

Research Article

The impact of the COVID-19 Pandemic on the Nigerian Economy vis-à-vis inflation rate and Economic Growth

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ABSTRACT:

This study examined the impact of the COVID-19 pandemic on Nigeria's economy by focusing on the performance of the inflation rate and economic growth within 2010-2020. The objectives of the study include: to ascertain the causality between the rate of inflation and economic growth in Nigeria for the pre and present pandemic period, and to ascertain whether there is a structural break on the economic growth in Nigeria for the pre and present pandemic period. The data used for this study was secondary data collected from the Central Bank of Nigeria (CBN) Statistical Bulletin for various years. The Real Gross Domestic Product (RGDP) was assumed to be a proxy for economic growth, while the Headline Inflation Rate (HIR) was a proxy for the inflation rate. The Chow test analysis and the Granger Causality test were used to analyze the data for the study. The findings of the study showed that an independent causal relationship exists between the rate of inflation and economic growth in Nigeria for the pre-pandemic and during the pandemic period. Also, it was revealed that there is no structural break in the rate of inflation in Nigeria for the pre-pandemic and during the pandemic period. However, it was found that there is a structural break in economic growth in Nigeria for the pre-pandemic and during the pandemic period.

Keyword: COVID-19, Chow Test, Economic Growth, Inflation Rate, Pandemic.

1. INTRODUCTION

The coronavirus belongs to a family of viruses that are responsible for various symptoms such as pneumonia, fever, difficulty in breathing, and lung infections [1-2]. These viruses are known to be common in animals around the world, with very few known cases affecting humans. The World Health Organization was informed in December 2019 of the possible occurrence of a novel coronavirus infectious disease in Wuhan, Hubei Province, China. The virus was then named COVID-19. The epidemic spread to 19 countries with 11,791 confirmed cases and 213 deaths as of January 31, 2020, prompting the World Health Organization to declare it a public health emergency of international concern. Due to the spread of the virus from China to other countries, the COVID-19 virus declared a pandemic on March 11, 2020 [2]. The first case of the virus in Nigeria was announced by the Nigeria Center for Disease Control (NCDC) on February 28, 2020. The total number of the confirmed cases of the pandemic worldwide as of May 30, 2020, was 5,968,693 with 365,796 deaths. The United States of America had 1,749,846 confirmed cases with 102,900 deaths, while Nigeria had 9,855 confirmed cases and 273 deaths attributed to the pandemic.

Due to the increasing spread of coronavirus disease (COVID-19) caused by Severe Acute Respiratory Syndrome, Coronavirus 2 (SARS-CoV-2) authorities around the world have resorted to the lockdown strategy to prevent the virus from spreading. The pandemic affected over 200 countries worldwide within a few months. Although containment measures have been put in place in some countries, the number of reported cases continues to increase as human activities cannot be eliminated [3]. As predicted, there are serious concerns about the global sustainability of national health systems, with a particular focus on Africa. The population of the world's hardest hit by the pandemic was found to be the elderly and people with pre-existing medical conditions. On 31 January 2020, the World Health Organization following the trend of COVID-19 pandemic across the world listed Nigeria among other 13 African countries identified as high-risk for the spread of the virus. The federal government of Nigeria on that note set up a Coronavirus, Preparedness Group to mitigate the impact of the virus in the country.

As in most countries in the world, the Nigerian government resorted to the lockdown strategy to prevent the virus from spreading, particularly when it was discovered that the main means of transmission of the COVID-19 were droplet transmission, contact transmission, and aerosol transmission [4]. Droplet transmission occurs when someone infected with the virus coughs or sneezes and an uninfected person in close proximity breathes it in. The COVID-19 can also be transmitted when an infected person touches a surface or comes in contact with an uninfected person who ends up touching their mouth or nose. However, the sensitization process for the management of the transmission of the COVID-19 has been centred on the restriction of gatherings and close contacts; especially gatherings such as places of worship, banks, parties, beaches, shopping malls, offices, schools and airports. However, it will be of interest to note that these activities being restricted in order to minimize the spread of the COVID-19 contributes in one way or the other to the economic activities of the countries; and the restriction is expected to affect the country's economic growth. However, the adoption of a lockdown strategy is to minimize the wild spread of the virus. Aside the preventive measures such as using a face mask, avoiding contact with infected people, using disinfectants, coughing or sneezing into tissue or a bent elbow, avoid touching the face or nose.

The coronavirus crisis is an unprecedented shock for the world's economy especially developing economy like Nigeria: its effect on economic activity is clearly negative, and the magnitude and duration of the impact on inflation and economic growth raises more questions. There are downward pressures such as the decreases in consumption due to the lockdown and the fall in oil prices, but also upward pressures such as the closure of factories and the general reduction in production. Also, there needs to be a clear separation between the short-term effects (during the containment phase), the medium-term effects (during the recovery phase), and the long-term effects (when we reach the post-crisis period). The debate about the causality associated with the inflation rate and economic growth, which is linked to the financialization of the commodity market, goes back to the emergence of COVID-19. However, some researchers have argued that the COVID-19 pandemic is likely to have short-term economic effects that will, in turn, affect most of the world's economies, particularly developing countries like Nigeria.

The objectives of this study includes: to ascertain the causality between the rate of inflation and economic growth in Nigeria for the pre and present pandemic period, to ascertain whether there is a structural break on the rate of inflation in Nigeria for the pre and present pandemic period, and to ascertain whether there is a structural break on the economic growth in Nigeria for the pre and present pandemic period.

2. REVIEW OF RELATED LITERATURE

The review by [3] noted that while the government has some control over these difficult domestic decisions, there is little they can do to prevent external shocks related to the COVID-19 pandemic. With around two-thirds of the global economy being blocked or quarantined in some way, global supply chains are disrupted, demand is weakened and commodity markets are in turmoil. Countries in sub-Saharan Africa are particularly at risk for foreign exchange and government revenue because of their low economic diversification, their relative openness and the excessive reliance on a limited range of export goods. Due to disruptions in international travel, tourism revenues in sub-Saharan Africa are expected to decrease by 32%, while foreign direct investment could decrease by 30 to 40%. Households in sub-Saharan Africa could be directly affected by the projected 23% decline in personal remittance income this year [5]. In addition, the authors argued that countries around the world have resorted to social distancing, travel restrictions, and economic barriers to reduce the transmission of COVID-19. The socio-economic costs of these blunt measures are expected to be high, especially in sub-Saharan Africa. The results of the multiplier model of the Social Accounting Matrix show that although Ghana's urban lockdown was in effect for only three weeks in April 2020, it likely resulted in a 27.9% decline in GDP over that period, while another 3.8 million Ghanaians became temporarily poor. Compared to the government's revised GDP growth rate of 1.5% for 2020, the model predicts a decline of 0.6% to 6.3% in 2020, depending on the pace of recovery. The authors focused on the effect restrictions due to the pandemic on economic activities in Sub-Saharan Africa using descriptive statistic such as percentage distribution in the delivery of their work. However, the authors did not consider the effect of the pandemic on the economy

in relation to economic growth and the rate of inflation in the region. Hence, the present study will employ inferential tools such as the Chow test analysis and the granger causality test to examine the effect of the pandemic on the Nigerian economy vis-à-vis the pre and present pandemic perspective

The study by [1] focused on some preliminary estimates of the behaviour of the oil supply nexus during the COVID-19 pandemic. The study took into account behaviour for periods before and after the announcement of the pandemic. The authors used the Panel Vector Autoregressive (pVAR) model to analyze the response of oil and stocks to shocks. A panel logit model was also used to assess the likelihood of a negative oil price and stock returns between the two data samples. The result of the pVAR analyzes suggests that both oil and stock markets may have greater initial and sustained effects from intrinsic and cross shocks during the pandemic than in the period before it. The authors considered the effect of restrictions due to the pandemic on oil supply in Africa. However, the authors did not consider the effect of the pandemic on the economy in relation to economic growth and the rate of inflation in Africa.

Speaking on the falling oil price during the outbreak of the COVID-19, the study by [4] stated that Nigeria is in the midst of the worst recession since the global financial crisis. The study used percentage distribution in the delivery of the work. However, the author argued that the economic downturn in Nigeria was triggered by a combination of falling oil prices and spillovers from the Covid-19 outbreak, which not only resulted in a drop in demand for oil products but also halted economic activity when social distancing measures were enforced. The government responded to the crisis by providing financial assistance to businesses, not households, affected by the outbreak. The Monetary Authority adopted an accommodative monetary policy and offered some sectors targeted support of 3.5 trillion loans. These efforts should have prevented the economic crisis from occurring, but they did not. For economic reasons, economic actors refused to become infected with the COVID-19 disease, which was spreading very quickly at the time. The author focused on examining the Covid-19 impact on Nigeria and the structural weaknesses in Nigerian infrastructure that will help manage the current economic crisis and discuss the prospects for reform. However, the study fails to consider the impact of the pandemic on the Nigerian economy and employed on the descriptive statistic in analyzing the data obtained for the study.

Considering the impact of the pandemic on the Indian economy, [6] argued that the COVID-19 outbreak brought social and economic life to a standstill. Hence, their study focused on assessing the impact on affected sectors such as aviation, tourism, retail, capital markets and oil. International and domestic mobility is limited, and travel and tourism revenues, which account for 9.2% of GDP, will be a major drag on the rate of GDP growth. The study employed percentage distribution for the data analysis. Aviation revenues will decrease by \$ 1.56 billion. Oil fell to an 18-year low of \$ 22 a barrel in March, and foreign portfolio investors (FPIs) pulled huge amounts out of India, around \$ 571.4 million. While lower oil prices will reduce the current account deficit, reverse capital flows will widen it. The rupee depreciates continuously. The crisis witnessed a terrible mass exodus of such a floating migrant population on foot amid a nationwide lockdown. Her main concerns were the loss of a job, the daily ration and the lack of a social security network. India needs to rethink its development paradigm and make it more inclusive. COVID 19 has presented some unique opportunities to India as well. There is an opportunity to participate in global supply chains; multinational companies lose confidence in China. Some reforms are required for Make in India, including labour reforms.

According to [7], the pandemic sparked a range of policy measures, including public health and education campaigns, fiscal and monetary measures, restrictions on large parts of the economy, and compensatory measures in the form of social protection for the poor and vulnerable [8]. The sudden outbreak of the pandemic and the magnitude of the policy responses

caused significant economic costs to the Nigerian people, but the nature of the impact on food systems and the poor remains unclear. This provides an initial assessment of the economic impact of COVID-19 and immediate social distancing policies to curb the spread of the virus in Nigeria. In their analysis, large economic impacts are caused by external shocks (e.g., the slowdown in global oil demand and a global economic recession), as well as domestic policies to reduce virus transmission (i.e., forced social distancing). Though authors considered the impact of the pandemic on selected sectors of the Nigerian economy, however, the study failed to consider the impact of the pandemic vis-à-vis the pre and present pandemic situation. In addition, the study added that the four main channels of impact considered in their study, including (i) government revenue deficits; (ii) reduced international transfers; (iii) direct effects of a 5-week lockdown policy that restricted passenger traffic and economic activity within the Federal Capital Territory (FCT) in Abuja and the states of Kano, Lagos and Ogun, as well as state-level lockdowns that lasted 8 weeks in the states Akwa Ibom, Borno, Ekiti, Kwara, Osun, Rivers and Taraba; and (iv) indirect effects of the lockdown policy on the rest of the country outside the affected sectors or areas. Economic impacts are assessed based on their impact on national gross domestic product (GDP), agri-food system GDP, and the number of people living below the international poverty line of \$ 1.90 per day. It has been estimated that national GDP fell sharply during the country's lockdown period and that Nigeria will experience a recession in 2020. In particular, the lockdown policy reduced Nigerian GDP by \$ 11 billion, or 23%, in the eight weeks. Depending on the nature of the economic recovery in the second half of 2020, we estimate that GDP will be between 6% and 9% lower than what was expected in 2020 before the onset of COVID-19. The estimated contraction of the economy was in line with global projections. The authors tried by considering the impact of the pandemic on selected sectors of the Nigerian economy such as agricultural system and the poverty rate, however, the study failed to consider the impact of the pandemic vis-à-vis the pre and present pandemic situation.

A report by [9] stated that the COVID-19 pandemic is devastating the global economy. The global economic outlook was fragile even before the coronavirus crisis broke out. When the outbreak broke out in China, it was initially believed that the negative impact on the global economy would be small, largely due to the decline in production in China and its impact on global supply chains, tourism and commodity markets. However, with the rapid spread of Covid-19 around the world and the ensuing introduction of containment measures and restrictions, all countries are facing severe supply and demand shocks regardless of their connections to global supply networks. In each country, containment measures have affected all economic sectors to varying degrees. Production has fallen, investment plans are on hold, consumer spending has fallen sharply, and job losses have increased. Sentiment in the financial markets has deteriorated, foreign direct investment inflows are falling and emerging economies are seeing large capital outflows. The global economy is currently in a recession that is likely to be far deeper than it was during the 2009 global financial crisis.

The coronavirus crisis could have an impact on inflation in the medium term as it could lead to structural changes in our economies. The pandemic situation has shown that global supply chains, which are very vulnerable to major shocks, are vulnerable. This could lead companies to rethink the geographical distribution of their production structures. Also, the local production of strategic goods such as medicines and food is likely to be promoted in Nigeria. This force could reverse the disinflationary effect of globalization over the past few decades (due to the efficiency gains it brings). In the literature review, however, it was found that the crisis can also have a lasting effect on the behaviour of consumers and companies, which can be more cautious in their consumption and investment decisions or lead to permanent changes in consumer baskets. The results of the reviewed literature showed that the majority of authors focused more on the economic crisis and the impact of the pandemic on the economic sectors of most of the world's countries such as Europe, America and Africa. However, no literature has taken into account the impact of the pandemic on the pandemic about the pre and present

pandemic situation. Also, it was also found that apart from the importance of the impact of the pandemic on macroeconomic indicators such as the rate of inflation and economic growth in Nigeria, there is still a gap in studying the impact of the pandemic vis-à-vis the pre and present pandemic situation on the Nigerian economy.

3. MATERIAL AND METHOD

3.1 Source of Data

The data used for this study is a secondary data collected from the Central Bank of Nigeria (CBN) Statistical Bulletin for various years. The data comprises of quarterly report of Headline inflation rate (HIR) and real gross domestic product (RGDP) from 2010 to 2020.

3.2 Methodology

Time Series Analysis

Time series refers to that body of principles and techniques which deals with analysis of the observed data X_t , ($t=1, 2, \dots, n$) in order to gain an understanding of the underlying dynamics of the process X_t , $t \in z$

Approaches to Time Series Analysis:

The three major approaches to time series analysis are:

- a) Analysis in Frequency Time Domain: Here a function called autocorrelation function is used to describe the evolution of the process through time.
- b) Analysis in Frequency Domain: in this approach, a function called the spectral density function which describes how the variations in time series may be accounted for by cyclical component at different frequencies is used.
- c) Simple Descriptive Technique: This is a traditional approach which involves the decomposition of the series into four components. Namely:
 - i. The Trend (T_t)
 - ii. The Seasonal Variation (S_t)
 - iii. The Cyclical Variation (C_t)
 - iv. The Irregular Component (I_t)

A simple description technique is to plot the data and look for trends, seasonal and cyclical variations. Time series is, therefore, a function of the trend, seasonal variation, cyclical variation and irregular fluctuation or variation.

Component of Time Series:

These explain the movements and direction of the observation used in forecasting time series in future. The components include:

- i. Trend
- ii. Seasonal variation
- iii. Cyclical variation
- iv. Residual or irregular influences

The first three are re-occurring components while the last is none recurring. It follows no regular pattern of activity and does not have any statistical regulatory. Hence, it is an irregular influence. The components interact to account for the variations in the value overtime.

i. Trend:

This refers to the general direction in which the graphs of a time series appear to stretch over a long period. This general direction can be either a downward or an upward movement of a time series. Trends give a picture of the general tendency in the development process. It suggests whether a company is expanding or shrinking over the long term. There are several methods of calculating the trend, but only one of them is used in this research: the least-squares method.

ii. Seasonal variation

This takes regular variability patterns into account within certain periods, for example one year. The variability does not always correspond to the seasons. For example, there can be seasonal behaviour within a week and a day.

iii. Cyclical variation

This refers to long-term fluctuations or fluctuations in the trend. These cycles, as they are sometimes called, may or may not be periodic. An important example of cyclical movements is the so-called business recession, depression and recovery. The cyclical component can be ignored for short periods..

iv. Residual or irregular influences

These are sometimes referred to as irregular variations in a time series. They are usually short-lived and do not follow regular or systematic patterns. Sometimes they produce long-lasting effects. They can be unpredictable or result from isolated special events such as good or bad news, wars, strikes, etc. The cyclical and irregular components cannot easily be described by mathematical models. They are sometimes referred to as residual variations.

In practice, most of the macroeconomic variables that are indexed by a time parameter are usually found to be non-stationary. The distribution of a time series data set is considered stationary if its mean and variance over the observed period are independent of time, while the value of the covariance between two periods depends only on the gap between the periods and not on the actual point in the time that takes this covariance into account [10]. Assuming either or both of the above conditions are not met, the process can be said to be temporary. The stationarity of time series data can be examined with one of the following tools: the Augmented Dickey-Fuller (ADF) test, the Phillips-Perron test or the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. In the present study, the ADF test uses the stationary status of the data received for the study.

The Augmented Dickey-Fuller (ADF) test

The augmented Dickey-Fuller test is used to test that the unit root is present in sample time-series data. The augmented Dickey-Fuller statistic used in the test is a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a root of unity at a certain level of confidence. A classic method of testing the unity root is testing with Augmented Dickey-Fuller and with Intercept. If the test statistic is < critical values (i.e., less than the negative value), reject H_0 : No unit root. Otherwise, choose the first difference and continue until you reject H_0 . The amount of differentiation required to reject H_0 = order of integration = number of roots of unity.

The restrictive and general ADF models are written as follows: (1) and (2), respectively:

$$\Delta y_t = \rho_1 y_{t-1} + \sum_{j=1}^k \alpha_j \Delta y_{t-1} + \varepsilon_t \tag{1}$$

$$\Delta y_t = \alpha_0 + \rho_1 y_{t-1} + \sum_{j=1}^k \alpha_j \Delta y_{t-1} + \varepsilon_t \tag{2}$$

Where, Δ represents the first difference operator, ε_t represents the random error term that is independent and identically distributed (iid), k represents the number of lagged differences, ρ and α are the parameters to be estimated, while y represents the variable of interest such as RGDP and HIR in the present study.

The unit root test can be performed under the null hypothesis $\rho = 0$ against the alternative hypothesis of $\rho < 0$. The decision rule is to compare the calculated ADF statistics with the critical values from Fuller's table. If the test statistic is less than the critical value, the null hypothesis is not rejected, and this indicates that the series is not stationary or not integrated on the order of zero. The p -value of the test can also be compared to the significance level to determine whether the series is stationary or non-stationary. Note that if a variable is stationary without differentiation, it is said to be integrated of order zero, while if a variable is stationary only after the first difference, it is said to be integrated of order one.

Causality Test

Testing causality between variables is very important, and this is because, in most cases, correlation does not imply causality. There is also always the possibility of ignoring common factors in practice. The causal link between variables can disappear when the common causes that were previously ignored are taken into account. The Granger causal test assumes that the information useful to predict each variable is only contained in the variable's time-series data. Causality can refer to a test to measure the ability to predict future values from a particular time series using previous values from another time series. A time series X is said to cause Granger Y if a series of F tests with lagged values of X (including lagged values of Y) shows that those X values provide statistically significant information about future values of Y.

The Granger causality test considers the following pair of regression model:

$$Y_t = \sum_{i=1}^n \alpha_i X_{t-i} + \sum_{j=1}^n \beta_j Y_{t-i} + u_{1t} \quad (3)$$

$$X_t = \sum_{i=1}^n \lambda_i X_{t-i} + \sum_{j=1}^n \delta_j Y_{t-i} + u_{2t} \quad (4)$$

Where, u_{1t} and u_{2t} represents that the disturbances are assumed to be uncorrelated. Also, equation (3) maintains that current Y is related to past values of itself as well as that of X, and (4) posits a similar behavior for X. In the present study X and Y represents the variables considered in the study RGDP and HIR. The F test statistic presented below as equation (5) is used to make inference:

The null hypothesis can be states as

$$H_0: \sum_{i=1}^n \alpha_i = 0 \text{ (lagged X term does not belong in the regression)}$$

$$F = \frac{(RSS_R - RSS_{UR})}{\frac{m}{(n-k) RSS_{UR}}} \quad (5)$$

The equation (5) follows the F distribution with m and (n-k) degree of freedom. Where m represents the number of lagged X terms, n represents the number of observation, and k represents the number of parameters estimated in the unrestricted regression. The restricted residual sum of squares (RSS_R) can be obtained by regressing the current Y on all lagged Y (LY) terms and other variables if any, but excluding the lagged X (LX) variables in the regression. The unrestricted residual sum of squares (RSS_{UR}) can be obtained by running the regression including the lagged X (LX) terms. The decision rule was to reject the null hypothesis when the computed F value exceeds the critical F value at the chosen level of significance.

The Chow Test

The Chow test is often used to determine if there are different subgroups in a population of interest. The goal of the Chow test is to check whether the coefficients are the same in two linear regressions on different data sets [11]. In econometrics, it is most often used in the analysis of time series to check the presence of a structural break in a period that can be assumed to be known a priori. For example a pre and post-event periods such as economic performance during the military regime (pre) and the emergency of the 4th Republic (post) in Nigeria.

A special and useful application of the F-test procedure is found in the Chow test statistic to test the presence of a structural break in a particular data set. For the Chow test, a structural break is said to be detected when the coefficients of the model change with regards to a time parameter.

$$F = \frac{(RSS_T - (RSS_1 + RSS_2))}{\frac{k}{(n_1 + n_2 - 2k)}} \approx F(k, n_1 + n_2 - 2k) \quad (6)$$

Where,

RSS_T represents the residual sum of squares for the full model

RSS_1 represents the residual sum of squares for the first sub sample or first reduced model

RSS_2 represents the residual of the second sub sample or second reduced model,

k is the number of parameters,

n_1 and n_2 represents the length of the two subsamples.

3.3 Data Presentation

Table 1: Quarterly distribution of Real Gross Domestic Product (RGDP) and Headline Inflation Rate (HIR) in Nigeria from 2010-2019

Year	Quarter	RGDP (Million Naira)	HIR (%)
2010	Q1	12583478.33	11.18
2010	Q2	12934530.67	11.09
2010	Q3	14304438.44	11.43
2010	Q4	14789816.74	12.03
2011	Q1	13450716.68	11.75
2011	Q2	13757732.02	11.7
2011	Q3	14819619.26	11.35
2011	Q4	15482973.81	11.2
2012	Q1	13915506.03	11.19
2012	Q2	14323047.77	11.39
2012	Q3	15645434.73	12.67
2012	Q4	16045904.51	13.07
2013	Q1	14535420.95	12.29
2013	Q2	15096763.55	10.13
2013	Q3	16454372.46	8.23
2013	Q4	17132164.77	7.13

2014	Q1	15438679.5	6.67
2014	Q2	16084622.31	7.23
2014	Q3	17479127.58	7.67
2014	Q4	18150356.45	7.3
2015	Q1	16050601.38	7.1
2015	Q2	16463341.91	7.1
2015	Q3	17976234.59	7.4
2015	Q4	18533752.07	7.98
2016	Q1	15943714.54	8.49
2016	Q2	16218542.41	9.35
2016	Q3	17555441.69	10.6
2016	Q4	18213537.29	12.07
2017	Q1	15797965.83	13.41
2017	Q2	16334719.27	13.88
2017	Q3	17760228.17	13.57
2017	Q4	18598067.07	13.13
2018	Q1	16096654.19	12.69
2018	Q2	16580508.07	12.32
2018	Q3	18081342.1	11.92
2018	Q4	19041437.59	11.37
2019	Q1	16434552.65	10.88
2019	Q2	16931434.89	10.45
2019	Q3	18494114.17	10.06
2019	Q4	23487525.01	9.81
2020	Q1	35647406.08	9.67
2020	Q2	34023197.60	9.82
2020	Q3	39089460.61	10.18
2020	Q4	34835301.84	12.32

Source: CBN Statistical Bulletin, 2020

4. DATA ANALYSIS AND RESULT

This section deals with data analysis using the tools discussed in the previous section (methodology) and the interpretation of the results.

4.1 Data Analysis

The result obtained in table 2 below shows the descriptive properties of the data presented in table 1.

Table 2: Descriptive Analysis of RGDP and HIR in Nigeria

S/N	Variable	Mean	Standard Deviation	Median	Skewness	Kurtosis
1.	RGDP_Full	17616845	5154430	16334719	2.73	7.27
2.	HIR_Full	10.51	2.07	11.14	-0.42	-0.94
3.	RGDP_PRE	16325461	2015392	16157598	0.89	2.81
4.	HIR_PRE	10.51	2.14	11.19	-0.43	-1.05
5.	RGDP_DUR	34835302	812104	34835302	0.01	0.001
6.	HIR_DUR	10.50	1.23	10.00	1.83	3.37

Source: Eview 9.0

Where, RGDP_Full represents the full Real Gross Domestic Product (RGDP);

RGDP_PRE represents the pre pandemic Real Gross Domestic Product;

RGDP_DUR represents the during pandemic Real Gross Domestic Product;

HIR_Full represents the full Headline Inflation Rate (HIR);

HIR_PRE represents the pre pandemic Headline Inflation Rate (HIR); and

HIR_DUR represents the during pandemic Headline Inflation rate

The result presented in Table 2 found the mean value of RGDP_Full as ₦17,616,845, RGDP_PRE as ₦16325461, RGDP_DUR as ₦34,835,302, HIR_Full as 10.51%, HIR_PRE as 10.51%, and HIR_DUR as 10.50%. Also, a positive Skewness and Kurtosis were obtained for RGDP_Full (₦2.73 Million and ₦7.27 Million), RGDP_PRE (₦0.89 Million and ₦2.81 Million), RGDP_DUR (₦0.01 Million and ₦0.001 Million), and HIR_DUR (1.83% and 3.37%). This result implies that the most of the distribution of the variables was concentrated towards the left of the distribution and that the right tail is longer than the left one. While a negative Skewness and Kurtosis was obtained for HIR_Full (-0.42% and -0.94%), and HIR_PRE (-0.43% and -1.05%). This result indicates that the most of the distribution of the variables was concentrated towards the right and that the long tail is left-located.

Testing the variables for Stationarity

In order to make sure one is not carrying out a misleading (spurious) regression, the variables employed were subjected to a stationarity test. A stationary process is a process or series whose properties do not depend on the time at which the series is observed. For this purpose, the Augmented Dickey-Fuller (ADF) test was used to test the stationarity of the data.

Table 3: Result of Augmented Dickey-Fuller unit root test for the variables

Variables	Level		1 st Difference		Order of integration
	No Trend	With Trend	No Trend	With Trend	
RGDP	-0.0946	-1.1748	-6.0802	-6.2285	I(1)
HIR	-1.7408	-1.7939	-3.0355	-3.7361	I(1)
Critical values					

1%	-3.592462	-3.518090	-3.596616	-3.520787	
5%	-2.931404	-3.189732	-2.933158	-3.191277	

Source:
Eview

w 9.0

The result of the unit root test on the variables using the Augmented Dickey-Fuller test statistic obtained in Table 3 found that the RGDP and the HIR series has no unit root and stationary overtime at the first difference since the test statistic value has more negative values (-6.2285 and -3.7361 respectively) than the critical value (-3.1913) at 5% significant level. This result implies that the series are integrated of order 1 (I(1)) and stationary over the study period.

Testing for causality between the RGDP and HIR for the pre and present pandemic period

This section assesses the causality between RGDP and HIR for the pre pandemic period and during the pandemic period.

Table 4: Result of Granger Causality Tests amongst the variables

Pairwise Null Hypothesis	F-Statistic	p-value
HIR does not Granger Cause RGDP	0.2246	0.7999
RGDP does not Granger Cause HIR	2.6564	0.0836
HIR_PRE does not Granger Cause RGDP_PRE	0.2541	0.7771
RGDP_PRE does not Granger Cause HIR_PRE	0.2821	0.7560
HIR_DUR does not Granger Cause RGDP_DUR	0.6338	0.5378
RGDP_DUR does not Granger Cause HIR_DUR	1.6152	0.2162

Source: Eview 9.0

The result of the causality analysis presented in Table 4 showed that the relationship amongst the variables are independent or have no direction since the p-values (0.7999, 0.0836, 0.7771, 0.7560, 0.5378 and 0.2162) for the various pairs was found to be greater than 0.05 significant level. This result implies that there is no causality between the rate of inflation and economic growth in Nigeria for the pre-pandemic and during the pandemic period.

Chow Test Analysis to determine the impact the pandemic on economic growth and the rate of inflation in Nigeria

This section presents the result of Chow test analysis on the impact of the COVID-19 on inflation rate in Nigeria. The result of the Chow test analysis for assessing the impact of the pandemic on inflation rate and economic growth is presented in table 5 and 6 respectively.

Table 5: Result of Chow test analysis for assessing the impact of the pandemic on inflation rate in Nigeria

Variable	Test Value	
	F-statistics	Prob. F(2,89)
HIR	0.0772	0.9258

Source: Eview 9.0

The result obtained in Table 5 found an F-value of 0.0772 and a corresponding p-value of 0.9258, which falls within the acceptance region of the hypothesis since the p-value of 0.9258 was found to be greater than the 0.05 significance level. This result implies that the COVID-19 does not have a statistically significant impact on the inflation rate in Nigeria; hence, there is no structural break in the rate of inflation in Nigeria for the pre-pandemic and during the pandemic period.

Table 6: Result of Chow test analysis for assessing the impact of the pandemic on economic growth in Nigeria

Variable	Test Value	
	F-statistics	Prob. F(2,89)
RGDP	249.98	0.000*

Source: Eview 9.0

The result obtained in Table 6 found an F-value of 249.98 and a corresponding p-value of 0.00, which falls within the rejection region of the hypothesis since the p-value of 0.00 is less than the 0.05 significance level. This result implies that the COVID-19 has a statistically significant impact on economic growth in Nigeria; hence, there is structural break in economic growth in Nigeria for the pre-pandemic and during the pandemic period.

5. CONCLUSION

This study considered the impact of the COVID-19 pandemic on Nigeria's economy by x-raying the performance of the inflation rate and economic growth within the observed period. The RGDP was assumed to be a proxy for economic growth, while the HIR was a proxy for the inflation rate. The result of the study showed that mean economic growth during the COVID-19 (N34835302) was higher than the mean economic growth before the COVID-19 (N16325461) pandemic. The mean inflation rate before the COVID-19 (10.51%) was also slightly higher than the inflation rate during the COVID-19 pandemic (10.50%). The increase in economic growth and decrease of inflation rate during the pandemic may be attributed to the free-will donations or palliatives by the international community and well to do individuals across the country to ease the suffering of the people during the pandemic.

Also, it was found that the series of economic growth and inflation rate are integrated on the order of 1 and are stationary during the investigation period. This indicates that the data can be used for parametric time series analysis such as the Chow Test and the Granger Causality Test.

Hence, an independent causal relationship was found to exist between the rate of inflation and economic growth in Nigeria for the pre-pandemic and during the pandemic period. This result indicates that there is no causality between the rate of inflation and economic growth in Nigeria for the pre-pandemic and during the pandemic period. Result revealed that there is no structural break in the rate of inflation in Nigeria for the pre-pandemic and during the pandemic period. This outcome is in line with the result obtained by [12] who found that the core inflation rate is more persistent in volatility than headline inflation. However, it was found that there is a structural break in economic growth in Nigeria for the pre-pandemic and during the pandemic period. This result is in line with the findings by [3] who stated that the pandemic declined the Ghanaian GDP over their study period. In addition, the outcome agrees with the study by [13] who found that there is a structural change in economic growth in Nigeria with their study period. Also, [1] noted that both oil and stock markets in Nigeria experienced negative shocks during the pandemic than in the period before it. Hence, this can be attributed to the lockdown on economic activities during this period as well as the closure of local and international borders.

Also, it was found that the inflation rate is not influenced by economic volatility because headline inflation is an economic term that describes the sustained increase in the prices of goods and services over some time. However, economic growth on the other hand was found to be volatile against economic shocks because it includes the total monetary or market value of all manufactured goods and services produced within a country's borders in a given period. As a general measure of total domestic production, economic growth acts as a comprehensive scorecard for a given country's economic health and it is evident that the Nigerian economy has not been stable over time especially since the President Buhari administration in 2015.

Based on the outcome of the study, the following recommendations were made:

- i. The study recommends the introduction of measures such as local production of face masks, hand gloves and other preventive products that would encourage labour-intensive high productivity in manufacturing and services during the pandemic period as being experienced presently across the world. This will ensure that the sector are functional during the period and thereby does not affect the government income, particularly from manufactured products since they play a major part in the performance of the real gross domestic product especially during the pandemic period.
- ii. The present study revealed that the pandemic has a significant impact on the economic growth in Nigeria; hence, there is an urgent need for sensitization programmes in the rural areas across the states to help in curbing the transmission of the pandemic and especially the importance of personal hygiene in the management of pandemic since most of the domestic products that boost the economy are being produced in these areas.

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