



Effects of Covid-19 pandemic on commodity price volatility and the welfare of farming household in Nigeria

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Abstract

The evolving uncertainty of the emergence of the COVID-19 pandemic has adversely impacted some commodity prices, the welfare of farming households, and the economic growth and development of the country. The study is aimed at assessing the effects of Covid -19 pandemic on commodity price volatility and the welfare of farming households in Nigeria. The study was based on secondary data from (2010-2022, and forecasts from 2023 -2026), collected from the Central Bank of Nigeria publication, IMF World economic outlook, and the World Bank report. Time- response graph and Autoregressive Moving Average (ARMA) was used to analyze the trend of the inflation rate, and T-test statistics, were used to test the relationship between the real income of farming household before and during the pandemic. The result showed that prices of some commodities doubled after the pandemic. There is a significant difference between the real income of farming households before and during the pandemic. The study recommends that a price control mechanism should be put in place to manage the affordability of goods and services in the market because this has a direct effect on the growth and development of the country.

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Introduction

The COVID-19 pandemic has become one of the most serious threats to life and the global economy. Lockdowns of economic activities (eg, partial market closures and social distancing) instituted by the government of different countries and including the Nigerian government to reduce the impact of the virus have adversely affected the prices of commodities and the welfare of farmers (Nadeem, 2020). Nigeria, like all the nations of the world, is navigating these uncertain times.

Disruption of economic activities like laying off of workers, salary cuts by as high as 75%, and compulsory leave without pay, brought about by the COVID-19 pandemic has resulted in the general increase in commodity prices, a fall in the purchasing value of money and other business uncertainties necessitating critical decisions for survival, (Ozili and Arun 2020, and Ayanlade & Radeny, (2020). The global stock dipped with a stock market loss of about USD 6 trillion within a week of the pandemic outbreak declaration, while most countries recorded the highest unemployment rate (14.7%), (Bernanke 2020). Nigeria is not left out of the crisis as the price of commodities increased with a fall in the price of crude oil (being the major export and foreign currency earner for Nigeria). Barro *et al.* (2020), reported that the price of crude oil as of January 2021, was about \$54.77, (compared to what price before the pandemic ???) and highly unstable, while Nigeria forecasted \$57. The price difference has made the government borrow to cushion the effects of the pandemic, Ozili, and Arun (2020).

In addition to the increase in commodity prices, the COVID-19 pandemic caused a temporary shutdown of all most all the economic activities in the country and this had a tremendous impact on farming household welfare, Nkengasong, and Mankoula (2020). This had a drastic effect on agribusinesses leading to low production, especially for essential firms producing consumables goods and services; thus escalating commodity price volatility. Although before the outbreak of covid-19, some factors such as the price

factors of production, government policy, and demand-pull inflation had been responsible for the excess rise in prices of commodities, Enwa and Ewuzie (2020). The outbreak of COVID-19 has worsened the situation. Naira metrics (2022), noted that the pandemic resulted in food inflation as well as excessive rise in prices of goods and services like never before. On a month-to-month basis, the food sub-index increased to 2.05% in June 2022, up by 0.03% points, 2.01% recorded in May of the same year of 2022, (<https://nairametrics.com>, 2022).

The adherence to government regulations in a bid to curtail the effect of the pandemic reduced the workforce of many manufacturing firms, thereby affecting their productivity and outcome (Adesoji and Simplice 2020). This also led to core inflation, which excludes the prices of volatile agricultural produce increased by 0.85% points compared to 14.9% recorded in the previous month, (<https://nairametrics.com>, 2022). The highest increase was recorded in prices of gas, liquid fuel, solid fuel, and garments, passengers travel by road and by air, and the core sub-index increased to 1.56% in June 2022, (www.thisdaylive.com, 2022). This is down by 0.31% when compared to 1.87% recorded in May 2022 (www.thisdaylive.com, 2022). This implies that the Nigerian inflation rate has surged to its highest level in over 5 years largely as a result of the hike in prices of energy and food, thus eroding their purchasing power.

The rise in transportation costs caused by the scarcity of petrol in most cities across the country has also affected commodity prices and the welfare of the farmers. Thus, though Nigeria may have survived the projected deadly health effects of the novel coronavirus disease 2019 (COVID-19), its negative socioeconomic implications for the economy remain obvious. Bitler *et al.*, (2020) and Njatang, (2021) stated that COVID-19 effects on the economy could be widespread. Teachout and Zipfel (2020), reported that 80.4 million people (9.1%) would have been added to the poverty list as a result of the COVID-19 pandemic.

The emergence of the COVID-19 pandemic globally has introduced distortion into the economy. The economies of nations have shortfalls in the supply of goods and services due to restrictions imposed on the movement of human and material resources needed for production. Preventive protocols adopted by each government, especially where restrictions were put to avoid personal contact with a victim who had already contracted the virus, partial market closures, and lockdowns resulted in an excessive increase in the prices of commodities. This increase in commodity prices has adverse effects on farming households. Therefore, there is the need to assess the effects of the pandemic on commodity price volatility and the welfare of farming households. Samuel *et al.* (2021), (UNSCN 2020), and World Food Programme, (2020), worked on the impact of the pandemic on unemployment and food prices in sub-Saharan Africa. Swinnen and Vos (2021), Nchanji *et al.* (2021), and Boughton *et al.* (2021) worked on food systems and household welfare. Adopt and Micale (2021), however, carried out a study on commodity prices but the study failed to look at the individual price increase of some specific commodities. But this study aims to specifically identify some commodities that were affected by the lockdown measures during the covid-19 outbreak as well as assess its impact on the welfare of farming households in Nigeria.

The broad objective of the study is to assess the effects of the Covid-19 pandemic on commodity price volatility and the welfare of farming households in Nigeria. While the specific objectives are to; compare the prices of some commodities before and during the pandemic; estimate the percentage change in the prices of some commodities during the pandemic and compare the real income of farming households before and during the pandemic in Nigeria. Covid-19 affected household food security in Nigeria. Before the lockdown, households that could afford to stock up on food staples purchased more than usual. This stockpiling in addition to partial market closure and lockdowns drove prices up in regions where supply was limited. The study will guide the government and policymakers to establish price control bodies that

will oversee the prices of commodities during an outbreak of a pandemic in the near future. The study will also make rural farming households establish food banks in the respective communities.

Materials and methods

Nigeria is located in West Africa with its national capital in Abuja with a coast on the Gulf of Guinea and the Atlantic Ocean. It has a diverse geography with climates ranging from arid to humid equatorial. It lies between longitudes 3° and 14° and latitudes 4° and 14°. It has a land mass of 923,768 sq. km. it is bordered to the north by Republic of Niger and Chad; it borders to the west with the Republic of Benin while the Republic of Cameroon shares eastern borders right down to the shores of the Atlantic Ocean which forms the southern limits of Nigerian Territory Nigeria consists of plateaus and the lowlands between them, which major river basins are fed especially by the Niger River. It has a developing mixed economy based largely on petroleum production and agriculture. Majority of the Nigerian population in the rural area engaged in agricultural activities.



Fig. 1. Map of Nigeria showing the geographical location. (Sourced, Xinhua News Agency 2019).

Data Collection

The study was based on secondary data. Data was collected from the Central Bank of Nigeria publication, World Economic outlook, and the World Bank Report, from 2010 -2022 and forecasts from 2023-2026 respectively. (<https://www.statistics.com>, (2022).

The data consist of prices of some food items and GDP per capita (income per person) before and during the Covid-19 pandemic. A similar method was adopted by Amare, Abay, Teberti and Chamberlin, (2021), where secondary data was used to analyze the

impact of covid-19 pandemic on household food security and labour market participation outcome in Nigeria. The study was able to identify that covid-19 pandemic outbreak affected the farming household welfare in Nigeria. However, the study used the same methods to analyze the trend of commodity price volatility in Nigeria before and during the pandemic.

Data Analysis

Time- response graph and Autoregressive Moving Average (ARMA) was used to analyze the trend of the inflation rate, descriptive tables-test statistics were used to test the relationship between the real income of farming household before and during the covid-19 pandemic. This methods was in line with the one adopted by Ahmed and Mubarak, (2020), where he used time response graph to analyze the impact of lockdown on small scale businesses.

Results and discussion

Prices of Some Commodities before and during the Covid-19 Pandemic in Nigeria. Although covid-19 outbreak started in the Wuhan province of China, it had adverse effects on rural farming households and the livelihoods of other Nigerians.

It's known to have thrown many into abject poverty because of excessive rises in the prices of commodities, weak institutions that were ineffective in responding to the pandemic, and the lack of adequate social welfare programs that would have catered for the majority of the farming household and the poor citizens who were affected by the crisis.

The fear of financial and economic collapse brought about by the pandemic led to so many indices that negatively affected the prices of commodities, the rural farming household, and the economy at large.

Such indices are panic, buying and hoarding of goods by individuals and businesses mostly for speculative reasons, flight to safety in investment and consumption, households stocking up on essential food and commodity items, and businesses asking workers to work from home to reduce operating costs.

Table 4.1. Prices of Some Commodities before and during the Covid-19 Pandemic in Nigeria.

Food Commodities	Base line/ Pre-COVID-19 Prices	Post-Lockdown Prices	Difference
Agric. Eggs (medium size) per create	# 1,100.00	#2200.000	#1100.00
Beans brown (Per painter	#700.00	#2500.00	#1800.00
Beans (White black eye)	#600.00	#2200.00	#1600.00
Beef bone in kg	#700.00	#1500.00	#800.00
Beef boneless	#1000.00	#2000.00	#1000.00
Frozen chicken in kg	#1400.00	#2500.00	#1100.00
Catfish fresh 1kg	#880.00	#3300.00	#2420.00
Catfish dried	#500.00	#1500.00	#1000.00
Bread sliced 500kg	#500.00	#800.00	#300.00
Bread unsliced 500g	#400	#650.00	#250.00
Ofada rice (broken) 1 painter	# 650.00	#3000	#2350
Golden penny spaghetti per sachet	#200.00	#550.00	#3500
Indomie per carton	#2250.00	#5850.00	#3600

Source (market survey 2022)

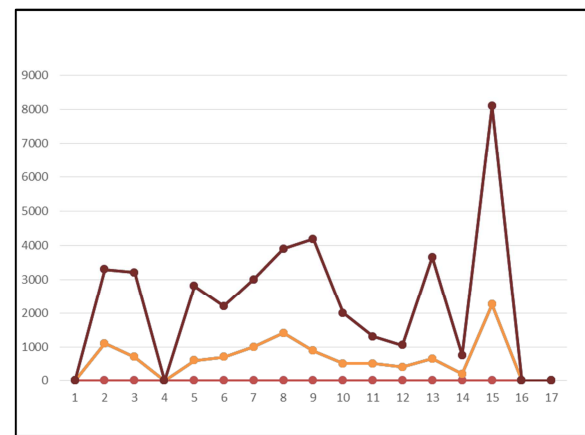


Fig. 1. Trend in prices of Commodities before and during the Pandemic.

Table 4.1 and Fig.1 present the trend of prices of some commodities such as agric. eggs, brown beans, white beans, beef, frozen chicken, catfish fresh and dried, bread, ofada rice, golden penny spaghetti, and indomie noodles before and during the covid-19 pandemic era. Data in the table and fig. reveals a fluctuating trend in the prices of these commodities from #1100, #700, #1000, #1400,#880,#550,#400, #650, #200, and #2250 respectively before the Covid-19 pandemic, but during the pandemic, it was

observed that the prices of these commodities doubled to #1500, #2000, #2500, #3300, #1500, #800, #800, #650, #3000, #550, #5850. This result showed that the pandemic affected the living standard of farming households in Nigeria. This is in line with Ayawa *et al.* (2022), which stated that the pandemic has a devastating effect on the citizens in developing countries, but his study did not capture the price difference between some commodities before and during the pandemic.

Table 4.2. Percentage Change in the Prices of some Commodities in Nigerian Market.

Food Products	Percentage Change in prices%
Agric eggs (Medium size)	28%
Beans brown	30.22%
Beans (white black eye)	40.07%
Beef bone 1 kg	44.32%
Beef boneless 1kg	31.67%
Bread sliced 500g	36.83%
Bread unsliced 500g	35.31%
Broken rice (Ofada)	34.65%
Catfish fresh 1kg	8.75%
Catfish dried 1kg	25.65%
Frozen chicken 1kg	

Source: (Market Survey 2022)

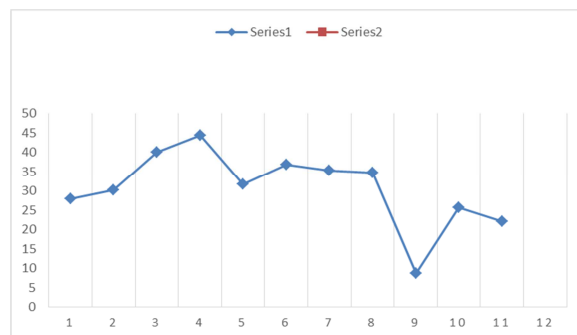


Fig. 2. Percentage change in the prices of commodities during the pandemic.

Table 4.2 and fig. 1 present the percentage change in the prices of some commodities during the pandemic. The direct impact of COVID-19 and measures taken by the Nigerian government to reduce the effect of the pandemic had a substantial impact on commodity markets and supply chains. Prices of most major commodities have risen since April 2020, when the pandemic was discovered in Nigeria and since then commodity prices have been on a continuous increase. This is in line with Paul and Chowdhury

(2020), Teachout and Zipfel (2020), and Enwa and Ewuzie (2020), whose work showed that COVID-19-induced lockdown affected food systems directly through its impacts on food supply and demand. But the previous literature fails to look at the impact of covid-19 on the living standard of rural farming households in Nigeria.

Table 4.3. Showing Inflation Rate before and during the Pandemic in Nigeria.

Year	Inflation Rate%	Annual Change
2010	13.73%	1.17%
2011	10.84%	-2.88%
2012	12.22%	1.38%
2013	8.48%	-3.74%
2014	8.66%	-0.41%
2015	9.01%	0.95%
2016	15.68%	6.67%
2017	15.52%	0.85%
2018	12.09%	-4.43%
2019	11.40%	-0.70%
2020	13.25%	1.85%
2021	16.95%	3.71%
2022	16.98%	-3.81%

Source: (World Bank Report 2021)

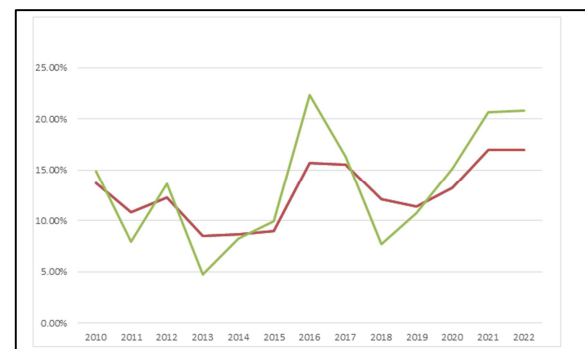


Fig. 3. Trend Analysis on Inflation Rate and Annual change.

Table 4. 3 and fig. 3 reveals the trend of inflation rate before and during the covid-19 pandemic, from 2010 to 2022, the trend show a dwindling inflation rate. In 2015, 2016 and 2017, it shows that inflation rate went as high as 15.68%, 15.52% and 12.09% as a result of demand pull inflation and government policies at that time. But after that period, the inflation rate decline to about 11.40%. During the pandemic era, Nigeria experienced an excessive rise in prices of goods and services as a result the lockdown and restriction resulted to excessive increase in the price of consumer goods as trade borders were closed and inter-state

travels where banned which disrupted the distribution of consumer goods across the country. This study is similar to the study carried out by Ageyi *et al.* (2021), Enwa and Ewuzie (2020), although their study investigated the impact of Covid-19 pandemic on food prices such as on maize, imported rice, sorghum and local rice in sub-Saharan African countries and welfare provisions to farmers in Ecowas countries and found out that restrictions on movements and lockdowns in the wake of Covid-19 was associated with an increase in the price of maize only, while exchange rate, inflation and crude oil prices were responsible for the prices of imported rice, sorghum and local rice in the developing countries. But this study investigated how the pandemic has affected the prices of beans, eggs, bread etc. within Nigeria context only.

Table 4.4. Showing the International Monetary Fund Forecast of Inflation Rate for 2023, 2024, 2025 and 2026.

Year	Inflation
2023	13.10%
2024	11.60%
2025	11.50%
2026	11.50%

Source: (<https://www.statistics.com> (2022))

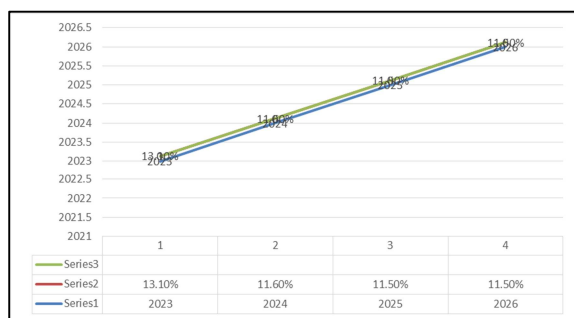


Fig. 4. Trend of Inflation rate forecast for 2023-2026 in Nigeria.

Table 4.4 and Fig.4 reveal the inflation rate before Covid-19 and during the pandemic. The inflation rate as projected by the International Monetary Fund (IMF) showed that Nigeria will continue to experience a rise in the rate of inflation. In 2023, the inflation rate will be at 13.10%, for 2024, 2025, and 2026, the inflation rate will be as high as 11.50% respectively. This implies that Nigeria's economy and farming

households will still experience a high inflation rate and a worsening economic situation for rural farming household welfare if urgent action is not taken to curb the continuous increase in the rate of inflation. Ahmed and Mubarak (2020) reported that over time, lockdowns disproportionately affected the poor and daily wage earners. Even before the COVID-19 crisis, the low income of farmers was a critical issue in Nigeria. This work has given us an idea of the future, and immediate action must be employed to tackle the menace.

Table 4.6. Showing the Inflation Rate and Real Income of Farming Household in Nigeria.

Inflation rate	Real income in naira
13.73%	186,343
10.84%	214,607
12.22%	264,217
8.48%	263,697
8.66%	307,487
9.01%	265,801
15.68%	283,852
15.52%	297,487
12.09%	318,960
11.40%	307,095
13.25%	180,000
16.95%	202,658
16.98%	228,496

Source: (World Bank 2021).

Table 4.7. Compare the relationship between the real income of farming household before and during the pandemic.

	N	Mean	Std. Deviation	t-Value
Real Before IncomePandemic	10	433,749.6667	56362.8157	
In During NigeriaPandemic	3	268,854.6000	31010.72496	4.61

The result shows that there is a significant difference between the real income of farming households before and during the pandemic and a continuous rise in the prices of commodities which indicated that farmers' consumption is influenced by inflation. Inflation has increased the prices of goods and services. It decreases the real purchasing power of the rural farming household. The higher the inflation rate the lower the purchasing power of farming households. Conversely, a lower inflation rate means a decrease in the prices of goods and services. Lower prices of goods and services had an impact (increase)

on farmers' purchasing power. The inflation during the pandemic harmed the purchasing power, thereby affecting their welfare. This study agrees with the study conducted by Zou (2011), which said that inflation is a major cause of social and economic instability, but did not capture the rural farming household welfare before the pandemic.

Conclusion

This study showed that the outbreak of the novel virus (COVID-19) pushed governments of different countries, including Nigeria, to implement specific safety measures (such as lockdowns, self-isolation or quarantine, and social distancing). Evidence shows that these measures, especially the lockdown order and partial market closures, resulted in an excessive rise in the prices of commodities which has a negative effect on the livelihood and income of farming households in Nigeria. The coronavirus disease and lockdown are a threat to all the core segments of food security (availability, accessibility, affordability, stability, and utility). It also revealed that the real income of farming households before the pandemic was higher than the income during the pandemic, and their livelihood was threatened. Similarly, the study found that COVID-19 lockdowns affect the availability and accessibility of food.

Recommendation(S):

The study recommends that;

- The small-scale farming household should get an off-farm job or business to create multiple streams of income to meet up with their demands
- Future studies can also examine the impact of the coronavirus pandemic on other macroeconomic indicators in Nigeria.
- The government of Nigeria should cut down on unessential spending and re-direct resources towards the Covid-19 response.
- Price controls should be put in place to manage the affordability of goods and services on the market

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