



## An Empirical Investigation of the Effect of the Covid-19 Index on Foreign Direct Investment in Nigeria

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*This study is an empirical investigation of the effect of the covid-19 index on foreign direct investment in Nigeria. The specific objectives of the study are to access the effect of covid-19 shocks index on foreign direct investment (FDI) in Nigeria, ascertain the effect of covid-19 vaccine index on foreign direct investment (FDI) in Nigeria and determine the effect of covid-19 uncertainty index on foreign direct investment (FDI) in Nigeria. The outbreak of coronavirus also known as COVID-19 towards the end of year 2019 disrupted the Nigerian economy. The Shocks of the Covid-19 pandemic have been widespread and have disproportionately affected vulnerable sections of the population, including children and their families. According to the World Bank, the shocks of the COVID-19 (coronavirus) pandemic and its economic and social influences on every Nigerian have created an urgent need for a timely study to help monitor and mitigate Covid-19 shocks for Nigeria's well-being, especially for multinational companies home and abroad. In this context, this study utilizes the new measures of Covid-19 indexes as proposed by Narayan et al. (2021) which include the Covid Index (CI), Vaccine Index (VI) and Covid-19 Uncertainty Index (UI) to measure Covid-19 shocks, while the foreign direct investment (FDI) was measured with net inflows (BoP, current US\$) with exchange rate (EXR) and inflation rate (INFR) as control variables. The findings emanating from the research show that Covid-19 shocks have a negative and significant influence on foreign direct investment in Nigeria. The study therefore recommends that the federal government should build a post COVID-19 diversified economy that will expand the country's access to foreign market so as to have variety of commodities to trade in the foreign market.*

↑  
**ABSTRACT**

**Keywords:** Covid-19 Pandemic; Covid-19 Index; Foreign Direct Investment

## **Introduction**

The novel corona virus notably referred to as COVID-19 has greatly impacted the economies of the world in ways that have never been experienced since inception. It is indisputably one of the most devastating global events in recent history which have been affecting every aspect of daily life. The undesirable effect of coronavirus on economies of nations universally and indeed the developing countries has drawn much attention across the globe, and even Nigeria in particular. Zambrano-Monserrate, Ruano, and Sanchez-Alcalde (2020) examined the effects of COVID-19 on several dimensions of economic life, inter alia environmental quality, following the number of countries affected (216 countries) and the number of cases (17,300,000 confirmed cases and 673,822 deaths on July 31). This causalities have continued to occur in geometrical progression for a long period of time before the COVID-19 vaccines were invented to prevent deaths in various countries and territories from 8<sup>th</sup> December, 2020 (Gillingham, Knittel, Li, Ovaere, and Reguant, 2020).

The COVID-19 pandemic which first broke out in China was discovered in Nigeria on 27<sup>th</sup> February, 2020. The Nigerian Centre for Disease Control (NCDC) recorded 41,804 cases as of 28<sup>th</sup> July 2020, out of this number 18,704 were discharged and 868 deaths. This resulted to global lockdown that led to a sharp drop in the inflow of foreign direct investment (FDI) in the country. The outbreak of the Covid-19 pandemic has unfortunately left both the inflow and outflow of foreign direct investment in a major economic shock which has curtailed activities in all sectors of the economy so as to prevent the spread of the virus (Lain and Vishwanath, 2021). The covid-19 pandemic has signalled a deep economic recession in Nigeria, which have hit hard on key major sectors of the economy such as the service, manufacturing, education and industry sectors. The extensive economic containment measures imposed by the federal government restricting the movement of people, goods and services is another major contributor to the adverse economic effect (World Bank, 2021). The restraint extends beyond international markets, as goods and services can no longer move in and out, firms, industries and companies, especially foreign-owned ones, have been unable to produce as most of their raw materials are sent from abroad, while those that relied on domestic raw materials for production can barely get it. Subsequently, production and distribution rates have been reduced and foreign direct investment flows have been barricaded to limit the movement of people, goods and services aimed at curbing the spread of the Covid-19 disease in the country. Consequently, this measure has affected the living conditions of Nigerians as markets where goods and services are sold and bought are disrupted, Nigerian borders have been closed, prices of goods and services have been increased and human capital, people's livelihoods and welfare have been greatly affected because of the drastic measures taken by the government to address the Covid-19 crisis in the country. Foreign direct investment is often sensitive to economic and various other types of shocks.

For instance, Obayomi (2020) posited that there was also a decline in the global demand for oil necessitating a drastic fall in its price and this affected Nigeria's major foreign export (crude oil) that contributes 70 and 90 percent to government revenue and foreign exchange earnings respectively over the years. This therefore led to the National Assembly amending the 2020 budget, lowering the benchmark of oil price to \$28 per barrel from the \$57 earlier passed by the lawmaking body (Akinpelu, 2020). To cushion the effect of COVID-19 on the economy, Chinery, Sayne and Gillies (2020) revealed that the Nigerian government is seeking \$11 billion in fresh loans from the International Monetary Fund (IMF), domestic banks, the World Bank and others which would unfortunately grow the debt stock of the country by close to another 50 percent. Chinery et al (2020) also contend that, the start of the global lockdown occasioned by COVID-19 in February, 2020 halved foreign remittances in the country, which formerly gave local businesses far more capital than did oil and foreign aid. Beside this, prospects for new foreign direct investments which Todaro as cited in Andza and Agu (2018) argued, "does not only alleviate part or all of the deficit on the balance of payments current account but can also function to remove that deficit over time if the foreign-owned enterprise can generate a net positive flow of the export earnings". This implies that FDI are currently weak in the country given the trend of the COVID-19 pandemic in the world. There are also dearth of literature on this study area. It is against this backdrop that this research is carried out to empirically investigate the effect of COVID-19 index on foreign direct investment (FDI) in Nigeria and its implications for development in the country.

The main objective of this study is to empirically investigate the effect of COVID-19 index on foreign direct investment (FDI) in Nigeria.

**The specific objectives are to:**

- i. Access the effect of covid-19 shocks index on foreign direct investment (FDI) in Nigeria
- ii. ascertain the effect of covid-19 vaccine index on foreign direct investment (FDI) in Nigeria
- iii. determine the effect of covid-19 uncertainty index on foreign direct investment (FDI) in Nigeria

**The following research questions guided the study:**

- i. To what extent has covid-19 shocks index affected foreign direct investment (FDI) in Nigeria?
- ii. What is the effect of covid-19 vaccine index on foreign direct investment (FDI) in Nigeria?
- iii. To what extent has covid-19 uncertainty index affected foreign direct investment (FDI) in Nigeria?

**The hypotheses stated in null form are denoted by (H<sub>0</sub>):**

- i. **H<sub>01</sub>:** There is no significant relationship between Covid-19 shocks index and FDI in Nigeria
- ii. **H<sub>02</sub>:** There is no significant relationship between Covid-19 vaccine treatment and foreign direct investment (FDI) in Nigeria
- iii. **H<sub>03</sub>:** Covid-19 uncertainty index has no significant effect on foreign direct investment (FDI) in Nigeria

**Review of Related Literature**

**Conceptual Review**

**Concept of COVID-19**

'COVID-19' is an infectious disease that is popularly referred to as Coronavirus (Ohia, Bakarey, & Ahmad, 2020). According to Taylor (2020), the coronavirus outbreak began in Wuhan, China on December 31, 2019, where Chinese authorities reportedly treated dozens of cases of pneumonia of unknown cause, which scientists in China later identified and attributed to a new virus that would later be known as COVID-19 or the coronavirus. Many scholars such as Riou and Althaus (2020); Zhao, et al, (2020), Backer, et al (2020), and Zhong, et al (2020) reported human-to-human transmission due to the rapid spread of the virus in Hubei Province thereafter. Chinese authorities expanded the scope of their precautionary measures and on the 24<sup>th</sup> January 2020 announced a lockdown in the provincial cities of Wuhan and Hubei, closing airports and suspending all public transport to prevent anyone from entering and exiting. Over the years, the outbreak of the Covid-19 pandemic has synonymously hit the macroeconomic performance of Nigeria's economic growth very hard especially this current devastating effect on foreign direct investment.

**Concept of Foreign Direct Investment**

Foreign direct investment (FDI) is one of the mainstays of national economies because it has been the most dependable source of foreign investment for both developing and advanced countries. It is a category of cross-border investment in which an investor based in one economy demonstrates a continuing interest and a significant degree of influence over an enterprise that is resident in another economy. Foreign direct investment is very important for national economic growth because it serves as an important channel for technology transfer between countries, promotes international trade through access to foreign markets, and serves as a means of economic development (OECD, 2018). Foreign direct investment is thus essential because it helps promote international economic integration, stimulates economic development, facilitates international trade, boosts employment, creates avenues for tax incentives, facilitates resource movement, lowers production costs, leads to increased productivity and increases income (ResearchFDI, 2021).

### **Effect of Covid-19 on FDI Flows in Nigeria**

It is apparent that financial crises lead to liquidity constraints for investors, while disasters triggered by natural hazards destroy physical infrastructures such as roads and industrial parks. Compared to these shocks, one of the most striking features of the COVID-19 pandemic is the forced adoption of infection prevention measures such as lockdowns and social distancing. These measures increase the cost of pre-investment investigation, the cost of finding a site and workers, and the operating cost of FDI in Nigeria.

So, when the widespread covid-19 pandemic hit Nigeria, it brought a lot of macroeconomic quagmire to the citizens. This had the effect of halting all economic activities in all sectors of the economy, resulting in low living standards for people, loss of employment and reduced ease of doing business. As a result, the price of oil, which is Nigeria's main source of income, collapsed and the Nigerian economy became frustrated. As a result of the complete economic blockade, foreign multinational companies (MNCs) have suffered the most, as they cannot export their finished product or appreciate support and assistance from their foreign national counterparts. But this has resulted in a lot of job loss in Nigeria as companies can no longer afford to run their plants and so they have started to devise means of survival. As a result, many workers were laid off, the prices of available products were increased, and many households could not afford to buy. To mitigate the impact of COVID-19 on the economy, Chinery et al (2020) revealed that the Nigerian government sought \$11 billion in new loans from the International Monetary Fund (IMF), domestic banks, the World Bank and others, which would unfortunately increase the country's debt status by almost another 50 per cent. Chinery et al (2020) also argue that the start of the global COVID-19 lockdown in February 2020 also halved the country's foreign remittances, which previously provided much more capital to local businesses than oil and foreign aid.

Spillover from the COVID-19 pandemic has accelerated the decline in demand for petroleum products as well as a limited economic activity following the enforcement of physical distancing policies (Ozili, 2020b). The degree of the economic crisis caused by the COVID-19 pandemic is unprecedented; there is no doubt that it has left dramatic ripple effects in the global economy and has significantly reduced the level of economic activity in every region of the world (Copenhagen Economics, 2020). The COVID-19 pandemic has taken its toll on economic activity so far, and it appears that there is no end in sight for now. This led to a significant impact on social policy as well as on the social and economic well-being of citizens, especially a drastic reduction in economic activities (Ozil, 2020a). Barnett-Howell and Mobarak (2020) note that in the world's poor countries, the costs of lockdowns may be higher, as the disruption of economic activity is itself a major threat to public health, as people's livelihoods depend on daily wages.

In a related study, Maryla et al. (2020) examined the "potential impact of COVID-19 on GDP and trade" using a standard global computable general equilibrium model to model shocks such as underutilization of labour and capital, increases in international trade costs, declines in travel services, and demand diversion away from activities that require closeness between people. The results indicate significant declines in GDP in both developing industrialized countries. The declines were observed to be around 4 per cent below the global benchmark. The outputs of domestic services as well as traded tourism services are the worst affected by the pandemic lockdown.

### **Theoretical Framework**

This study is linked to System Theory. The System Theory by (Boulding, 1956; Bertalanffy, 1951) was made on the assumption that "the whole is more than the sum of its parts". Meaning that individuals perform different types of roles that result in specialization and segmentation, which eventually result in a common interdependence between units. A unit cannot stand and function without depending on others (Durkheim, 1984). Generally, there are three most known boundaries of social systems are Micro System, Mezzo System, and Macro System. Micro System refers to the small size social system example individuals and couples. The Mezzo System refers to intermediate size system example groups and extended families. Macro System refers to large systems example communities, organizations and nations. However, each level stands as a unit of a whole with a different property that differentiates it from other systems (Friedman & Allen, 2011), which Bertalanffy referred to as the system's boundary. Thus, COVID - 19 is interpreted as an element that breaks the boundaries of well-being, and social and economic systems, which are normatively defined.

Furthermore, many nations who give value to shared culture, business and interaction within allies states are suffering major setback to do business families and associates as usual. A lot of countries are suffering major weak health structures and high health situation as the spread of COVID-19 is inclined in donor states. The relevancy of this theory to this study is that countries can use many plans (i.e., loosen or tighten) in responding to a challenging situation. Therefore, FDI of various nations need to take appropriate safeguarding measures on huge tremors that may shake the economy in the occurrence of tragedies such as COVID-19.

### **Empirical Review**

Fernandes (2020) did a critical research on the economic effects of coronavirus outbreak (COVID-19) on the world economy. The study adopted a qualitative survey research method and finds that the outbreak of the coronavirus which lead to shut down of market places as well as worship centers had a devastating negative effect on performance of small and medium scale enterprises.

Thurlow (2020) researched that “the COVID-19 lockdown is imposing significant economic costs on countries in Africa”. It presents an assessment of the economic impacts of COVID-19 in some African countries, with a particular focus on their different impacts on different sectors and types of households. The challenges faced by governments in responding to the crisis and in proceeding to formulate and implement policies for medium- and long-term economic recovery are outlined.

Dzobo et al. (2020) examined "the COVID-19 pandemic situation in Zimbabwe and views on important considerations and strategies for lifting the lockdown" given the likelihood that socioeconomic pressures will challenge the sustainability of the lockdown due to the potential consequences of the lockdown on the economy.

Teachout and Zipfel (2020) examined the “economic impact of the COVID-19 lockdown in sub-Saharan Africa” and sought to quantify the impact of the lockdown on people’s livelihoods. Assumptions have been made about the likely impact of the COVID-19 containment measures on various sectors in sub-Saharan Africa, in line with the results of recent lockdown income stream surveys. They predict that the closure of workplaces caused by the lockdown is likely to severely affect the economy.

Ozili (2020a) examined "COVID-19 in Africa: socio-economic impact, policy response and opportunities in Africa". The design used was discourse analysis. The results show that the coronavirus pandemic has had a significant impact on African countries. The pandemic is taking its toll on economic activities and social interaction through safety measures put in place to contain the pandemic, such as physical distancing. The main result of the study is the influence of social policies on the social and economic well-being of citizens, especially the drastic reduction of economic activities.

Ruzvidzo (2020) noted that “the economic impact of COVID-19 on African cities is likely to be acute due to sharp declines in productivity, jobs and incomes”. COVID-19 is expected to have severe impacts on employment in urban areas. Urban economic sectors (manufacturing and services), which currently account for 64% of Africa's GDP, are expected to be hardest hit by the COVID-19-induced lockdown, leading to significant losses of productive jobs (ECA, 2020). Specifically, the majority of “Africans in informal urban employment (approximately 250 million) are expected to be at risk. Also vulnerable to the COVID-19 pandemic are urban firms and businesses, especially small and medium-sized enterprises, which account for about eighty per cent (80%) of employment in Africa” (ECA, 2020). These risks are compounded by the likely increase in the cost of living that is expected, as shown for example by some early reports of up to 100% price increases for some foods in some African cities (Ruzvidzo, 2020).

Lucas (2020) examined “The Impacts of COVID-19 on Inclusive Economic Growth in Middle-Income Countries”. The proposal was a literature review of studies on coronaviruses. Its findings suggest that COVID-19 is likely to cause far greater economic damage than any recent disease outbreak or economic crisis because its economic impacts are broader and far more severe than most previous crises. Even more worrying is the fact that COVID-19 has caused significant disruption to global value chains, which currently account for more than two-thirds of world trade; and the end of the disruption is not in sight. An excerpt from an Oxford University study revealed that COVID-19 has brutalized communities by unleashing indiscriminate infections and deaths around the world (Shretta, 2020). The

IMF has predicted that the global economy is likely to contract by -3% in 2020 (Crutsinger, 2020) and that “the cumulative global GDP loss in 2020 and 2021 due to the pandemic crisis could be around \$9 trillion, making it the worst economic downturn since the Great Depression” (Gopinath, 2020).

In support of this view, the Organization for Economic Co-operation and Development (2020) notes that restrictive measures imposed to control the spread of the COVID-19 pandemic have led to the temporary closure of many businesses, widespread turbulence in financial markets and erosion of confidence, increased business uncertainty as well as restrictions on travel and mobility. The main impact is reflected in falling output levels of between 20% and 25% in many economies, while consumer spending may fall by around one-third. This adversely affected GDP growth in most countries within the service, retail, non-essential construction and manufacturing sectors; with the least impact on the manufacturing sector as most manufacturing firms are less labour-intensive.

Fu et al. (2021) highlight the adverse impact of COVID-19 on FDI flows. Specifically, they found that the contagion spread in the host country significantly affects FDI project decisions in the host economy. Higher mortality in the host economy also further reduces the announcement value of FDI. The study also found that the severity of the virus in the home country leads to delays in the completion of ongoing projects. In addition, the results of the empirical analysis also show a higher sensitivity of FDI flows to the service sector compared to others.

The economic lockdown due to the Covid-19 pandemic also led to a production shock, which later resulted in an amplified demand shock. To this end, Vidya and Prabheesh (2020) use network analysis and show that the pandemic has led to a reduction in trade interconnectedness, connectivity and density between countries and that there is an expected change in the structure of trade networks. Furthermore, Evenett et al. (2020) highlight that by May 2020, export-restrictive measures in the medical sector peaked versus import-facilitating measures, which saw growth by September 2020, documenting a rapid increase in trade policy activism. In a related study using wavelet analysis, Choi (2020) highlights that the political uncertainty induced by the pandemic affected sectoral volatility to a greater extent than was witnessed during the global financial crisis. Yue et al. (2020) document a shift in investment behaviour toward more risk-averse investments for Chinese households with a connection to someone affected by the COVID-19 virus.

Igwe (2020) carried out a research on Coronavirus with Looming Global Health and Economic Doom. The study utilizes frequency counts and percentages. By November 2020, six months after the social distancing and lockdown ended, the study finds that almost half (48 percent) of all households had run out of food because of lack of money or other resources in the past 30 days, and in 18 percent of households at least one member of the household went without eating for a whole day. Hence the social distancing had exerted a negative effect on the performance of business and households.

### **Gap in Empirical Literature**

A brief look at the empirical review have shown that most of these studies concentrated on developed countries, while very few studies focused on developing countries such as Nigeria. Regarding the economic effects of coronavirus (COVID-19) index on foreign direct investment in Nigeria, some of the studies have reported positive association, some studies reported negative association, while others have reported mixed results, which may arise from differences in choice of statistical models, dependent variable measures, country of study or the study period and sometimes correctness of data used.

From the review it was also observed that all the existing attempts on the subject were quite general in nature and did not focus on the specific item of COVID 19 indices. Although, a number of studies laid emphasizes on lockdown, market closure, social distancing and movement restrictions, but did not take into consideration the economic effects of coronavirus indices on foreign direct investment. It is obvious that the COVID-19 pandemic had led to some economic crises which have notable consequences on every individual and sectors of the economy as a whole. Still, there are yet to be explored empirical studies on the effect of coronavirus called COVID-19 on foreign direct investment in Nigeria. In consideration of the previous methodology this study will deviate a little, utilizing qualitative statistical tools such as; frequency counts, descriptive statistics and regression analysis using SPSS.

This study is therefore, set out to fill these gaps identified and provide the theoretical and empirical justification for COVID-19 pandemic and its effect on the foreign direct investment (FDI) in Nigeria.

**Methodology**

**Research Design**

This study is an empirical investigation of the effect of Covid-19 index on Foreign Direct Investment in Nigeria from 2020 to 2021 using the Generalized Autoregressive Conditional Heteroscedasticity – GARCH model. Covid-19 shocks were measured using indicators that include – the COVID Index (CI), the Vaccine Index (VI) and the Covid-19 Uncertainty Index (UI) – New measures of the Covid-19 pandemic proposed by Narayan et al. (2021).

**Sources of Data**

The data source were generated from a series of words related to the Covid-19 pandemic that was published in 45 daily newspapers from 31 December 2019 to 28 April 2021. For each of them, the Pro-Quest TDM Python word algorithm was used, which led to the generation of different types of data which include (COVID, Medical, Vaccine, Travel, Uncertainty and Aggregate).

On the other hand, foreign direct investment (FDI) was measured by FDI. The net inflow (BoP, current USD) and the general effects of covid-19 and FDI shocks were driven by exchange rate (EXR), and inflation rate (INFR). Hence the nature of data will be monthly available date from December 2019 to April 2021.

**Model Specification**

The generalized autoregressive conditional heteroscedasticity (GARCH) was utilized and serial correlation under heteroskedasticity were considered. Therefore, the Lagrange Multiplier (LM) test will be used to measure the ARCH effect with the null hypothesis of “no ARCH effect in the series”.

$$f(x, \lambda) = f(x) = \lambda_g(x) \text{-----} (i)$$

Where:

$\lambda$  = Langrangan Multiplier

$g(x)$  = equality constraint

$f(x)$  = function

$x$  = integer

Let  $\varepsilon_t$  be time series error term  $\{X_t\}$ . If the real size of the  $\varepsilon_t$  is characterized by stochastic term  $U_t$  and the time-dependent standard deviation  $\sigma_t$ , then;

$$\varepsilon_t = U_t \sigma_t \text{-----} (ii)$$

Where  $U_t$  is the stochastic term of the white noise and the time-dependent variance be expressed as:

$$\sigma_t = \delta_0 + \delta_1 \sum_{t-1}^2 + \delta_p \sum_{t-p}^2, \delta_0 > 0 \text{-----} (iii)$$

$$\delta_t = \delta_t + \sum_{i=1}^p \delta_i \sum_{i-1}^2, \delta_t > 0, i > 0 \text{-----} (iv)$$

Where  $p$  is the lag length of the ARCH model

Thus, considering the ARMA (p, q), equation 5 will be written as follows:

$$X_t - \delta_1 X_{t-1} - \dots - \delta_p X_{t-p} = \varepsilon_t - \beta_1 \varepsilon_{t-1} - \dots - \beta_p \varepsilon_{t-p} \text{-----} (v)$$

Re-parameterizing equation 5, we have:

$$X_t = X_{t-p} + \varepsilon_t \text{-----(vi)}$$

$$\delta_t = w + \delta \sum_{t-p}^2 + \beta_1 \sigma_{t+} + \beta_p \sigma_{t-q} \text{-----(vii)}$$

Thus, equation 7 can be rewritten for ARMA (p, q) as follows.

$$\delta_t = w + \sum_{t-1}^p \delta_i \sum_{t-1}^2 + \sum_{j=1}^q \delta_{t-j} \text{-----(viii)}$$

Hence, equation 8 now represents the GARCH (p, q) model.

### Data Presentation and Analysis

**Table 1: Descriptive Statistics Results**

	FDI	CI	VI	UI	EXR	INFR
Mean	3.064168	67.27373	38.06788	55.95638	11.50823	16.60996
Median	3.0006	6.6528	2.9076	0.6024	11.3952	15.024
Maximum	6.000000	12.00000	14.84000	7.200000	24.00000	60.00000
Minimum	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Std. Dev.	0.732108	15.15346	21.4952	15.02029	2.845901	7.865442
Skewness	0.214901	0.062749	1.17196	0.750598	0.56313	2.076318
Kurtosis	7.842578	6.285904	4.374456	8.422718	8.90156	11.23433
Jarque-Bera	219.0943	87.10937	73.4211	307.3866	353.928	909.9997
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	255	255	255	255	255	255

**Source:** Computed by Researcher Using Eviews 10.0 Statistical Software

Where: FDI represents a foreign direct investment, CI represents Covid Index, VI represents the vaccine index, UI represents the Covid-19 uncertainty index, EXR represents the exchange rate, and INFR represents the inflation rate.

Table 1 depicts that the total variation in the variables ranges from 0 to 60, which represents the smallest and highest values among the variables. Additionally, the result shows that the values of mean, median, standard deviation, Skewness and Kurtosis are not too far from each other, which indicates that the error distribution of the variables is evenly distributed. Relatedly, the Jarque-Bera statistical probability values for the variables are found to be less than 0.05, which means that the variables are normally distributed and confirms that the variables are very suitable for estimating both the effects and association of the covid-19 index on foreign direct investment in Nigeria

**Table 2: GARCH Result**

Dependent Variable: FDI  
 Method: ML ARCH - Normal distribution (Marquardt / EViews legacy)  
 Date: 01/18/23 Time: 05:22  
 Sample (adjusted): 1 255  
 Included observations: 255 after adjustments  
 Convergence achieved after 98 iterations  
 Presample variance: backcast (parameter = 0.7)  
 GARCH = C(6) + C(7)\*RESID(-1)^2 + C(8)\*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.009858	0.0052882	1.864128	0.0201
FDI(1)	-0.00154	0.0019964	-0.77041	0.1572
CI	-0.00066	0.0001222	-5.40393	0.0000
VI	-0.00034	0.0000492	-6.94878	0.0000
UI	-0.00335	0.0002908	-11.5056	0.0000
EXR	-0.00954	0.0011674	-8.17365	0.0000
INFR	-0.00044	0.0001572	-2.78855	0.0000



Variance Equation				
C	0.000598	0.0002433	2.457213	0.0000
RESID(-1)^2	0.072482	0.0329316	2.20098	0.0000
GARCH(-1)	0.000774	0.0001353	5.723282	0.0000
R-squared	0.875497	Mean dependent var		2.298902
Adjusted R-squared	0.765063	S.D. dependent var		0.549686
S.E. of regression	0.091499	Akaike info criterion		-1.75201
Sum squared resid	3.153516	Schwarz criterion		-1.65195
Log likelihood	312.097	Hannan-Quinn criter.		-1.71216
Durbin-Watson stat	0.938129			

**Source: Computed by Researcher Using EViews 10.0 Statistical Software**

Where: FDI represents Foreign Direct Investment, CI represents the Covid Index, VI represents the Vaccine Index, UI represents the Covid-19 Uncertainty Index, EXR represents the Exchange Rate and INFR represents the Inflation Rate.

Table 2 findings from the GARCH result show that the sum of the residual squared values and the first difference of the GARCH coefficient (-1) is less than 1, i.e.  $(0.072482 + 0.000774 = 0.073256)$ . This finding further confirmed the existence of ARCH effects. The explanatory variables exert significant effect on the focal variable.

**Test of Hypothesis One**

**Restatement of the Hypothesis in Null and Alternate forms:**

**Ho<sub>1</sub>:** There is no significant relationship between Covid-19 shocks and FDI in Nigeria

**Ha<sub>1</sub>:** There is significant relationship between Covid-19 shocks and FDI in Nigeria

**Statement of Decision Rule:**

Reject the null hypothesis ( $H_0$ ), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

**Decision**

The result indicates that that Covid-19 shocks have a negative relationship with FDI in Nigeria. This means that the Covid-19 pandemic caused FDI to decline by 5%, which suggests that hypothesis 1 will be rejected and we conclude that Covid-19 shocks have a negative and significant relationship with FDI in Nigeria. These findings concurred with previous empirical findings by Paolo and Galeotti (2020), Feng 2020; Fu et al. 2021; Inegbedion, 2020; Fornaro and Wolf, 2020, among others studies.

**Test of Hypothesis Two**

**Restatement of the Hypothesis in Null and Alternate forms:**

**Ho<sub>2</sub>:** There is no significant relationship between Covid-19 vaccine treatment and FDI in Nigeria

**Ha<sub>2</sub>:** There is significant relationship between Covid-19 vaccine treatment and FDI in Nigeria

**Statement of Decision Rule:**

Reject the null hypothesis ( $H_0$ ), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

**Decision**

The result depicts that Covid-19 vaccine treatment has a negative and significant relationship of 2% on FDI in Nigeria. This, therefore, suggests that the null hypothesis will be rejected and we conclude that the Covid-19 vaccine treatment in Nigeria reduced FDI by 2%. These findings are corroborated by other previous empirical studies conducted by some notable scholars including Inegbedion, 2020; Maryla et al. 2021; Gopinath 2020; Mansi et al. 2020 and Lucas 2020).

### **Test of Hypothesis Three**

#### **Restatement of the Hypothesis in Null and Alternate forms:**

**H<sub>0</sub>:** Covid-19 uncertainty has no significant effect on foreign direct investment (FDI) in Nigeria

**H<sub>a</sub>:** Covid-19 uncertainty has significant effect on foreign direct investment (FDI) in Nigeria

#### **Statement of Decision Rule:**

Reject the null hypothesis ( $H_0$ ), if the p-value of the t-statistics is less than 0.05. Otherwise accept the null hypothesis and reject the alternate hypothesis.

#### **Decision**

The result revealed that there is a negative and significant relationship between FDI and the index of the uncertainties of Covid-19 (UI) in Nigeria. These findings could be justified by citing the consequences of the total economic blockade measures, preventing the movement of goods, services and people across the states of the federation, as well as imposing a ban on emigrants and immigrants in the country, which reduced the inflow and outflow foreign direct investment and foreign remittances of Nigeria. These uncertainties thus made it difficult for investors to make decisions amid high inflation and unpredictable exchange rates. Following these findings, the study, therefore, reject the null hypothesis and conclude that Covid-19 uncertainty has a significant effect on FDI. However, these findings were consistent with previous findings (Barnett-Howell et al. 2020; Backer et al. 2020; Crutsinger 2020; Evenett et al. 2020; Boissay and Rungcharoenkitkul, 2020; Dzobo et al. 2020) among others studies.

#### **Summary of the Findings**

This study is an empirical investigation of the effect of the covid-19 index on foreign direct investment in Nigeria. To effectively study the shocks of Covid-19, the study uses various indices of Covid-19 such as the Covid Index – (CI), Vaccine Index (VI) and the Covid-19 Uncertainty Index (UI) proposed by Narayan et al. (2021). Similarly, net inflows of foreign direct investment (BoP, current USD) and the general effects of covid-19 shocks were used to measure foreign direct investment (FDI), and foreign direct investment was controlled by the exchange rate (EXR) and inflation rate (INFR). Findings from various econometric analyzes that have been conducted show that Covid-19 has caused many shocks in the inflow of foreign direct investment into Nigeria. The GARCH analysis found the existence of a negative relationship between Covid-19 shocks and FDI investment in Nigeria. In terms of hypothesis measurement, the study rejected the null hypothesis 1 as the finding depicts that there is a significant relationship between the Covid-19 index (CI) and foreign direct investment in Nigeria. In the same vein, null hypothesis 2 was equally rejected because vaccine index (VI) has a significant relationship with FDI. Finally, for the hypothesis 3, the null hypothesis was also rejected because the result revealed a significant relationship between the Covid-19 uncertainty index and FDI in Nigeria. Other control variables – the exchange rate and inflation rate showed a negative impact on foreign direct investment due to the Covid-19 pandemic shocks.

#### **Conclusion**

This study have meticulously observed the covid-19 index shocks on foreign direct investment. It is obvious from the preceding analysis that the COVID-19 pandemic is a global health challenge that has affected all continents of the world with varying degrees which include but not limited to the number of people infected with the virus and the fatalities recorded. In regards to the outbreak of the coronavirus disease with its attendant financial consequences on Nigerian economy, one can conveniently say as it is evident from the analysis that, the inflow of FDI in the country is not commensurate with the policies and efforts as well as the economic potentials of the country as it is hampered by the COVID-19 pandemic. This study in line with the findings therefore, concludes that the Covid-19 shocks hurt foreign direct investment in Nigeria. So, the ramifications of the Covid-19 pandemic should be addressed by a government that will have all and sundry sectors at heart to boost the production of companies to increase export rates, generate more revenue and create more jobs for Nigeria.

## Recommendations

The following recommendations were necessary for this study:

- i. The government of Nigeria should build a post COVID-19 diversified and virile economy that will expand the country's access to foreign market as the country will have variety of commodities to trade in the foreign market
- ii. The Federal Government of Nigeria and policymakers should focus on developing international trade of Nigerians with other countries to improve the country's foreign presence and attract more inward and outward investors.
- iii. The ease of doing business in the country should as well be improved to attract both domestic and foreign directors in the country Policies to increase and develop foreign direct investment should be highly valued to increase Nigeria's foreign direct investment.

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