclusive societies and sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
(xvii) Strengthen implementation means and revitalize global partnerships for sustainable development.

2.4 Theoretical Framework

The theory of cost-push inflation became popular during and after the Second World War. This theory maintains that prices, instead of being pulled-up by excess demand, are also pushed-up because of a rise in the

cost of production. Under cost-push inflation, prices rise because of a rise in the cost of raw materials, especially wages. The theory holds that the basic explanation for inflation is the fact that some producers, group of workers, or both succeed in raising the prices for either their product or services above the levels that would prevail under more competitive conditions. In other words, inflationary pressures originate from supply rather than demand and spread throughout the economy. Inflation of the cost-push type originates in industries that are relatively concentrated and in which sellers can exercise considerable discretion in the formulation of both prices and wages. Cost-push inflation may not be possible in an economy characterized by pure competition.

It is pertinent to note that the arguments of the cost-push theory indicate that it is the supply-side factor that leads to inflation. In the same vein, attaining or achieving the SDGs is a direct function of the cost (in terms of expenditures) needed to meet the targeted goals. This is apparently also a supply-side influence or impact. Since both variables are origin of the supply-side indicators, it follows that the cost push theory will influence sustainable development goals (SDGs). This stems from the fact that an increase in the cost of production (in the form of raw material cost, transportation cost and higher wages/salaries to labor etc) will undoubtedly influence the attainment of the SDGs negatively, resulting in a low level of achievements and progress than was the case prior to the increase in production costs. Thus, the higher the cost–push inflation and in-turn the inflation rate in the economy, the lower the success rate of the SDGs and vice-versa. This analysis indicates that the cost push theory of inflation can serve as a theoretical link or foundation between inflation and Sustainable Development Goals, and as such, it is adopted as the theoretical framework for this research piece.

2.5 Empirical literature

Udeh and Ozden (2018), in their study entitled "Poverty Reduction and Sustainable Development in Nigeria" argued that sustainable development is impossible without effective poverty alleviation in Nigeria. The research method used was a literature study, and the researchers observed that the Nigerian government issued several programs to alleviate poverty, such as OFN, People's Bank, and NEEDS. The study found that poverty alleviation is accompanied by the implementation of programs that are not appropriately managed and thus accounted for why it was impossible to achieve sustainable development and security.

Bakri and Utami (2021), in their study "the effect of government bonds, inflation, and exchange rate in achieving SDGs" examined the effect of bonds, inflation rates, and exchange rates on economic growth to achieve Indonesia's 2030 sustainable development goals. The study used a quantitative regression analysis method with a path analysis approach to determine the direct or indirect effect between the variables for the period 2016-2020. The findings from the study reveal that government bonds have a direct and significant effect on economic growth of -1.243. The inflation rate directly affects the economic growth rate of 0.712. The exchange rate had no significant direct or indirect effects on economic growth, movement, or poverty. The study concludes that the government must control inflation so that the economy can achieve and reduce inflation and poverty.

Okoh (2020) investigated "Restructuring Macroeconomic Policy for Sustainable Development in Nigeria**".** This paper examines the various efforts aimed at restructuring macroeconomic policy in Nigeria. These efforts were captured in the SAP of 1986, NEEDS of 2004, the Transformation Agenda of 2011, and the ERGP of 2016. The paper adopted content analysis method of qualitative research given the peculiarity of the subject matter. The study found evidence that during the aforementioned periods, the economy showed signs of growth and development. However, despite the gains of the reforms, Nigeria is still grappling with economic growth and development issues such as unemployment, poverty, and rising cost of living.

Nureni, Oyenuga and Usman (2023) examined "achieving sustainable development goals in the continuous presence of the rampaging covid-19 pandemic in Nigeria" by critically analyzing all the listed seventeen (17) goals based on their framework using the reality concept within the context of the ravaging Covid-19 pandemic in the country. It was observed that the pandemic had jeopardized the production of data that are central to the achievement of SDGs, thus creating serious data gaps in assessing country-level programs toward SDGs. While only four (4) out of the seventeen (17) listed goals appeared feasible for Nigeria, others remained elusive. Further findings also showed that several of the 169 targets set by SDGs for achievement in the year 2020 remains unachieved at moment, hence anticipating an ambitious-like posture for the 2030 agenda.

Febrianti and Indriyati (2020) examined the effects of inflation, poverty, and investment on sustainable development in the West Kalimantan Province of Indonesia. The purpose of this study was to examine how big the effect of Inflation, Poverty, and investment on sustainable development in West Kalimantan Province were partially or simultaneously significant. The data used in this study were annual time series data from 2007 to 2016, with multiple linear regression employed. The partial test results showed that Inflation and Investment had no effect on Sustainable Development in West Kalimantan province, whereas poverty had an effect. Based on the results of the F Test, inflation, poverty, and investment simultaneously had effects on Sustainable Development in the West Kalimantan province.

Kamoun (2019) examined "The Effects of Inflation on Sustainable Growth: The Case of OECD Countries". This study evaluated the effect of inflation on sustainable growth by analyzing the impact of consumption price level on sustainable growth in 12 OECD countries. This was achieved using a panel data model applied to the modified environmental Kuznets curve (MECK) for the case of 12 OECD countries covering the period 1990-2013. This study found a significant and negative effect of inflation on sustainable growth. However, the effect was low.

Onimisi and Nwakile (2020) investigated "Sustainable Development Goals in Nigeria: A review of the implication for Insecurity". This paper employed secondary data and contextually analyzed it to relate the issue of concern with the phenomenon being investigated. This study established that insecurity affects service delivery across other sectors of the economy. This is because budgetary spending on security has negatively affected the performance of key sectors of the economy, such as the economic and social institutions needed to uplift the country from underdevelopment to higher pedestal of development. Insecurity scares away investments in Nigeria's economy particularly the Foreign Direct Investment (FDI). This adversely affects capital formation, thus making unemployment and poverty unabated.

Okonkwo, Okonkwo and Okonkwo (2022) studied "Sustainable Development Goals Achievement in Nigeria: Models for Removing the Root Causes of Indignity of Poverty". The study used the content analysis methodology where existing related secondary materials. The study found that to achieve sustainable eradication of poverty indignity in Nigeria, attention should be shifted to the main root of the problem. This includes re-enacting the 'take-off' stages on the process of development in the country; by revisiting the fundamental stages of growth in the development process from the point the country missed it at colonization, thus formulating and implementing proper development policies for 'agriculture first' in the country.

Ojike, Uwajumogu and Didigu (2021) examined whether education outcomes enhance sustainable development in Nigeria. An Autoregressive Distributed Lag Model (ARDL) bounds test technique was used for the analysis. Adjusted net savings (ANS) were used as a measure of sustainable development. The research found that adult literacy rates had a strong favorable effect on sustainable development in both the short-run and long-run contexts. Secondary school enrolment exhibited a positive, significant impact on sustainable development only

in the long run, while primary school enrolment had an insignificant effect on sustainable development in both the short-run and long-run.

Chuba and Yusuf (2022) investigated monetary policy and sustainable development goals in Nigeria from 1991 to 2020 using an ordinary least squares regression model. The findings indicate a long-run relationship between economic growth and money supply, Treasury bill rate, and domestic credit provided by banks in Nigeria. The money supply and domestic credit provided by banks had a significant positive effect on economic growth; and short-term policy interest rate had a significant negative effect on economic growth in Nigeria, in line with economic theory.

From the empirical studies discussed above, none of the Nigerian study examined the impact of inflation on sustainable development goals. Most of the research in Nigeria has focused on education spending and sustainable development, or COVID-19 and SDGs, while a few others have concentrated on the impact of inflation on sustainable growth. This study addressed the aforementioned gap by studying the impact of inflation on sustainable development goals (SDGs) in Nigeria, using the human development index to measure the sustainability of selected development goals. The study also contributed to the scantily available literature by estimating the short-run and long-run impacts of inflation on SDGs using the ARDL bounds test approach.

3.1 Methodology

This work relied solely on data from secondary sources. In essence, the work used secondary data. Therefore, the basic source of data for this work are the Central Bank of Nigeria (CBN) Statistical Bulletin (for the year 2023) via its website (www.cbn.org), National Bureau of statistics (NBS) annual data report (for the year 2023) via its website (www.nigerianstat.gov.ng), World Bank's Development Indicators (for the year 2023), and other related articles and journals that are relevant to the study. The study used annual time series data spanning from 2000-2023.

3.2 Model specifications

This study econometrically explored the relationship between inflation and sustainable development goals (SDGs) in Nigeria. The econometric model that explored the nexus is the Auto-Regressive Distributive Lag (ARDL) approach. ARDL is a least squares regression approach involving the lag of both the endogenous variable and exogenous variables (Gujarati, 2003). ARDL model is normally denoted using ARDL notion (p_1 q_1, q_2, q_3 ….q_k). Here, P denotes the number of lags of the endogenous variable, q_1 is the number of lags of the first exogenous variable, and q_k is the number of lags of the k^{th} exogenous variable.

It is pertinent to note at this point that this study will focus on the first four (4) goals of the SDGs. These four goals are as follows:

Goal 1: No Poverty

Goal 2: Zero Hunger

Goal 3: Promote Good Health and Wellbeing

Goal 4: Quality Education

The reason for concentrating on these goals can be attributed to the fact that they are strictly welfare centred and people-oriented, unlike the other goals.

This work adopts the model used by Febrianti and Indriyati (2020) in their study titled "the effect of inflation, poverty, and investment on sustainable development in west Kalimantan province, Indonesia" with modification. The model used in their study is shown below:

HDI = *f* (INF, POV, INV), where

HDI = Human Development Index

INF = Inflation rate

POV = Poverty rate

INV = investment rate

The modified form of the model used in this study is as follows:

[1a].....HDI = f (INF, INT, EXT)

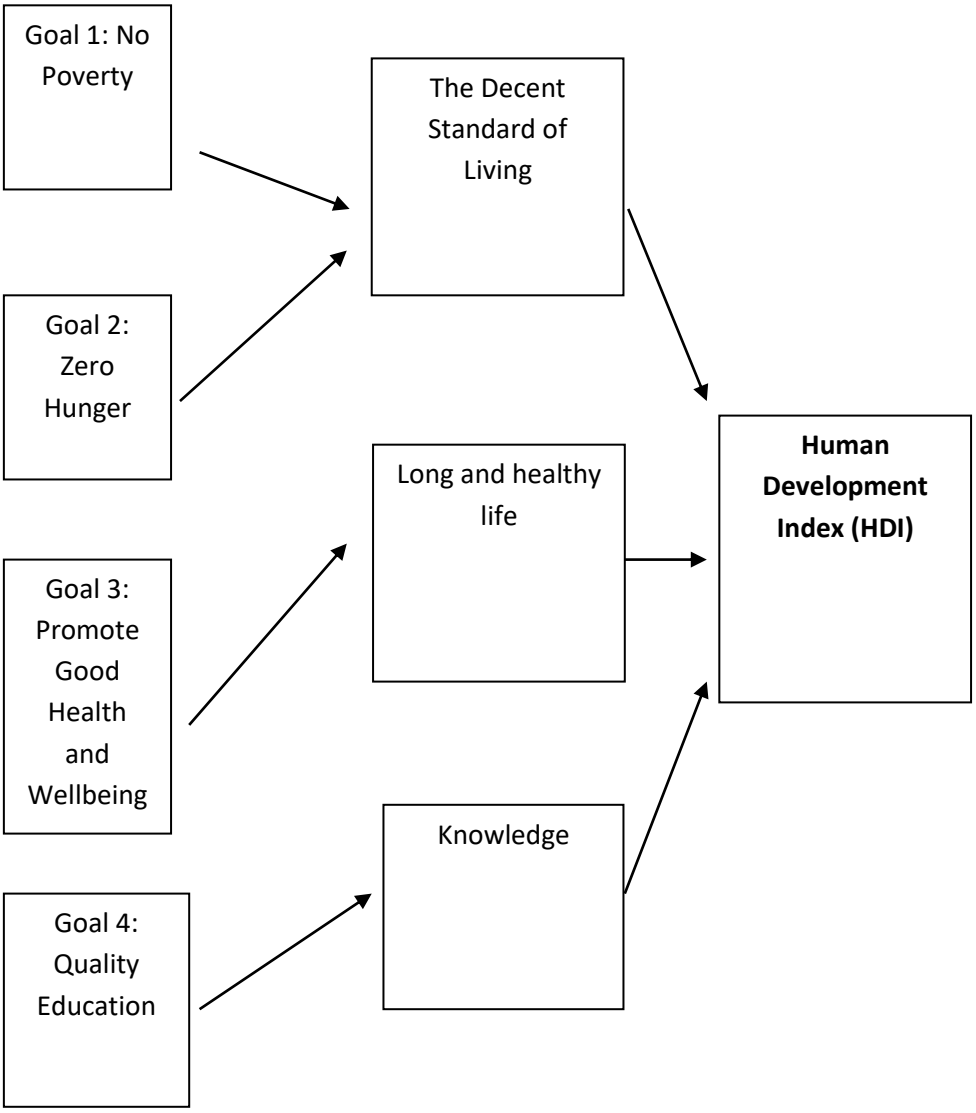
The linear form of the model is expressed as follows:

[1b].....HDI = $\beta_0 + \beta_1 INF + \beta_2 INT + \beta_3 EXT + \varepsilon_t$

Where HDI is the Human Development Index (that was used to proxy or represent Sustainable Development Goals), INF is the inflation rate, INT is the interest rate, and EXT is the exchange rate. The reason for including the interest and exchange rates as explanatory variables stems from the fact that they are associated factors or indices that can easily trigger or stimulate inflation in the economy.

HDI as a dependent variable explains how individuals access the results of their development in terms of income, health, education, and so on. HDI was introduced by the United Nations Development Program (UNDP) in 1990, and it is published regularly in the annual Human Development Report (HDR). HDI is formed by three basic components namely; long life & healthy life, knowledge and a decent standard of living. To justify the adoption of HDI as the dependent variable, the chart below provides the relationship between the first four goals and HDI.

Fig 1: The link between Human Development Index (HDI) and the first four goals is shown in the chart below:



Source: Authors, 2025

4.0 Results Presentation and Discussion

4.1 Unit Root Test for Data Set Stationarity

It is a prerequisite that time series data, such as the set used in this study, be stationary. This is because non-stationary time-series data produce spurious regression; hence, the result may be misleading if adequate techniques are not followed in data analysis. Table 4.1 presents the stationarity test for the variables employed in the study using the Augmented Dickey-Fuller Technique.

Table 4.1: Stationarity Test Result

Variable	ADF Stat	ADF Critical Values @ 5%	Order of Integration	Probability
EXT	5.2174	2.9639	1(1)	0.0002*
HDI	5.1806	2.9639	1(1)	0.0002*
INF	4.5997	2.9639	1(1)	0.0010*
INT	3.3497	2.9639	1(0)	0.0210*

*Indicates a sign at a 5% significance level.

Source: Authors' extraction from Eviews 10, 2025

Table 4.1 shows the Augmented Dickey-Fuller (ADF) unit root test results. The test results demonstrate that the variables are integrated at levels I(0) and first difference I(1). Based on these findings, Interest rate (INT) is stationary at level I(0), whereas the exchange rate (EXT), Human Development Index (HDI), and inflation rate (INF) are stationary at first difference I(1). The stationarity was determined at a 5% significance level. Since the stationarity outcome revealed a mixture of I(0) and I(1), the most appropriate econometric technique will be the Auto-Regressive Distributive Lag (ARDL) approach. Hence, this study employs the autoregressive distributive lag (ARDL).

Furthermore, because the stationary outcome gives a combination of I(1) and I(0) series, the most appropriate test of co-integration is the Autoregressive Distributed Lag (ARDL) Bound Test of co-integration. This is employed for the model in this study and is described in the succeeding section

Table 4.2: Bound Co-integration Test result

F-Bounds Test — Null Hypothesis: No-level relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.98820	10%	1.85	2.85
K	8	5%	2.11	3.15
		2.5%	2.33	3.42
		1%	2.62	3.77

Source: Authors' extraction from Eviews 10, 2025

The Autoregressive Distributed Lag (ARDL) Bound Test of co-integration for this study is presented on table 4.2. The null hypothesis indicates that no long-run relationship between the dependent and independent variables. The decision rule is to reject the null hypothesis when F-statistics of the test is greater than the critical value of the lower bound and upper bound at a chosen level of significance i.e. (5% for this study). On the other hand, the null hypothesis is accepted when the F-statistics is less than the critical value of the lower bound. However, the result of the test indicates that the F-statistic of the variables is 10.98820 with 5% Critical Values of the lower bound being 2.11 and the upper bound being 3.15, respectively. This indicates that the F-statistic of

10.98820 is greater than the Critical Values of the lower and upper bounds in the model. This implies the rejection of the null hypothesis is rejected, whereas the alternative hypothesis is accepted. Hence, the test outcome reveals that there is co-integration (long-run relationship) between the Human Development Index, Exchange Rate, Inflation Rate, and Interest Rate in Nigeria within the study period. This implies that there is co-integration (long run relationship) between the dependent and independent variables in this study. However, with the presence of co-integration among the series being established, the ARDL model will hence be estimated for the short- and long-runs, respectively.

The existence of a long-run relationship between the dependent and independent variables implies that the variables continue to impact or influence one another over a relatively long time. In this regard, it means that Exchange Rate, Inflation Rate and Interest Rate had influence or impact on the Human development index within the study period in the Nigerian economy.

Table 4.3: Short-run ARDL Result

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-729.8045	140.7404	-5.185467	0.0008
HDI(-1)*	-0.449973	0.131606	-3.419080	0.0091
LOG(INF(-1))	-6.593004	1.830500	-3.601751	0.0070
LOG(EXT)**	3.607878	2.507863	1.438627	0.1882
LOG(INT(-1))	-2.371694	4.052180	-0.585289	0.5745

Source: Authors' extraction from Eviews 10, 2025

The short-run ARDL result presented above shows that the error correction term (ECT) has the right sign (i.e. –), a negative coefficient value of -0.449973, with p-value of 0.0091, which is less than 0.05 (i.e. < 0.05). This shows that the model identified a substantial speed of adjustment; hence, last-period deviation from long-run equilibrium is corrected at a speed of 45% annually until a steady state is maintained.

Table 4.4: Long-term ARDL Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INF)	-14.65200	6.007985	-2.438755	0.0406
LOG(EXT)	8.017990	4.422803	1.812875	0.1074
LOG(INT)	-5.270750	8.962743	-0.588073	0.5727
C	-1621.886	655.4296	-2.474538	0.0384

R-squared	0.965984	Mean dependent var	1.321990
Adjusted R-squared	0.941974	S.D. dependent variable	4.053572
S.E. of the regression	0.976452	Akaike information criterion	3.088901
Sum squared residual	16.20880	Schwarz criterion	3.696086
Log likelihood	-33.33351	Hannan-Quinn writer.	3.283145
Durbin-Watson stat	2.700603		

Source: Authors' extraction from Eviews 10, 2025

Based on the long-run result presented above, the inflation rate has an estimated coefficient of -14.7. This implies that if the exchange rate and interest rate are fixed and inflation is increased by one unit, HDI would decrease by 0.147 in Nigeria. In other words, the lower the inflation rate, the higher the tendency for SDGs to be attained or achieved. This conforms to economic apriori expectation, and it is line with the findings and submissions of Febrianti and Indriyati (2020). The effect of the inflation rate on SDGs in Nigeria during the study period is statistically significant, with a probability value of 0.0406. From Table 4.4, the coefficient of exchange rate (EXT) was estimated to be 8.02. This implies that if inflation and interest rates are fixed or held constant, an increase in the exchange rate by 1 unit will would cause HDI to rise by approximately 0.08. Consequently, this implies that an increase in the exchange rate will increase the possibility of attaining the SDGs within the study period. This outcome does not conform to economic apriori expectation and the variable is not statistically significant because it has a probability value of 0.1074.

Interest Rate as an explanatory variable in the result presented above has an estimated coefficient of -5.270750. This implies that a one-unit decrease in the interest rate leads to a 0.527 increase in the human development index when both inflation and the exchange rate are held constant. The finding from the above result conforms to the prior expectation; however, the variable is statistically insignificant with a probability value of 0.5727.

4.5 Post-Estimation Diagnostic Tests for the Short- and Long-run Models

Table 4.51: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.506437	Prob. F(1,7)	0.2594
Obs*R-squared	5.312814	Prob. Chi-Square(1)	0.0212

Source: Authors' extraction from Eviews 10, 2025

From table 4.51 above, since the probability value of the f-stat (0.2594) is greater than 0.05, we accept the null hypothesis and reject the alternative hypothesis and hence conclude that there is no serial correlation in the short- and long-run models of the study.

Table 4.52: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.908360	Prob. F(21,8)	0.1749
Obs*R-squared	25.00786	Prob. Chi-Square(21)	0.2468
Scaled-explained SS	1.894459	Prob. Chi-Square(21)	1.0000

Source: Authors' extraction from Eviews 10, 2025

Table 4.52 shows that the probability value of the f-stat (0.1749) is greater than 0.05, we accept the null hypothesis and reject the alternative hypothesis and hence conclude that there is no heteroskedasticity in the short- and long-run models of the study.

Table 4.53: Ramsey RESET Test

	Value	Df	Probability
t-statistic	0.440014	7	0.6732
F-statistic	0.193612	(1, 7)	0.6732

Source: Authors' extraction from Eviews 10, 2025

Table 4.53 shows that the probability value of the Ramsey reset test (0.6732) is greater than 0.05; we accept the null hypothesis and reject the alternative hypothesis and hence conclude that there are no specification errors in the short- and long-run models of the study.

4.6 Discussion of Findings and Policy implications

The analysis of the finding shows that Inflation has a significant negative effect on attainment of the SDGs within the period under consideration. Thus, the higher the inflation in the economy, the lower the progress recorded in the SDGs in Nigeria. This is because inflation will increase production costs, resulting in lower outcomes in the pursuit of the goals. The policy implication is that inflation must be managed appropriately by the concerned authorities in order to create a more conducive climate in which SDGs can be pursued and achieved easily.

The result from the finding indicates a positive non-significant relationship between exchange rates and the attainment of SDGs in Nigeria. This finding is not far from reality because, with just about 6 years to the expiration of the SDGs, little or nothing has been achieved on any of the 17 SDGs. The nation is still grappling with a severe food crisis, widespread hunger, and enormous malnutrition on the part of children and infants. This shows that Nigeria as a nation is not really integrated into the league of countries that are serious about attaining and achieving the SDGs by or before the December 2030 deadline. Therefore, as a fallout of this scenario, exchange rate spikes and fluctuations will not have any impact on the attainment of the goals, as shown in this study. The policy implication is that with only six years to the deadline of the United Nations' Sustainable Development Goals, Nigeria must take decisive actions and increase its efforts toward the attainment of these goals.

The finding from the result indicates that the interest rate has an inverse non-significant relationship with the SDGs within the study period. This can be justified on the ground that increases in interest rates in the economy usually jack-up inflationary pressures due to the fact that borrowing for investments becomes expensive thereby causing situations of both cost-push and demand-pull inflation. Consequently, from the inverse relationship established between inflation and the SDGs, it follows that the interest rate too will have an inverse relationship with the attainment of the SDGs via inflationary pass-through effects. The policy implication of this is that anti-inflationary measures should be enacted alongside any policy that seeks to increase the interest rate in the economy. By so doing, a situation of both demand-pull and cost-push inflation would be tamed whenever there is an increase in interest rate, and this would have the desired effect or impact on process of attaining the SDGs.

5.1 Conclusion

This study examined the impact of inflation on SDGs in Nigeria. The dependent variable in the study was sustainable development goals proxied by the human development index, while the independent variables were inflation rate, exchange rate, and interest rate. Findings from the study indicate that only the inflation rate had the expected relationship and statistical impact on SDGs in Nigeria within the study period. The findings of this study are closely associated with important resolutions made concerning the Nigerian economy. One of such resolution is that inflation will increase production costs, resulting in lower progress or outcomes in the pursuit of SDGs. The first four SDGs that this study focused on are; no poverty (goal 1), zero hunger (goal 2), good health and well-being (goal 3) and quality education (goal 4). Hence, there is no disputing the fact that achieving such vital goals in the presence of high inflationary pressures will be utterly difficult, if not impossible.

It was also evidenced that the Nigerian economy cannot be said to be integrated into the United Nations circle that is deemed serious and focused on attaining the SDGs. As such, the impact of the exchange rate may not be

felt in the domestic race for the SDGs. Finally, the inverse relationship established between inflation and the SDGs shows that the interest rate too will have an inverse relationship with sustainable development goals via inflationary pass-through effects.

5.2 Recommendation

Based on the findings from the objectives of the study, this study specifically recommends the following:

i. That policymakers should take steps toward achieving economic price stability in the economy. This is because inflation had a significant negative effect on the progress and possibilities of meeting the SDGs before its expiration by December 2030, which is about six years away.

ii. Government and monetary authorities should ensure that interest rates positively impact SDGs by making development funds available to concerned stakeholders at a subsidized rate of interest. This can take the form of concessions and establishing a special credit window for these crucial goals. Moreover, decreasing the interest rate to stimulate domestic progress on the attainment of the SDGs will go a long way to increase the variety of domestic goods, which in the long run is capable of generally lowering inflationary pressures in the economy.

iii. The exchange rate of the domestic currency should be managed appropriately to ensure that the overall or total cost of foreign industrial inputs does not negatively affect the pursuit of the SDGs. The exchange rate should also be managed in such a way that domestic goods will be attractive to and sought-after in the international market. This can be achieved by operating a fixed exchange rate regime rather than a floating exchange rate system.

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