

# An Empirical Analysis of the Relationship Between Covid-19 Pandemic and Exchange Rates in Nigeria

**Bakari Wadinga**

[bakarihildi@yahoo.com](mailto:bakarihildi@yahoo.com)

Department of Economics, Adamawa State University, Mubi

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## **Abstract**

*This study examines the relationship between Covid-19 and exchange rates in Nigeria. The Covid-19 pandemic has been globally recognized to have affected almost all facets of human activities including financial transactions and international exchanges. This resulted in high cost of dollars and other foreign currencies such as pounds relative to Nigerian currency, naira and the Central Bank of Nigeria had to devalue Naira during the Covid-19 period. It is against this background that this study examines the relationship between Covid-19 and exchange rates in Nigeria because little or no attention was given to empirically investigate such relationship. Therefore, the objectives of the study were to examine the relationship between Covid-19 pandemic and exchange rate and the effect on Covid-19 on exchange rate in Nigeria. Daily data on the buying and selling rates of naira relative to dollars were collected from the CBN while daily data on confirmed and recovery cases of Covid-19 were obtained from the Nigeria Centre for the Control of Disease (NCDC). The study used correlation and regression analysis to analyse the data. The study finds a negative relationship between Covid-19 and exchange rate and the effect of Covid-19 on exchange rate was found to be negative and statistically significant. The study recommends among others that the government should take measures to reduce pressure on the dollars especially during the Covid-19 pandemic period.*

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**Keywords:** Covid-19 Pandemic, Exchange Rate, Selling Rate of Dollars, Buying Rate of Dollars, Naira, Nigeria

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## **1. Introduction**

The novel Coronavirus Disease 2019 (COVID-19) found in Wuhan, China, was deemed a severe public health issue by the World Health Organisation (WHO) on March 11, 2020 (Wong et al., 2020). This is similar to the "Spanish" influenza pandemic that killed 455,000 people worldwide between 1918 and 1920 (Johnson & Mueller, 2002; Gewald, 2007). As of the 28th of February 2021, COVID-19 has spread across the world with 113,950,840 cases and 376,320 fatalities. In Africa, there were 1,513,393 cases and 49,993 fatalities, while Nigeria had 155,417 cases and 17 fatalities (WHO 2021; Nigeria Centre for Disease Control (NCDC), 2021).

The epidemic disrupted operations in the lives of individuals and companies throughout the world. People inference based on Wong et al. (2020) research found that during COVID-19 pandemic, there was a substantial impact on workers' stress level due to a lack of workplace regulation and insufficient workplace safety equipment. In a similar line, Shah et al. (2020) claim that governments and health organisations place little emphasis on labour and instead concentrate on COVID-19 prevention and management. Public health

and economic hardship are both reflected in the corona virus outbreak. While the public health crisis focuses on illness containment strategies, treatment, and vaccine research, economic problems are represented in labour disruption, supply and demand shocks, as well as shocks to the oil price, as a result of interruptions in economic activity brought on by the national lockdown resulting in decline in the value of local currency in Nigeria.

The implementation of important socioeconomic policies throughout the nation and the world has therefore been hampered by the corona virus pandemic. Nigeria had experienced a variety of labour market issues prior to the COVID-19 epidemic, including high rates of young unemployment, growing informal economy, and restricted access to social safety programmes. There may be further repercussions on economic activity owing to decreased levels of consumption and investment if policy steps to alleviate the impact on the labour market and family incomes are not taken.

This might lead to a lengthy recession and worsen inequality and poverty. According to a recent UNDP estimate, if lockdown measures are implemented countrywide (not necessarily at the same time) for three months, up to 13 million people might lose their jobs (temporarily), the bulk of whom would be in the unorganised sector (Ozili, 2020). The world economy was devastated by the COVID-19 pandemic as employers in both big and small enterprises confront a terrible dilemma regarding whether to lay off employees, reduce their hours, or make them redundant. The ILO is the global labour organisation estimates that the loss of the equivalent of 400 million full-time jobs was anticipated in the second quarter of 2020 (ILO, 2020).

The nation's and the world's economies have both been significantly impacted by the COVID-19 pandemic (Ozili & Arun, 2020). Global commerce, national health care systems, the food and event industries, as well as education and international travel, were all impacted. Nigeria's currency is one of the variables that have been most impacted by the Covid-19 pandemic as a result of globalisation.

Many people, companies, and the value of the Naira in relation to other currencies have suffered as a result of the Covid-19 pandemic. The Naira has been devalued by the Central Bank of Nigeria throughout the Covid-19 era, and this issue, along with others of a similar kind, is of great concern to people, companies, and decision-makers.

Despite the worries brought on by the Covid-19, there haven't been many empirical investigations done to look at the connection between the pandemic and the exchange rate in Nigeria. This research aims to investigate this link and assess how Covid-19 affects the exchange rate in Nigeria. In line with this, the following research issues are addressed by this study. What connection exists between the Covid-19 epidemic and Nigeria's exchange rates? What impact does the Covid-19 epidemic have on the Nigerian CBN's exchange rate for dollars? What impact does the Covid-19 epidemic have on the Nigerian CBN's selling rate of dollars?

Since exchange rates have a significant impact on practically everyone, the significance of this research is obvious. It is of utmost significance to travelers and enterprises worldwide, academics and decision-makers. The study provides economic decision-makers with the expertise and abilities required to respond appropriately to the urgent problem of exchange rates in the country. This study is organised into introduction, literature review, methodology, results and discussion, as well as conclusion and recommendation.

## **2. Literature Review**

Ahmed and Buheji (2020) hypothesised that (CO V ID-19) is a human right as well as a medical battle regardless of historical national divisions, the outbreak should be fought as an enemy. The emergence of the coronavirus presents a chance to update corporate strategies by incorporating goodwill and value into company models and contracts of employment by reassessing moral and openness concerns to create new contractual relationships owing to changes in attitudes and behaviours brought on by the shock virus (Atilola, 2020). According to Prem, et al. (2020), the

extraordinary steps taken to slow down measures include the establishment of physical and social distance during the COVID-19 epidemic.

According to Venkatesh and Shantal (2020), physical barriers should be put in place to lessen the lethal effects of COVID-19 on individuals. On the contrary, Ezenwile (2020) said that personal behavioural modification could prevent. Onah, Ezebuilo, and Ojiakor (2016) argue that the rise of COVID-19 increased social and physical distance, endangering the survival of this society. Coronavirus, according to Buheji and Ahmed (2020), provides the chance to examine how people live in order to stop the spread of viruses, due to the fact that this pandemic would result in more inventive advancements, not just in the needs and services for medical care, but also in all areas of life which includes how people interact at work.

Taylor (2020) supports that assertion. using advanced technical tools to operate over the internet has become the new-normal despite the physical distance measurement leading to a new standard working method, out of sight, out of mind dilemma will stop teamwork and constructive conversation.

Olapegba et al. (2020) evaluate Nigerians' understanding of and attitudes towards COVID-19. They discover that several Nigerians were unaware of COVID-19 when it was first revealed and due to their misperceptions, they were unable to take full preventative actions. According to Jacob et al. (2020), the COVID-19 pandemic impacted educational institutions via the closure of institutions and the decline in foreign education in Nigeria, interruption of the higher education calendar, cancellation of local and international conferences, gaps in teaching and learning, and a manpower shortage in financial cuts for higher education and educational institutions. Adegboye (2020) study the early COVID-19 transmission in Nigeria and demonstrate that the cases of COVID-19 in Nigeria were less common than anticipated. Maijamaa and Adenomom examine the effects of COVID-19 on the Nigerian stock market from the perspective of (2020) from January 2, 2020, to April 16, 2020. The findings showed a decline in stock returns and significant stock return volatility in Nigeria during the COVID-19 timeframe.

The COVID-19 pandemic had two effects on the world economy. The first is the direct effect where the virus's spread promoted social withdrawal, which resulted in the closure of corporate buildings, enterprises, and events, among others. The second is the indirect effect which intensify the speed at which the infection was spreading, and the situation's severity potentially lead shrink in consumer spending and investment by investors (Ozili & Arun, 2020).

The COVID-19 pandemic spread and had effect primarily in five different ways. One of the effects of the COVID-19 outbreak on borrowers' ability to service the loans they made, which resulted in non-performing loans (NPLs), which decreased banks' profits and ultimately harmed the stability and soundness of institutions. Subsequently, as more and more borrowers sought out loans, banks were hesitant to provide them. Borrowers found it difficult to repay the loans made to them during COVID-19 outbreak. Secondly, there were shocks to the oil demand, which were reflected in the drop in the price of oil at the international market. The reduction in the crude oil price which fell from around US\$60 per barrel to as little as US\$30 in March, per barrel was the most obvious and immediate consequence. People stopped travelling during the outbreak, and this caused the demand for aviation fuel and car gasoline to drop consistently, which impacted Nigeria's net oil income, which in turn had an impact on the country's foreign exchange reserves.

Thirdly, as many importers closed, there were supply shocks in the global supply chain especially China, shut down their manufacturing and fortified their borders (Adegboye et al.2020). Nigeria

suffered greatly as a result since it is an import-dependent country. Nigeria therefore experienced a lack of essential commodities from China, including pharmaceuticals, spare parts, and completed items. Fourthly, the national budget also suffered. The basic budget was created using an oil price 57 dollars per barrel. The drop in oil prices during the pandemic to US\$30 per barrel caused the budget to become out of date, necessitating the creation of a new budget, which was necessary because of the low price of oil (Adenomon & Maijamaa, 2020).

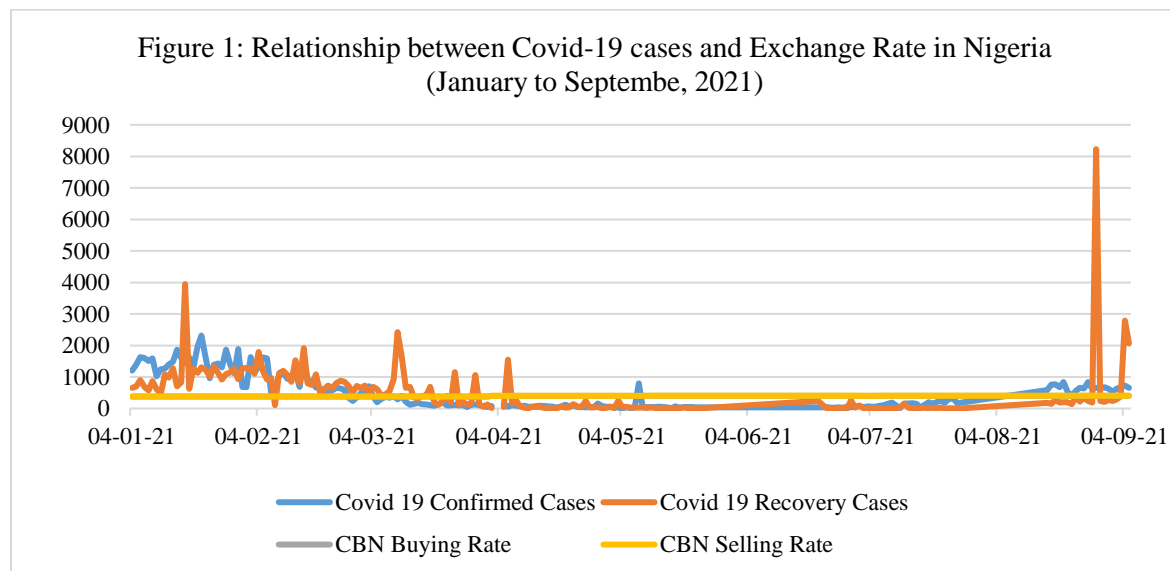
Lastly, the Nigerian stock market was impacted by the COVID-19 pandemic. Majorly, when investors withdrew their money from the stock market, market indexes fell sharply. investments made in 'safe haven' assets like US Treasury bonds. In less than three weeks after the first instance of covid-19 case in Nigeria, investors lost more than NGN2.3 trillion (US\$5.9bn) (Adenomon & Maijamaa, 2020).

### 3. Methodology

This study used daily data obtained from the CBN statistical bulletins and the National Centre for Disease Control (NCDC). The data on exchange rates was sourced from CBN while the data for Covid-19 cases was obtained from the NCDC. Both the CBN purchasing and selling rates of dollars in Nigeria for the period of 2021 were used in the analysis. For the Covid-19 cases, the study used confirmed and recovery cases of Covid-19 in 2021 for the analysis.

### 4 Results and Discussion

Graphical presentation of data has been done in order to have a visual insight into the trends and patterns of the Covid-19 confirmed cases, the Covid-19 recovery cases, the CBN buying rate and the CBN selling rate of dollars during the sample period.



Source: Author's Plot using Data from CBN and NCDC (2021)

Figure 1 provides the relationship between Covid-19 cases and exchange rates in Nigeria using Covid-19 confirmed cases, Covid-19 recovery, CBN buying rates of dollars and CBN selling rates

of dollars. The figure depicts rising cases of confirmed Covid-19 at the beginning of 2021 especially in early January with high number of recovery around early February and mid-March of 2021. The number recovery has significantly risen in the mid and late September as can be observed from the trend in the figure 1. The graph shows that both the buying and the selling rates of dollars by the CBN have been increasing very slowly during the Covid-19 pandemic although the prices of dollars at the parallel market have been rising throughout the period.

**Table 1: Summary Statistics for the relationship between Covid-19 and Exchange Rate**

	<i>Covid-19 Confirmed Cases</i>	<i>Covid-19 Recovery Cases</i>	<i>CBN Buying Rate</i>	<i>CBN Selling Rate</i>
Mean	480.762	497.273	392.491	394.037
Median	185	207.5	401.8	403.8
Mode	35	8	380	381
Standard Deviation	541.868	803.719	11.420	11.918
Sample Variance	293621.736	645964.759	130.421	142.062
Kurtosis	0.462	45.39895511	-1.980	-1.981
Skewness	1.220	5.38871299	-0.183	-0.183
Range	2312	8228	23.27	24.27
Minimum	2	0	380	381
Maximum	2314	8228	403.27	405.27
Sum	93268	96471	76143.34	76443.34
Count	194	194	194	194

Source: Author's computation using Excel 2016.

Table 1 presents the summary statistics for the Covid-19 confirmed cases, Covid-19 recovery, CBN buying rate and CBN selling rate of dollars. The result shows that the average value of Covid-19 confirmed cases and recovery are 481 and 497 respectively during the period while that of CBN buying and selling rates are 392 and 394 respectively.

The median values are 185, 297.5, 401.8 and 403.8 for the Covid-19 confirmed cases, recovery, CBN buying rate and CBN selling rate respectively. There is a huge variation within the observations as indicated by both the standard deviation and sample variance. While the Covid-19 confirmed and recovery cases are shown to be right skewed, the CBN buying and selling rates are skewed to the left. The kurtosis indicates that Covid-19 is peaked and skewed to the right. The minimum values are 2 and 0 for the Covid-19 confirmed and recovery cases respectively while the maximum values are 2314 and 8228 for confirmed and recovery cases respectively.

**Table 2: Correlation between Covid-19 and Exchange Rates in Nigeria**

	<i>Covid 19 Confirmed Cases</i>	<i>Covid 19 Recovery Cases</i>	<i>CBN Buying Rate</i>	<i>CBN Selling Rate</i>
Covid 19 Confirmed Cases	1			
Covid 19 Recovery Cases	0.476727961	1		
CBN Buying Rate	-0.566163725	-0.386956939	1	
CBN Selling Rate	-0.566379822	-0.387134028	0.999998579	1

Source: Author's computation using Excel 2016.

The result in table 2 shows that correlation between Covid-19 confirmed cases, Covid-19 recovery, CBN buying rate and CBN selling rate of dollars. The result of the correlation analysis indicates that there is a positive relationship between confirmed cases of and recovery from Covid-19 pandemic. This means that high number of confirmed cases is associated with high number of recovery.

The correlation between CBN buying rate of dollars and confirmed cases is negative indicating an inverse relationship. This implies that when Covid-19 confirmed cases increase, the CBN buying rate of dollars decreases. Similarly, there is a weak negative relationship between CBN buying rate and Covid-19 recovery.

In the same vein, the result shows evidence of a strong negative correlation between CBN selling rate and Covid-19 confirmed cases as well as between CBN selling rate and Covid-19 recovery. The result indicates that the higher the Covid-19 confirmed and recovery cases, the low the CBN selling rate.

The correlation between the CBN buying and selling rates of dollars appear to be strongly positive with a correlation coefficient of 0.999 indicating that higher selling rates are associated with higher buying rates. This signifies a positive relationship between the demand for dollars and price of dollars in Nigeria. The higher the demand for dollars the higher the prices of dollars.

**Table 3: Result of the Regression Analysis**

<b>Dependent variables:</b>	<b>CBN Buying Rate</b>	<b>CBN Selling Rate</b>
Constant	400.3808792*** (0.949273564) [421.7760763]	398.5667*** (0.909735) [438.1127]
<b>Independent Variables</b>		
Covid-19 Confirmed Cases	-0.01086872*** (0.001472538) [-7.380941292]	-0.01041*** (0.001411) [-7.37691]
Covid-19 Recovery Cases	-0.002247793** 0.000992788 -2.264122461	-0.00215** (0.000951) [-2.26223]
Multiple R	0.581841094	0.581611
Adjusted R	0.331612766	0.331343

Observations	194	194
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Source: Author's computation using Excel 2016. Note that \*\*\* and \*\* represent statistical significance at 1% and 5% levels respectively. Values in () are the standard errors while values in [] are the t-statistics.

Table 3 presents the results of the regression analysis of the effect of Covid-19 pandemic on exchange rates in Nigeria. Two different regression analyses have been conducted to test the effect of Covid-19 on CBN buying rate and CBN selling rate of dollars. The results show that the CBN buying and selling rates are positive as indicated by the constant terms 400.380 and 398.566 in columns 2 and 3 respectively when Covid-19 confirmed and recovery cases are zero. Both the values of the constant are statistically significant at 1% level with high values of t-statistics.

The effect of Covid-19 confirmed cases on CBN buying rate appears to be negative as indicated by the coefficient -0.01086872 and this value is statistically significant at 1% level. This result shows that on average, when number of Covid-19 cases increases by 1, the CBN buying rate decreases by ₦0.01086872, holding other factors constant. Similarly, on average, when the number of recovery from Covid-19 decreases by 1, the CBN buying rate increases by ₦0.002247793, holding other factors constant.

The effect of Covid-19 confirmed cases on CBN selling rate is negative and statistically significant at 1% level. It shows that on average, for every 1 person increase in Covid-19 confirmed case, the CBN selling rate of dollar increases by ₦0.0104, holding other factors constant. In the same vein, the effect of Covid-19 recovery on CBN selling rate is negative and statistically significant at 5% level. This indicates that on average, for every 1 person recovered from the Covid-19, the CBN selling rate decreases by ₦0.00215, holding other factors constant.

The multiple and Adjusted R squared indicate that 33% to 58% of the variations in CBN buying and selling rates are explained by the Covid-19 confirmed cases and recovery. This means Covid-19 has contributed significantly towards fluctuations in Naira –Dollar exchange rate. Based on this, exchange rate fluctuation was also affected by other factors which contributed to more than 40% of the variations.

## 5. Conclusion and Policy Recommendation

This study examines the relationship between Covid-19 pandemic and exchange rate in Nigeria using data on Covid-19 confirmed cases as well as Covid-19 recovery cases and also data on CBN buying and CBN selling rate of dollars. The Naira value was compared against the dollar for the period of 194 days. The daily datasets were obtained on both the Covid-19 and dollar exchange rates during the period of the study. The study employs descriptive analytical technique, the correlation as well as the regression techniques. For the regression analysis, Ordinary Least Squares (OLS) method was used. The result of the correlation analysis reveals that Covid-19 confirmed and recovery cases are negatively correlated with CBN buying and selling rates of dollars during the period of the study. Similarly, Covid-19 confirmed cases have shown to have negative and statistically significant effect on exchange rate for both CBN buying and CBN selling rates of dollars.

Based on the findings of this study, the government is hereby recommended to take measures that will discourage high demand for dollars especially during the Covid-19 pandemic period so as to

reduce pressure on the dollar. Diversification of the economy will also go a long way in reducing pressure on the dollar.

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