The Impact of Covid-19 Shock on International Trade and Economic Growth in Nigeria

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ABSTRACT

As Corona Virus Disease of 2019 (COVID-19) emerged from China and spread around the world like a pandemic, COVID-19 has disrupted global economies, with restrictions in movement (both domestic and international) leading to large unemployment, supply chains and gross domestic product (GDP) changes across the world. Nigeria been a densely populated country with inadequate medical facilities was left with only one option which was to follow the policy of lockdown. Restrictions on both people and product flow have disrupted supply chains and accelerated the unemployment crisis, thereby impacting on GDP and trade. Thus, discussing the transmission channels through which the shock (covid-19 pandemic) adversely affect the Nigerian economy is considered beneficial. This paper, therefore, examines the impact of covid-19 shock on international trade and economic growth in Nigeria. This study also investigates the causal relationship between international trade and economic growth in Nigeria. The method employed to achieve the stated objectives is the Recursive Structural Vector Autoregression (SVAR) technique and Granger Causality, using the quarterly time series data sourced from the World Bank Development Indicator 2020 and Federal Reserve Economic Data (FRED), for periods between 1985 to 2020.The major findings from the study show that there is a significant negative impact of COVID-19 shock on economic growth and has also impacted negatively on import and export level in Nigeria. It also shows that the impact of COVID-19 was more significant on import than it was on export in Nigeria. Also, the result of from the study revealed that there exists a bidirectional relationship between trade as the sum of exports and imports as a share of GDP and economic growth in Nigeria. With these findings, the study recommends that policymakers take drastic measures to curtail the pandemic and forestall a recession that may be consequent upon the pandemic in Nigeria.

GENERAL INTRODUCTION

1.1   Introduction

The Novel Coronavirus Disease 2019 (COVID-19), which initially surfaced in December 2019 in Wuhan, China, has posed a significant global threat and distress to the global society, taking lives and damaging businesses, as multiple persons are internationally interconnected (Acemoglu et al., 2020; Nakamura and Managi, 2020). World Health Organization (WHO) report as at (April 2021), asserts that globally, there have been around 133.6 million confirmed cases of COVID-19, with a cumulative mortality toll of approximately 2.89 million. Pravakar and Ashwani (2020) opined that around 60% of the world's population is either in severe or partial lockdown due to the lack of medical cure to the coronavirus, and economic activity in many nations has been considerably slowed or interrupted, affecting millions of people's livelihoods. COVID-19 was designated a Public Health Emergency of International Concern by the Director-General of the World Health Organization (WHO) on January 30, 2020, because to the growing threat it poses to human lives and economy (WHO, 2020).

Following the Great Depression of the 1930s, the COVID-19 pandemic will be the most devastating global economic disaster ever. Globalization has slowed as a result of the COVID-19 epidemic, resulting in the greatest and longest decline of GDP (Gross Domestic Product) in capitalism's history. International supply chains, which were once the models of organized industry and the backbone of commerce, have collapsed, and attention has returned to the domestic sector (Kalim, 2020).

COVID-19 is not simply a threat to a particular country or health, but to the entire globe, causing economic, political, social, and psychological disruptions by compelling governments to close their borders and cease all other economic operations. The world economy is expected to decline by 4.9 percent in 2020 as a result of the pandemic, which is substantially worse than it was during the 2008–2009 financial crisis (International Monetary Fund (IMF), 2020). Although there is some research related to the impact of COVID-19 on international and economics growth exist but recently no research is done regarding this gap. The significances of this research are to discover the channels through which the COVID-19 is transmitted into Nigeria and policy implication.

1.2 Problem Statement

The World Bank (2020) projected that as a result of the COVID-19 epidemic, the worldwide Gross Domestic Product (GDP) is expected to plummet drastically in 2020. Advanced economies are anticipated to contract by 7% in 2020, while emerging and underdeveloped economies would contract by 2.5%. Similarly, global trade is expected to fall by more than 13% in 2020, a level greater than that during World War II (World Bank 2020).

Vidya and Prabheesh (2020) postulated that most nations throughout the globe are experiencing declining economic growth, slowing trade, exploding global imbalances, and crippling financial markets, which has resulted in the freezing of the monetary system, so there is little space for complacency. If the 2008 financial crisis significantly impacted global commerce and financial systems, the current pandemic crisis might generate comparable disruptions in demand and supply. Nigeria, a heavily populated country with few medical facilities, has no choice but to implement a lockdown policy. Restriction on both people and product flow has disrupted supply chains and hastened the unemployment crisis, affecting GDP and commerce. As a result, it is vital for nations such as Nigeria to assess the impact of COVID-19 on international commerce and economic growth.

1.3 Objectives of the Study

The broad objective of this study is to offer a comprehensive assessment of the impact of COVID-19 on international trade and economic growth of Nigeria. Consequently, the specific objectives of the study are to:

1. Estimate the impact of COVID-19 on international trade and economic growth in Nigeria.

2. Examine the causal relationship between international trade and economic growth in Nigeria.

1.4 Justification for the Study

The study seeks to investigate and triangulates findings using diverse results of the impact of COVID-19 on international trade and economic growth. This study will analyze the economic impact of COVID-19 through looking at economic growth, and trade data of Nigeria.

COVID-19 is predicted to have an economic impact on every field, including growth, international commerce, financial markets, unemployment, income, poverty, and many other aspects. The impact of the virus spread is predicted to result in a large loss since global trade is badly disrupted (Mishra, 2019), and hence can have a big impact on growth owing to the virus's spread. In terms of foreign commerce, it is predicted to fall by 13–32 percent under optimistic and pessimistic scenarios, respectively (WTO, 2020).

In line with Constantino and Andy (2020), travel restrictions and social distancing programs, for example, are expected to have a considerable impact on global economic activity as part of the NPIs aimed to limit the COVID-19 pandemic. This global shock has broad equilibrium consequences on markets, which have been shown to have a substantial impact on the market cycles of emerging economies. This demonstrates how serious the economic damage is, and how it will continue to have an impact on the world economy through interrupting commerce and development (Baldwin and Mauro, 2020). The General Director of World Trade Organization Azevêdo, (2020) postulated that the amount of global commerce is falling by 13%, and if the epidemic is not controlled and politicians are unable to find a solution, the decrease may be as high as 32% or more.

However, the World Trade Organization predicts that as a result of the global financial crisis, goods and services would contract more steeply in 2020 than they did a decade ago, and this trend is projected to continue in COVID-19 provided nations cooperate together. Vidya and Prabheesh (2020) postulated that the worldwide financial crisis of 2008–09, akin to the Great Depression of 1930, threw the supply network into chaos as a result of a decline in demand from emerging nations. In contrast, the COVID-19 pandemic hindered economic activity because to a decline in the availability of intermediate products and the cessation of manufacturing due to lockdown. He further claimed that the epidemic's impact on global markets escalated significantly as the COVID19 outbreak failed to be contained despite stringent quarantine measures in China, and the pandemic spread to other nations, particularly Europe. Gopinath (2020) posited that the overall loss to global GDP from the pandemic problem might be approximately $9 trillion in 2020 and 2021.

1.5 Scope of the Study

This study focused on the impact of COVID-19 pandemic on international trade and economic growth in Nigeria. The Federal Republic of Nigeria is a West African country bordered by Niger in the north, Chad in the northeast, Cameroon in the east, and Benin in the west. Nigeria is a multicultural country with over 250 ethnic groups speaking 500 different languages and identifying with a wide range of traditions. Nigeria is commonly referred to as the "Giant of Africa" due to its massive population and economy, and the World Bank classifies it as an emerging market. According to the most recent population census, Nigeria has a population of 140,431,691 people spread across 6,000 square miles.

This study adopts an estimate of Recursive Structural Vector Autoregression (SVAR) and Granger Causality under the research methodology and also a trend analysis to evaluate and access the impact of COVID-19 on international trade and economic growth in Nigeria. The main limitation of this paper is the relatively limited availability of data on this subject. For developed countries like the United States, data is very readily available but not in other parts of the world, especially for developing and emerging economies.

1.6 Research Questions

This study aims to answer the following research questions:

1. What is the impact of COVID-19 on international trade and economic growth in Nigeria?

2. What is the causal relationship between international trade and economic growth in Nigeria?

1.7 Statement of the Hypothesis

The hypotheses formulated for this study are:

Hypothesis 1:

H_o: There is no significant impact of COVID-19 on international trade and economic growth in Nigeria.

H_1: There is a significant impact of COVID-19 on international trade and economic growth in Nigeria.

Hypothesis 2:

H_o: There is no causal relationship between international trade and economic growth in Nigeria.

H_1: There is a causal relationship between international trade and economic growth in Nigeria.

1.8 Plan of the study.

Chapter two contains the background to the study looking at the overview of COVID-19 in Nigeria and channels though which COVID-19 is being transmitted in to Nigeria. Chapter three gives an extensive review of relevant theoretical, methodological and empirical literature on the impact of COVID-19 on international trade and
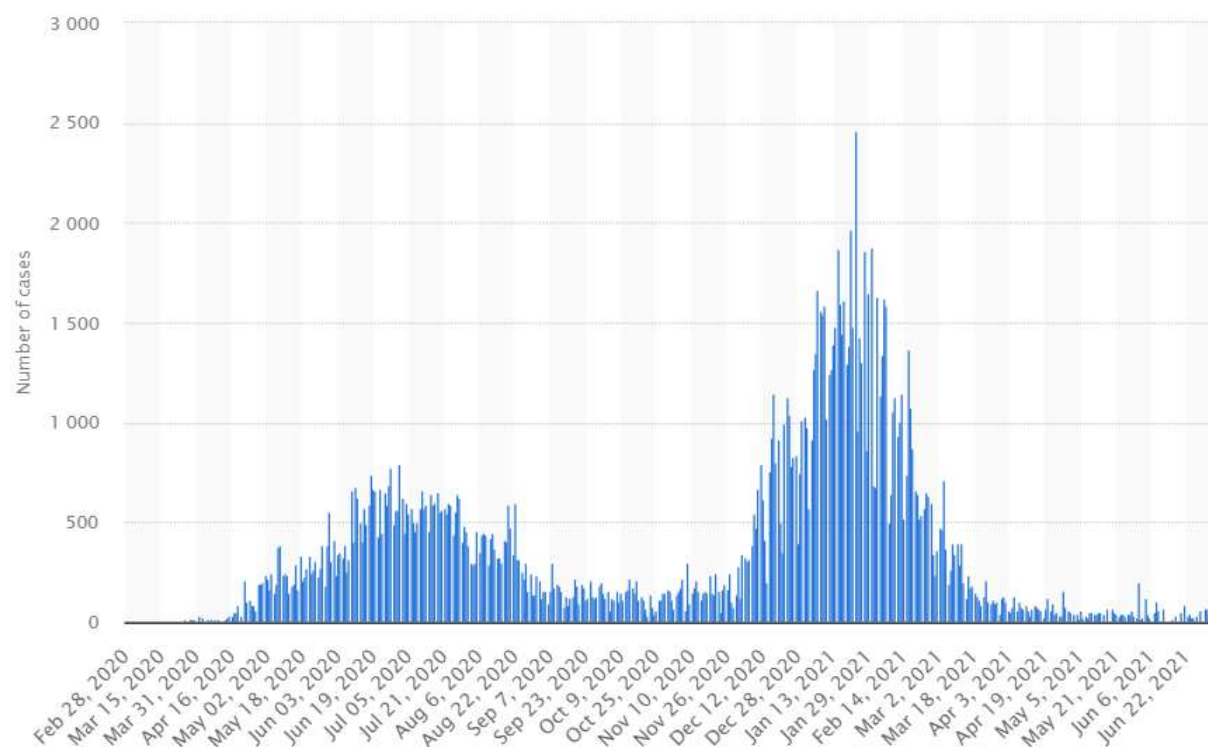
economic growth in Nigeria. Chapter four contains the theoretical framework and research methodology of the study. Chapter five present the analysis, interpretation of results and discussion of the findings. Finally, chapter six provides the summary of major findings, conclusion, policy recommendation, study limitation and direction for further studies.

BACKGROUND OF THE STUDY

2.1 The COVID-19 Pandemic in Nigeria

On February 27, 2020, an Italian businessman visited Nigeria, resulting in the first COVID-19 epidemic in the country. Following the discovery of this index case, the Nigerian government, in collaboration with competent health agencies, took efforts to limit the disease's spread (Omaka-Amari et al. 2020). Despite the Nigerian government's best efforts to limit and prevent the outbreak, as of June 4, 2021, the illness has spread to 36 states, with 167,155 confirmed cases, 163,540 discharged cases, and 2,117 fatalities (NCDC, 2021). Controlling COVID-19's growth across the country was exceedingly difficult, which raised concerns, especially considering the country's lack of health-care resources to tackle the virus. Figure 1 depicts the daily number of confirmed coronavirus cases (COVID-19) in Nigeria from February 15, 2020 to July 9, 2021 (worldometers.info), whereas Figure 2 depicts the cumulative number of confirmed coronavirus cases (COVID-19) in Nigeria from February 28, 2020 to May 3, 2021, indicating a steady increase in the number of cases (Statista, 2021).
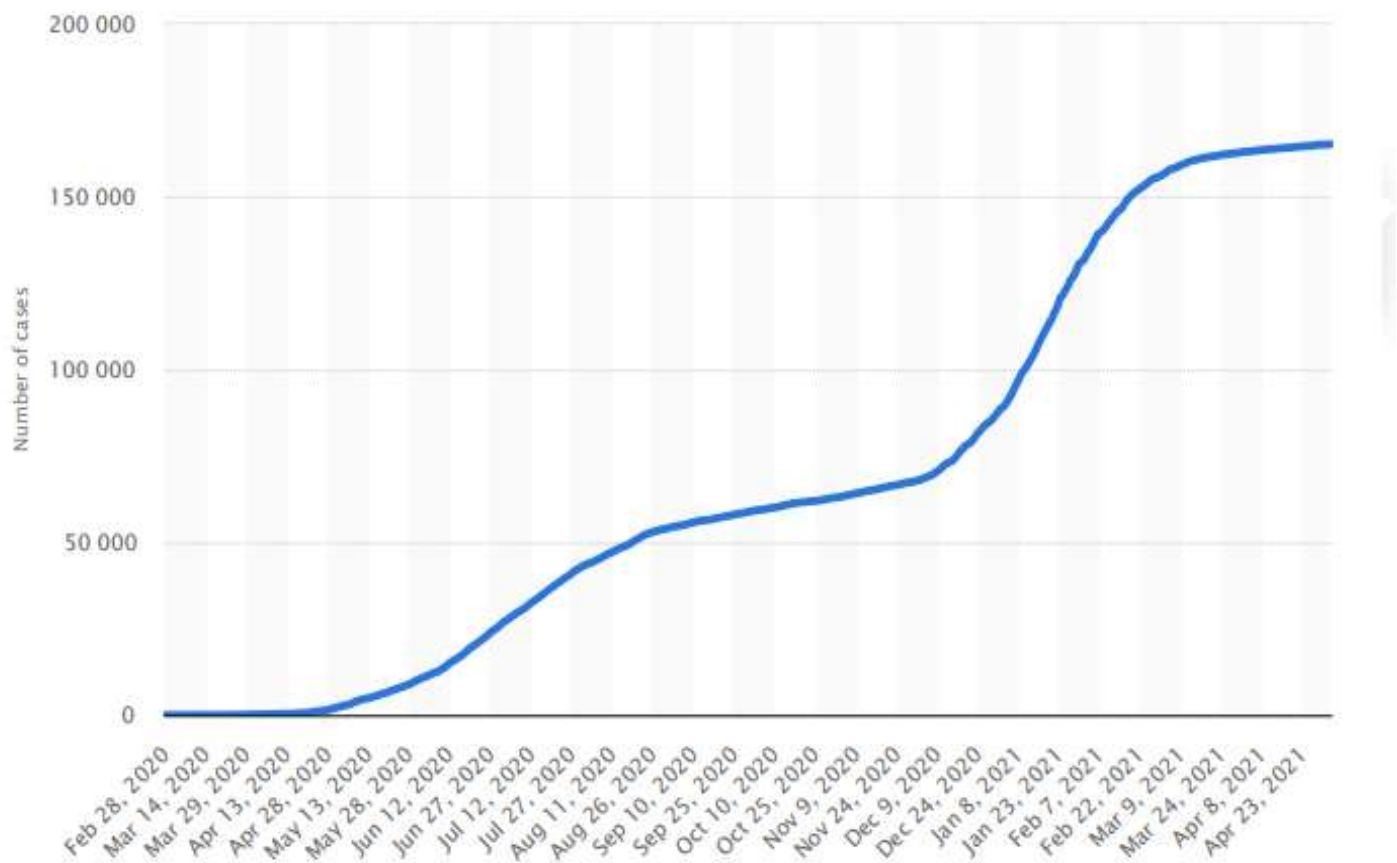
Figure 1: The Daily Coronavirus (COVID-19) Cases in Nigeria from February 28, 2020 to July 5, 2021.

Source: statista.com

As previously reported, the first COVID-19 outbreak in Nigeria occurred on February 27, 2020 in Lagos state (NCDC, 2020), as seen in the graph above. The biggest number of cases were recorded in the country between May and August 2020, as well as December 2020 and January 2021, according to statistics. During the first several weeks of the outbreak, the number of cases progressively climbed, with no deaths reported and a case count considerably below the emergency threshold. However, commencing on the 19th of March 2020, there was a daily increase in the number of new cases, with the number of confirmed cases rapidly increasing to an emergency level. On July 5, 2021, 50 new confirmed coronavirus (COVID-19) infections were reported in Nigeria. The total number of cases in Nigeria was 167.9 thousand. Furthermore, as of July 5, there have been more than 2.1 thousand injuries and 164.4 thousand recoveries.

Figure 2: Cumulative COVID-19 cases in Nigeria (February 28, 2020 to May 3, 2021)

Source: Statista.com

As of April 30, 2020, the total number of confirmed cases was 1,932, with 58 deaths and 319 discharged cases (NCDC 2020). Between the start of the outbreak until April 30, 2020, 15,759 blood samples were examined, with 1,932 of them being positive (Omaka-Amari et. al., 2020). Epidemiological data from persons who tested positive revealed that 210 (11%) had a travel history, 539 (28%) had contact with infected people, 986 (51%) were from unknown sources, and 197 (10%) had insufficient information. Males (70%) were found to be more likely to be infected than females (30%), and people aged 30 to 40 were found to be more likely to be infected than other age groups (NCDC, 2020).

2.2   Economic Overview of COVID-19 Pandemic in Nigeria

The World Bank (2020) opined that because of a dramatic decline in oil prices and a spike in risk aversion in global capital markets, Nigeria is very vulnerable to the global economic turmoil caused by COVID-19. Nationally, 40% of Nigerians (83 million people) are poor, while another 25% (53 million) are vulnerable. The World Bank (2020), posited that as a result of COVID-19, many of these 53 million vulnerable people may fall into poverty. The duration and domestic spread of the outbreak define the extent of the health damage, whereas oil prices dictate the economic impact. Oil contributes for more than 80% of all exports, one-third of total bank credit, and half of total government revenue. Oil prices also have an influence on non-oil industry and service growth, with additional restraints arising from foreign portfolio investors' risk reassessment and local liquidity management (The World Bank 2020).

The macroeconomic situation is worse now than it was in 2015-2016, when oil prices plunged dramatically and Nigeria experienced its first recession in 25 years. Nigeria today has fewer buffers and policy tools in place to mitigate negative impacts. The Excess Crude Account is depleted, foreign reserves are largely reliant on short-term flows, and policy uncertainty undermines investor confidence. Prior to the 2016 recession, Nigeria's economy was increasing at a 6.3 percent annual pace. The economy was growing at a pace of 2.2% prior to COVID-19. Inflation was in the single digits in 2014, but it has already risen to more than 12% in 2019. The

general government budget deficit was 4.4% of GDP in 2019, an increase from 1.8% in 2014 (The World Bank 2020).

Unemployment and underemployment are expected to grow, causing hardship for low-income families and increasing the number of individuals at danger of falling into poverty. Only agriculture is expected to contribute positively to growth by 2020. Economic crises or recessions are usually caused by market corrections (Hart and Tindall, 2009; Jones, 2016), market failure (Stiglitz, 2008; Chauffour and Farole, 2009; Petrakos, 2014), external trade and price shocks (Ros, 1987; Mendis, 2002; Gomulka and Lane, 1997; Francois and Woerz, 2009), political instability (Aisen and Veiga, 2013; Gasiorowski, 1995; Lagravinese, 2015), and civil unrest through protests (Bermeo and Bartels, 2014; Giugni and Grasso, 2016; Grasso and Giugni, 2016; Bernburg, 2016), amongst others.

During the 2016 economic crisis, Ozili (2020) hypothesized that Nigeria's monetary authorities protected the local currency from forced devaluation against the dollar by creating a managed-float foreign exchange system that worked effectively from 2016 to 2019. He also said that during the 2016 economic crisis or recession, it was commonly considered that the sharp and sustained decline in oil prices was the fundamental cause of Nigeria's economic troubles. However, no one foresaw in 2020 that a public health crisis would result in a national economic depression. The Nigerian economic crisis of 2020 was distinct from past crises or recessions in that most economic agents who could have contributed in the recovery of the economy were unable to do so due to fear of contracting the COVID-19 illness. Furthermore, on March 30, 2020, when the government adopted and enforced its social distancing rules and mobility lockdown in Abuja, Lagos, and Ogun states, economic agents did not engage in economic operations.

Despite the fact that the coronavirus outbreak that started in China's Wuhan province spread to Nigeria, the outbreak was severe in Nigeria and caused suffering to poor citizens due to weak institutions that were ineffective in responding to the pandemic and a lack of adequate social welfare programs that would have catered for the majority of poor citizens and vulnerable people. The fear of a financial and economic collapse has resulted in panic purchases, households stocking up on essential goods and food, businesses asking employees to work from home to save money, foreign-currency hijacking by individuals and businesses, primarily for speculative purposes, and a flight to safety in investment and consumption (Ozili, 2020).

2.3 Overview of COVID-19 Pandemic and International Trade in Nigeria

Barua (2020) postulated that trade and money movements have significantly decreased as a result of the pandemic's consequences. Nigeria, the United States, Europe, Japan, South Korea, Vietnam, India, and Singapore are among China's trading partners facing large trade reductions from or to China. When trade expenditures grow and end-product prices rise, the price of an import and export unit rises, and the competitiveness of Chinese manufacturing falls. The final product's pricing is likewise greater. The rising cost of commerce results in a loss of productivity since more inputs are required instead of being made available for consumption and investment in order to deliver goods to their intended recipients. Workman (2020) finds that electrical devices, machinery, mechanics, lighting, plastic items, vehicles, knit, clothing, accessories, optical, technical equipment, medical equipment, and organic chemicals have all seen significant decreases in exports. The Nigerian economy is also concerned about heightened macroeconomic uncertainty, as the country is mainly dependent on Chinese imports, which are in decreasing demand (Barua, 2020). Aside from lower trade flows, the Nigerian government is concerned about challenges that might occur in the next two years as a result of other concerns (e.g., health, biosafety) that may arise as a result of the virus. Global economies, including Nigeria's, are experiencing huge trade disruptions from China. For example, Wei, Wang and Verbraken (2020, February 17) suggests that because of the epidemic, New Zealand will be forced to cancel a large amount of exports to China, including timber, marine products, and meat. The outbreak has the potential to affect Nigeria's trade with China in a number of ways. Suborna (2020) postulated Table 1 shows a summary of the likely effect channels and their timing. China may face significant long-term trade barriers, notably from countries concerned about its health and biosecurity (e.g., Nigeria). This will almost probably result in the establishment of new sorts of stringent trade barriers, potentially worsening trade between China and the rest of the world. Many economies, such as Nigeria, can impose specific and heightened health and bio-safety requirements for Chinese commodities

(e.g., sanitation and pest control). Nigeria is, in reality, suffering trade shocks from three sources: reductions in output and shut-downs, border lock-downs, and import cuts by other countries (e.g., China) due to concerns about the health and bio-safety of goods made in China. Shocks are projected to have the greatest impact on Chinese exports, especially in the long run, as compared to Nigerian imports.

Table 1: Possible channels and timeline of COVID-19 effects on trade flows between China and Nigeria

Channels	Likely timeline of persistence	
	Short term	**Long term**
Chinese shipments to key markets like Nigeria face bans or more rigorous sanitary and technical hurdles.	It may be necessary to impose immediate, largely temporary compliance.	Some steps may be implemented over a period of two to three years before safety is assured.
Nigeria has reduced the entry/allowance of Chinese flag carrier ships, aircraft, and vehicles to air, sea, and land ports, as well as imposed strict bio-safety and health compliance requirements.	It is possible to impose immediate, largely temporary compliance.	Some procedures may be used for a period of two to three years before safety is assured.
Chinese visitors' entry/allowance into Nigeria has been reduced, as has the entry/allowance of international passengers into China.	Border closures and health concerns necessitate immediate, temporary remedies.	Once the crisis is passed, it is unlikely to remain in the long run.
In-person cross-border commercial agreements between Chinese and Nigerian private sector and government partners have decreased.	Border closures and health concerns necessitate immediate, temporary remedies.	Some steps may be implemented over a period of two to three years until the safety of the population is assured.
MNEs presently operating in China may consider shifting production to a safer and more convenient location in order to avoid severe supply chain disruptions.	In the immediate term, we are unlikely to see a large number of them.	If the crisis continues, more irreversible alterations may occur.
Large worldwide buyers of manufactured goods are shifting their sourcing bases from China to Nigeria.	Due to travel bans and health concerns, a temporary shift may occur.	Some changes may be permanent or long-term.
Reduced trading channels for Nigerian exports and imports have increased the cost of transportation and logistical services.	Temporary increase in trade costs	Higher costs are unlikely to last for long if things return to normal.
Suspension of foreign or MNE manufacturing and operations in China; this may decrease market opportunities for these enterprises in Nigeria.	Immediate and temporary strategies to prevent disease transmission	If the crisis continues, some closures may be long-term, resulting in a permanent business/factory shutdown.

Source: Suborna, (2020)

A number of countries with a significant economic contribution from foreign higher education are projected to face large shocks as a result of harsher limits or prohibitions on international arrivals. In the United States, the United Kingdom, and Australia, no international students are expected to arrive during the pandemic, and even fewer will arrive in the months following the pandemic's recovery. Capital flows, as well as foreign trade flows, are likely to decline dramatically. Because of the pandemic, Nigerian investors are more likely to adopt a system to save their investment ideas, monitor them, and then decide on them. Shutdowns also prevent enterprises in

countries such as Nigeria from carrying out ordinary commercial activity, such as making investments. In many economies, businesses are focused on dealing with the immediate breakout crisis, which has replaced all regular economic activity, including investment. UNCTAD (2020) postulated the future of the pandemic's breakout and its economic impacts is largely uncertain, and it will have an impact on private-sector investment programs, particularly direct foreign investment. OECD (2020) estimates that increased uncertainty, as represented by a 10-basis-point increase in investment risk premia across all countries during the first half of 2020, boosts capital costs and significantly reduces investment. Other investment consequences might emerge as a result of increasing capital costs caused by delays in multinational corporations' capital spending. Reduced foreign affiliate profit may result in decreased reinvestment income, which is an essential component of FDI. UNCTAD (2020) reports that as a result of the COVID-19 effects, the top 5.000 multinationals (MNEs) worldwide have already updated their estimates of earnings with a 9% decline in the global average; the biggest hit is likely in Asia (-18 %), followed by transition economies (-16 %), whereas in developing economies the decline is approximately 16% and in the developing economies 6%.

According to NBS (2020), Nigeria's total trade value was N8304.8 billion in Q1 2020. This is 17.94% lower than in Q4 2019, but just 0.80% lower than in Q1 2019. In 2019, it was 0.6% lower. The import component of this trade was anticipated to be N4,221.9 billion, or 50.8% of total trade, while the export component was N4,082.9 billion, or 49.2% of total commerce. Imports surpassed exports during the quarter, resulting in a trade deficit of N138.98 billion, marking the second consecutive quarter with a negative trade balance. Given the worldwide slowdown in economic activity caused by the COVID-19 outbreak, it's worth noting that the next quarter saw negative trade balances (and less imports and exports). In several countries, the global health crisis has resulted in varying degrees of restrictions on foreign trade, travel, and tourism. In comparison to the previous quarter, the deficit in Q1 2020 was 76% lower. On a year-over-year basis, however, the deficit was 116.71% lower. Nigeria's current crude oil exports totaled N2,944.6 billion in Q1 2020, accounting for 72.12% of total exports. The value of crude oil exports was 18.86% lower in the fourth quarter of 2019 and 12.80% lower in the same quarter of 2019. Non-crude oil exports accounted for 27.9% of total exports in 2016, with a value of N1138,3 billion (NBS, 2020).

Figure 3: Summary of Q1 Foreign Trade statistic
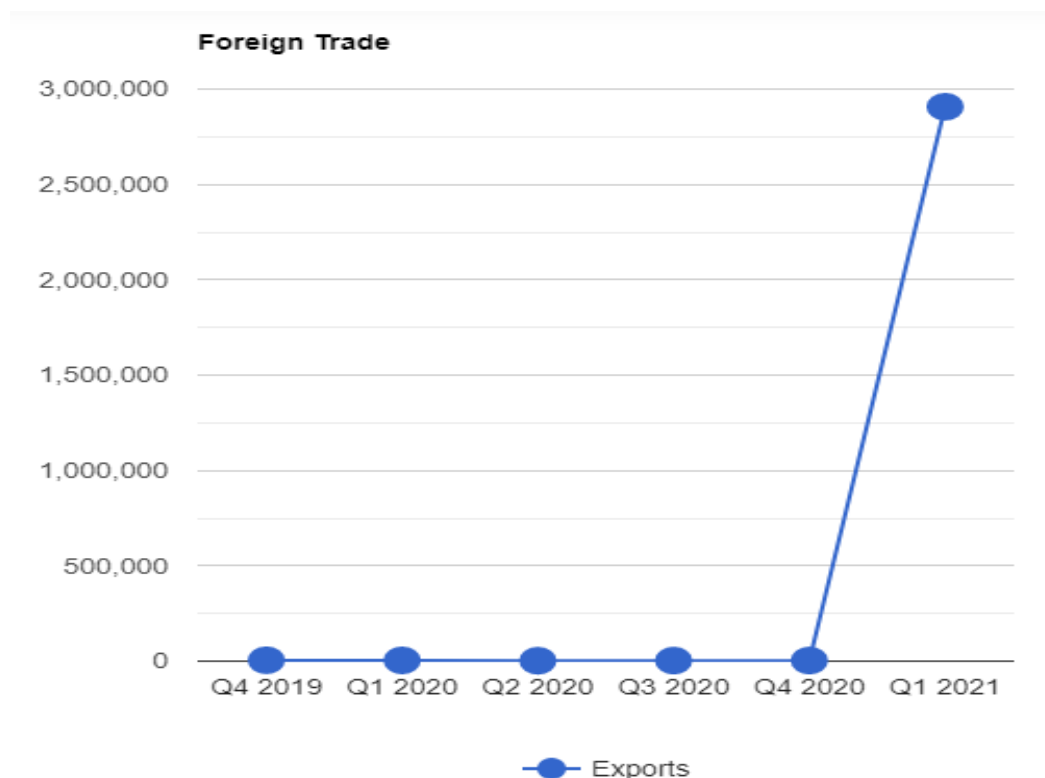

Source: Foreign Trade Statistics – Q1 2020

According to a World Bank assessment on the impact of COVID-19, the pandemic has the greatest impact on commerce across all industries analyzed (World Bank Group 2020). According to the current figures, this might lead to a further reduction in the trade sector, which accounts for 33.0% of Nigeria's GDP in 2018 and 16% in

2019 and 2020 (Ademola, 2020). For the first quarter of 2020, the nominal year-on-year trade growth rate was -0.27%. This is a decrease of –5.09% from the first quarter of 2019. (NBS 2020). Furthermore, the overall trade summary decreased by 17% from US$34.29 billion to US$28.25 billion quarter over quarter. Exports (FOB) declined by 14.9% from US$15.74 billion in Q4 2019 to US$13.39 billion in Q1 2020 (CBN Statistic 2020). Imports (FOB) decreased by 19.7% in the first quarter of 2020, falling from US$17.23 billion to US$13.83 billion (World Bank Group 2018).

Figure 4: Summary of Foreign Trade in Nigeria Q4 (2019 – 2020)

Source: Nigeria Bureau Statistics

Nigeria's overall international trade was predicted to be N8.374 trillion in Q3 2020. The value of the country's exports climbed by 34.9% to N2.99 trillion in Q2 2020 from N2.22 trillion in Q2 2020. In addition, the country's imports in Q3 2020 were N5.39 trillion, up from N4.02 trillion in Q2 2020, representing a 33.8% rise. The increase in the value of the balance of trade may be ascribed to a decrease in the value of crude oil exports (56.04% fall) in Q1 2020. The significant increase in the value of food and live animals (25.8%), beverage and tobacco (16.3%), mineral fuels (219.1%), oil, fats and waxes (25.9%), chemical and related products (33.6%), and miscellaneous and manufactured articles (38.9%) relative to their respective values in Q2 2020 can be attributed to the surge in the value of imports in Q3 2020. In this case, figures from the third quarter of 2020 show that mineral fuels (219.1%) accounted for the biggest percentage of overall imports during the time under examination. Crude oil exports remained at N2.425 trillion in Q3 2020, while non-crude oil exports were recorded at N568 billion.

These declining trade figures, along with a decline in the global oil price to as low as $11.26 per barrel in 2020, explain how the country's trading ecosystem had turned unexpectedly pale and dismal (Prices, 2017). The government's restrictive policies during the lockdown hurt the economy by increasing the country's food security issue. According to the National Bureau of Statistics' COVID-19 National Longitudinal Phone Survey (COVID-19 NLPS), when the lockdown policy was still in operation, 76.8 percent of respondents experienced moderate food insecurity, and 30.3 percent indicated severe food insecurity (Obayelu et al., 2021). This represents a considerable increase from the 37 and 5.9 percent of persons who experienced moderate and severe food insecurity in January and February of this year, respectively. Only 27% of responders who were unable to work due to the outbreak returned to work (NBS 2020).

2.4   Transmission Channel through Which the Shock (COVID-19 Pandemic) Adversely Affect the Nigerian Economy.

The following are the channels via which the COVID-19 epidemic spread into Nigeria:

Aggregate Supply Shock

As a result of the supply shock, international trade expenditures for imports and exports jump by 25%. The shock affects all goods and services. When goods cross borders, they incur trade costs. Additional inspection, reduced operation hours, road closures, border closures, and transportation expenses, among other things, are to blame for alleged increases in transportation and transaction costs in international trade. Evans et al. (2015) estimate that the spread of Ebola might result in a 10% rise in trade expenses. Because COVID-19 is impacting more nations and containment measures appear to be more severe as a result of the virus's containment attempts, we enhanced the shock by boosting international trade expenses of imports and exports by 25%. In line with this is Fornaro and Wolf, (2020), who asserted that the COVID-19 pandemic is expected to trigger a severe aggregate supply slump internationally, owing to output disruptions across economies, including China, as many importers shut down their operations and locked their borders, notably China. Nigeria was badly impacted since it is an import-dependent economy, and as a result, critical commodities such as medicinal supplies, spare parts, and completed items from China were in short supply.

Analysts and economists throughout the world are predicting a drop in output for the remainder of the year for all impacted economies, leading to a global recession in manufacturing and services output that would worsen if the epidemic is not contained by the end of the year. As an epicenter of the epidemic, Africa's business is crumbling in the same way that China's is.

Aggregate demand shock

The aggregate demand shocks that economies are facing as a result of the COVID-19 outbreak are becoming more evident. The epidemic will significantly reduce global demand across economies and reduce global demand for goods and services (Fornaro and Wolf, 2020). As a result of the pandemic, aggregate demand in China and Hong Kong is 4% lower in Q1 2020 and 2% lower in Q2 2020, implying a steeper drop in private and investment spending (OECD, 2020). Demand for the targeted services is expected to fall by 15%. As a result, household demand is reallocated between sectors, yet aggregate spending is still impacted by prior shocks and relative price of consumption basket items. Reduced demand for transportation, restaurants, travel and tourism, and cinemas has a negative influence on aggregate demand in Nigeria and across economies, but rising demand for the internet, television shows, and video games has a positive impact. The overseas market's demand is likewise dwindling. Nigeria's overall import demand decreased by 2.9% from January 2019 to January 2020, despite an increase in medical goods import demand (ITC, 2020). Ozili, (2020) postulated that The oil demand shock was mirrored in a sharp decline in oil prices in Nigeria, with crude oil prices plunging from over US$60 per barrel to as low as US$30 per barrel in March being the most visible and immediate spillover. Travel was halted throughout the pandemic, and demand for aviation fuel and automotive fuels continued to fall, damaging Nigeria's net petroleum income and, eventually, the country's foreign reserves.

International Energy Agency (IEA, 2020), suggested that because China is the world's largest oil importer, global oil demand is expected to fall by 435 kilo barrels per day (kb/d) year on year in the first quarter of 2020, and demand growth in 2020 could fall by 30.7 percent to 825 kb/d (the lowest since 2011), all as a result of China's economic shutdown caused by Covid -19. However, Chinese demand for necessary items on the international market has grown dramatically; according to ITC data, Nigeria's imports of some COVID19-related products surged in January 2020 compared to January 2019, with sterilizer imports virtually doubling (ITC, 2020). Which reaction is significantly greater determines the net aggregate demand response in Nigeria or any other impacted country; If declines in aggregate demand for non-essential commodities and services counterbalance increases in aggregate demand for necessary products and services, an economy's total aggregate demand would likely fall, and vice versa. Despite the fact that there is a propensity to expand supply in response to growing demand for the items required, It is quite likely that this is the case for two reasons: one, Producers are not permitted to

have extra capacity, While two, even if they have, they will not be able to considerably raise their output because this would increase certain fixed expenses that will no longer be viable.

Shock to price level

The decrease of product supply and demand has a direct impact on price levels in both domestic and foreign markets. Price changes, on the other hand, will be determined by the kind of commodity. In the near term, such as during or immediately after a pandemic, excess demand for essential goods is likely to raise their prices relative to their availability in the economy while a fall in demand for non-essential items is likely to result in a decrease in price compared to supply. However, when demand for non-essentials falls dramatically in comparison to demand for essential items, price adjustments in the former would most likely outweigh price adjustments in the latter. In this instance, the entire price level of the afflicted economy may be reduced. Prices for all goods and services may return to normal in the long run once the pandemic is over, if there is enough time to reconstruct the market.

Table 2: Effects of COVID-19 on commodity prices in the international market Commodity Market Index/ Price

	1-Jan-20	27-Mar-20	% Change
Gold	1512	1625	7.47%
Silver Price	17.865	14.356	-19.64%
Crude Oil (Brent)	65.6	21.83	-66.72%
Copper	2.7925	2.172	-22.22%
Natural Gas	2.119	1.640	-22.61%

Source: IG Portal (https://www.ig.com/en/)

As a result of the demand-supply shock and trade interruptions, prices are decreasing fast on a worldwide scale. Already, global stock and non-food commodity prices have fallen by 10% (OECD, 2020). The COVID-19 outbreak has exacerbated the volatility of gold, crude oil, silver, natural gas, and copper prices, with a significant reduction in the preceding three months. Between January and March, crude oil prices fell the most sharply among commodities in the WTF and the Brent Crude Oil Index in Table 2. Crude oil prices plummeted sharply in the last week of March, falling by 66.7% from $65.6 in January (Jones, and Palumbo, 2020). During the same time period, other significant international commodities had similar downward trends, with prices falling by 19.6% for silver spot price (XAG), 22.2% for copper, and 22.6% for natural gas.

Effects on Exchange Rates

The COVID-19 epidemic has not boosted the dollar against all currencies; rather, susceptible countries' currencies appear to have fallen against other currencies. Christopher and Joseph (2020) opined that Stocks of debt issued in foreign currencies that exceed foreign currency reserves and reliance on commodity, mostly energy, exports are the two primary sources of vulnerability. Exchange rates have fluctuated very little in nations that do not have these vulnerabilities. Large exchange rate swings, he added, can have an impact on economic growth, inflation, and commerce. Economies that rely on commodities and emerging countries are the most vulnerable to this danger.

Naira is a typical petrocurrency whose fate is inextricably linked to global oil prices in Nigeria. Jonathan (2020) asserted that Nigeria's central bank (CBN) has established a devaluation threshold of $30 billion in foreign reserves. The CBN has sworn not to devalue the currency, claiming that it is still robust and resilient to epidemic shocks. The apex bank, however, appeared to have swallowed its words when it depreciated the currency in May 2021, pegging the exchange rate of the Naira at N412 to the dollar. The CBN, on the other hand, replied, claiming that what it did was an adjustment rather than a depreciation of the Nigerian currency.

The foreign exchange market reflects the panic-driven atmosphere in both international and domestic markets. Poundsterling (2020) posited that from January 2020 to June 2021, major currencies such as the naira, the pound, the euro, and the yen all depreciated against the US dollar, with the worst losses occurring in the second and third weeks of March (Table 3). As the virus spreads over the world, depreciation might be fueled by a drop in trade flows and fewer international transactions.

Table 3: Exchange rates of major currencies against the Naira

Currency	31/01/2020	22/06/2021
GBP	469.89	573.4
USD	359	411.05
Euro	395.94	490.81
Yen	3.29	3.71

Source: https://www.exchangerates.org.uk/

Effects on Employment and Income

While new jobs may not be created as a result of the aggregate demand and supply shocks, extra layoffs may be created as a result of production cuts and corporate downturns across economies. Plant closures (workers stay at home, leaving capital and natural resources idle) and social distances cause individuals to stay at home result in under-utilization of capacity. Due to higher rates of contagion, immediate unemployment consequences of COVID-related firm closures, and negative demand shocks, we conservatively estimate labor underutilization to be 3% on average across all sectors of the economy for the whole year (Burns et al. 2006). There is considerable ambiguity around these assumptions, and the country-specific employment implications will be decided by the pandemic's duration and intensity, as well as containment efforts, employment sectoral mix, and labor market flexibility. Based on an estimate of global GDP growth, the International Labor Organization projects that global unemployment would rise from 5.3 million (low-case) to 24.7 million (high-case), with the mid-case estimate implying that unemployment will rise by roughly 13 million. In comparison, the numbers appear relevant in light of the global financial crisis's jobless increase of around 22 million in 2008-2009. On the other hand, The quarantine and social distancing measures used to control the spread of COVID-19 have a direct impact on economic activity and labor supply. The ILO (2020) opined that job loss is especially tough for the poor and emerging countries, who rely heavily on export-oriented industries. Previous experience with pandemics and economic crises suggests that particular communities are disproportionately impacted, perhaps leading to increased socioeconomic disparities (Lee and Cho, 2016).

The income shock would eventually result in job losses and wage reductions, with unemployment and earnings decreasing significantly. Many enterprises, both corporations and non-profit organizations, are likely to provide pay cuts and/or pay delays to local and foreign employees since they do not make enough money to cover the payroll. Layoffs in afflicted industries may result in income loss and demand reduction, exacerbating the economic crisis - a scenario known as the 'negative multiplier effect' (El-Erian, 2020). Closing schools resulted in employees losing 30 to 50 percent of their pay, whereas closed amusement parks encouraged employees to maximize their paid vacation time to prepare for unpaid leave (Bloomberg, 2020).
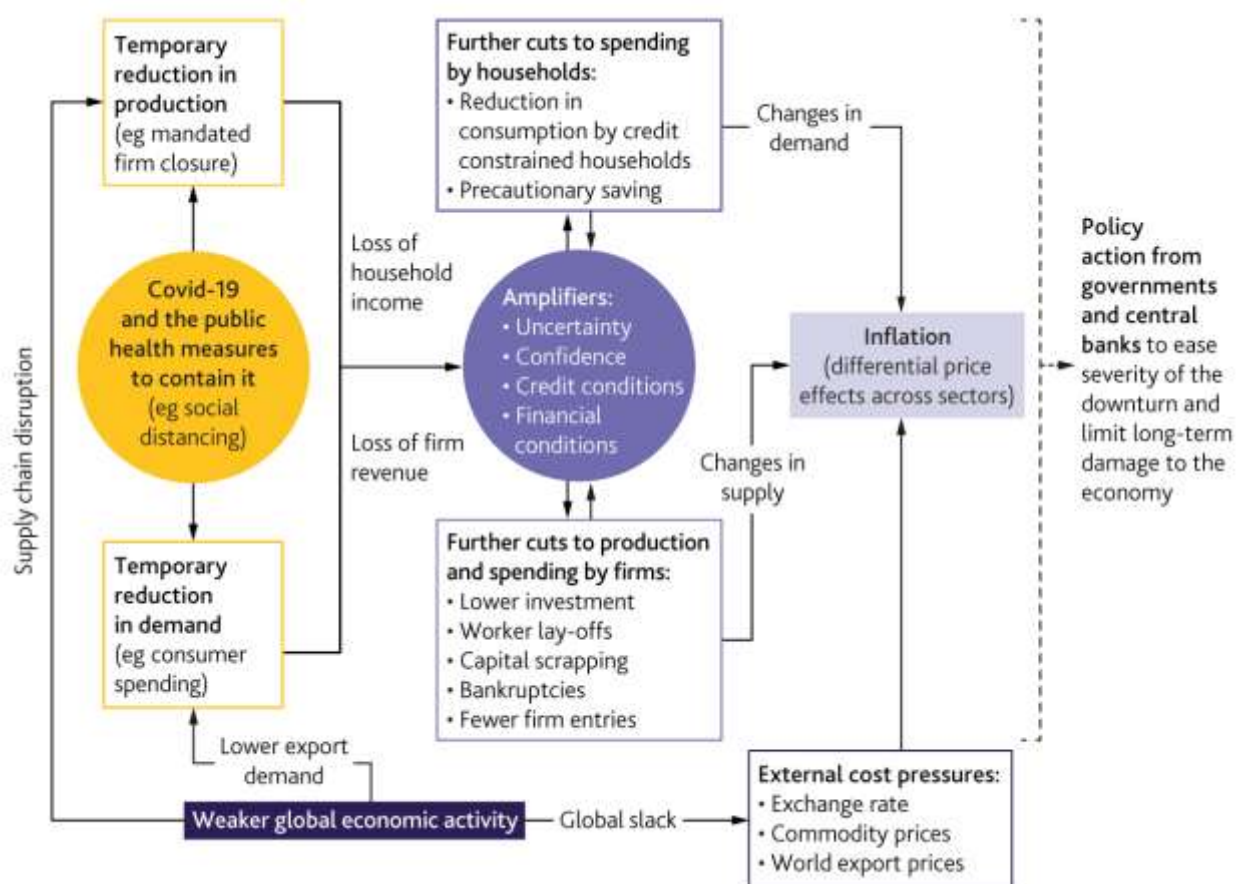
The implications might be disastrous for poor countries that rely on migrant labor exports and international remittances. Job losses and salary delays or nonpayment in many nations may drastically reduce remittance inflows to developing countries such as Nigeria, India, and Bangladesh, putting further strain on their reserve and currency markets. This will exacerbate the unemployment situation in developing countries such as Nigeria, which is already dealing with economic and health-related shocks as a result of the COVID-19. According to the World Bank, the coronavirus will hinder around 24 million individuals in Africa, East Asia, and the Pacific from escaping poverty (Vaswani, 2020). The remittance effect, on the other hand, could be confirmed once the most recent data are available.

Effects on Financial Stability and Risk

Beck (2020); Cecchetti and Schoenholtzon (2020); and Cochrane (2020) postulated that the financial systems are likely to be subject to shocks to both the domestic and global economies. DeCambre (2020) postulated that Global financial markets reacted negatively, with indexes falling to levels not witnessed since the Great Depression of 1929. At the same time, credit spreads have widened and assets in developing markets are being reallocated. For example, banks may face increased credit and default risk during both the pandemic and post-pandemic eras when businesses generate insufficient cash to pay debt due to company closures, shut-downs, and decreased demand for products and services. In addition, lending institutions' economic opportunities may be limited, as private sector investments and consumption continue to fall or remain unchanged both during and after the outbreak. Several loan or investment decisions that have been put off indefinitely may never see the light of day, while When people lack the ability to save or money is scarce, the cost of borrowing for financial institutions, particularly banks, may rise, all of which is related to the pandemic. The Federal Reserve has already decreased its policy rate to provide liquidity to offset the consequences, but the action has sparked worries about financial institutions' health, particularly banks (Adrian, 2020). In addition to banks, insurance firms are anticipated to experience cash flow problems as a result of a combination of more claims and decreased premium collections owing to people's inability to pay. Insurers may also be forced to reassess and reorganize their life and health insurance plans in order to account for the likelihood of a pandemic. Furthermore, the underwriting industry may experience a decrease, and investment opportunities may not provide sufficient earnings, putting investment banks at danger.

COVID-19 has an impact on the economy, according to the Monetary Policy Committee of the Bank of England (2020). They further asserted that Weak global economic activity exacerbates these effects by reducing export demand and disrupting global supply chains. As a result, firm revenue and household income diminish, as seen in the diagram below.

Figure 5: COVID-19 affects economic activity through a series of channels

Source: The Bank of England's Monetary Policy Committee (2020)

Figure 6 above shows that Increased uncertainty, weaker confidence, and tighter financial and credit conditions might exacerbate the early expenditure and output decreases. For example, Individuals may boost their savings as a safeguard, while corporations may lay off workers and sell capital equipment. The impact of COVID-19 on inflation will be determined in part by the balance of these impacts on supply and demand. The impact of demand shifts, partial shutdowns of certain businesses, and considerable variances in experience across sectors are all unknowns (The Bank of England's Monetary Policy Committee 2020).

Spare capacity may have a smaller impact than normal. Increased slack may not be completely represented in decreased costs for enterprises during periods of poor demand if some fixed expenses, such as rent, stay unchanged, for example. Customers are less able and willing to spend, thus businesses are less likely to be able to increase demand by cutting prices, lessening the incentive to do so. Inflation will also be influenced by external cost pressures such as changes in the currency rate and commodity prices (The Bank of England's Monetary Policy Committee2020).

LITERATURE REVIEW

3.1 Introduction

The theoretical, methodological and empirical literature review of studies on the impact of COVID-19 on international trade and economic growth in Nigeria is discussed in this section.

3.2   Theoretical Literature Review

This section discusses the various theories that have been used over the years to explain the impact of health or financial crisis on international trade and economic growth in Nigeria. Economic models can be used to model the consequences of pandemics (Burns et. al. (2006), Bloom et. al. (2005), Lee and McKibbin (2004), McKibbin et al. (2006), Evans et al. (2014)). In literature, five (5) theories have been commonly used: Theory of Keynesian Supply Shock, Keynesian Economic Theory and The Great Depression, Keynesian Business Cycle Theory, Macroeconomic Theory of Aggregate Demand (AD) and Aggregate Supply (AS), Theory of comparative advantage.
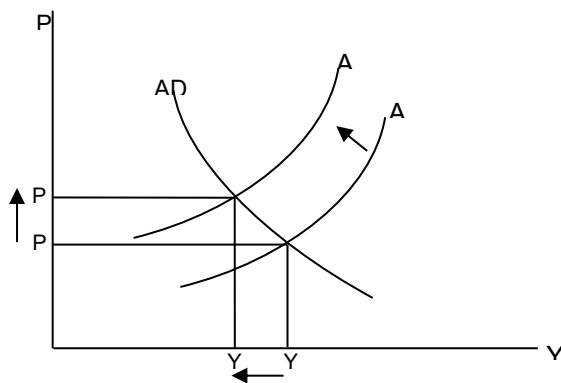
3.2.1   Theory of Keynesian Supply Shock

A supply shock occurs when an unexpected occurrence (the COVID-19 pandemic) alters the supply of a product or commodity, resulting in an unanticipated price adjustment. Supply shocks can be negative, resulting in a fall in supply, or positive, resulting in a rise in supply; nevertheless, supply shocks are frequently negative (Evan, 2020). The impact of a supply shock varies depending on the occurrence, but consumers are often the most affected. Not all supply shocks are negative; supply shocks that generate a supply boom help prices to fall and increase the general quality of life.

In 2020, the Federal Reserve Bank of St. Louis hypothesized that a negative supply shock could have a variety of causes. Any rise in input cost costs might lead the aggregate supply curve to move to the left, raising prices and reducing production. Natural disasters, like as a hurricane or an earthquake, can cause negative supply shocks for a short period of time. Increases in taxes or labor wages can also cause output to stagnate when profit margins shrink and less efficient producers are driven out of company. Obviously, supply shocks can occur during a war. During World War II, the supply of most consumer products fell substantially as many resources were diverted to the war effort and many more industries, supply sites, and transportation routes were destroyed.

The conventional aggregate supply and demand diagram (shown in Figure 6 below) exemplifies the above description, in which an upward-sloping aggregate supply curve advances inward along a fixed aggregate demand curve, as a result, the price level rises while output falls, resulting in a stagflation Ary consequence.

Figure 6: Supply shock in the AS/AD framework

Source: Authors Computation

Supply Shock and 1970s Stagflation

The most well-known supply shock in contemporary American history happened in the oil markets during the 1970s, when the country was suffering from severe stagflation. The emergence of stagflation in the 1970s was attributed to the US Federal Reserve's unsustainable economic strategy during the late 1950s and 1960s boom years. In the 1960s, the Fed took steps to reduce unemployment and improve general demand for goods and services. However, the decade's unusually low unemployment generated a phenomenon known as a wage-price spiral (Federal Reserve History 2020).

The 1973 oil embargo imposed by the Organization of Arab Petroleum Exporting Countries (OAPEC) on numerous Western nations, including the United States, also contributed to the unwelcome economic occurrence in the United States. Excessively high oil costs and shortages harmed industries across the country. The effective supply of oil in the United States has decreased dramatically, and prices have risen (U.S. Department of State 2020). Federal Reserve Bank of St. Louis (2020) postulated that the Federal Reserve sought to revive the economy through monetary easing, but actual output could not rise as long as government restraints maintained.

The Keynesian supply shocks theory was also presented by Guerrieri et al. (2020). The hypothesis of "Keynesian supply shocks": supply shocks that cause changes in aggregate demand that are bigger than the shocks themselves. They contend that economic shocks related with the COVID-19 outbreak shutdowns, layoffs, and business departures may exhibit this characteristic. They offered a two-sector model with imperfect markets in the theory and discovered that a 50% shock that strikes all sectors is not the same as a 100% shock that hits half the economy. Incomplete markets increase the likelihood of Keynesian supply shocks occurring. Exiting firms and job losses can exacerbate the initial effect, exacerbating the recession. Guerrieri et al. (2020) asserted that the COVID-19 shock might be a 'Keynesian supply shock,' meaning that it creates a fall in aggregate demand that is greater than the original reduction in labor supply.

In the evaluation of Keynesian supply shock theory, Guerrieri et al. (2020) opined that they discover that people's decision to limit consumption, represented (in a simplified manner) as a "consumption tax," and labor lessens the severity of the pandemic, as measured by total fatalities, but exacerbates the magnitude of the recession. Because infected people do not completely absorb the impact of their economic actions on viral propagation, the competitive equilibrium is not socially desirable. According to their benchmark, the best basic containment program worsens the recession while saving about half a million lives in the United States.

Evan (2020) asserted that Assuming aggregate demand remains constant, a negative (or unfavorable) supply shock causes a product's price to rise, whereas a positive supply shock causes the price to fall. A negative supply shock reduces output, which causes prices to rise owing to a change in the supply curve to the left, whereas a positive supply shock increases output, which causes prices to fall due to a shift in the supply curve to the right. Supply shocks can be caused by any unexpected occurrence that reduces output or interrupts the supply chain, including natural catastrophes and geopolitical upheavals such as acts of war or terrorism. Crude oil is usually

regarded as the commodity most sensitive to negative supply shocks, owing to the fact that the majority of the world's supply originates in the volatile Middle East area.

Guerrieri et al. (2020) posited that a transient negative supply shock, such as the COVID-19 epidemic, produces a considerable decrease in output and employment. Supply shock recessions, as bad as they may be, are partially an efficient reaction, because production and employment will almost surely decline.

Guerrieri et al. (2020) asks a simple question when he present the "Keynesian supply shocks": Can a supply shock, such as that encountered during a pandemic, result in insufficient demand? what are the combinations of monetary and fiscal policy instruments that best address this question? And his answer is positive, the supply shock may cause demand to overreact, resulting in a demand-deficient recession. Low substitutability across sectors, as well as imperfect markets and cash-strapped customers, all contribute to the probability of Keynesian supply shocks.

3.2.2   Keynesian Economic Theory and The Great Depression

Keynesian economics is a macroeconomic economic theory that examines overall economic expenditure and its impact on production, employment, and inflation. Keynesian economics was established during the 1930s by the British economist John Maynard Keynes in an attempt to comprehend the Great Depression. Keynesian economics is commonly referred to as "depression economics," because Keynes' General Theory was produced during a period of profound depression not only in his own country of the United Kingdom, but throughout the world. The renowned 1936 book was influenced by Keynes' understanding of events that occurred during the Great Depression, which Keynes thought could not be explained by classical economic theory as he depicted it in his book.

Other economists claimed that, in the aftermath of a broad economic slump, firms and investors taking advantage of lower input prices in pursuit of their own self-interest would, unless otherwise prohibited, return production and prices to a condition of equilibrium. The Great Depression, according to Keynes, seemed to contradict this premise. During this period, output was poor and unemployment was high. The Great Depression spurred Keynes to reconsider the nature of the economy. He developed real-world applications based on these theories, which might have repercussions for a society under economic distress.

Keynes opposed the notion of the economy returning to a natural state of equilibrium. Instead, he claimed that once an economic slump occurs, for whatever reason, the dread and pessimism that it generates among firms and investors tends to become self-fulfilling, leading to a prolonged period of low economic activity and unemployment. In response to this, Keynes supported a countercyclical fiscal strategy in which the government would incur deficit spending to compensate for a decrease in investment and raise consumer expenditure in order to stabilize aggregate demand during periods of economic adversity.

The Assumption of Keynesian Theory

The Keynesian theory is based on the following assumptions:

- Unemployment is caused by fundamental flaws in the economic system. It is not the result of sloth, as previously thought.

- During a recession, the economy may not recover to full employment on its own. To boost economic development, the government must step in and use government expenditure. The economy operates below its potential production and growth rate because to a lack of investment in products and services.

- To lower the amplitude of the business cycle, an active stabilizing strategy is required. One of the most important economic issues, according to Keynesian economists, was aggregate demand for goods and services not matching supply. Excessive saving, saving beyond investment, is a serious problem that encouraged recession and even depression.

- Wage cuts will not solve a recession.

- Overcoming an economic downturn needs economic stimulation, which may be accomplished by lowering interest rates and increasing government spending.

Keynes called for higher government spending and reduced taxation based on Keynesian economic theory in order to stimulate demand and bring the world economy out of the depression. Keynes, who was writing at a moment of profound economic downturn, was less enthusiastic about the market's inherent equilibrium. When it came to building a strong economy, he thought the government was in a stronger position than market forces. Following that, Keynesian economics was used to refer to the idea that optimal economic performance might be reached and economic slumps avoided by influencing aggregate demand through active stabilization and government economic intervention measures.

Global Financial Crisis (2007-2008)

The 2008 financial crisis was the biggest economic calamity since the 1929 stock market crash. It began with a subprime mortgage lending crisis in 2007 and grew into a worldwide financial crisis with the September 2008 fall of investment bank Lehman Brothers. Massive bailouts and other measures aimed at limiting the spread of the damage failed, and the world economy entered a recession.

The present global financial crisis is the consequence of a multitude of reasons, the most important of which are: (a) the collapse of the United States housing market, (b) the lax financial regulatory conditions, and (c) the absence of stringent corporate governance requirements in the United States and most other developed economies (Krugman, 2008).

The crisis' influence on the Nigerian economy has several consequences for the capital market, the banking sector, foreign exchange and the balance of payments, and the real sector. In 2008, market capitalization declined by 45.8 percent, a significant turnaround from 2007, when the market surged by 74.7% (Okereke-Onyiuke, 2009).

Ajakaiye and Fakiyesi (2009) postulated that the global financial crisis has slowed global economic development, resulting in weaker demand for commodities, particularly oil. This influence has been conveyed to the Nigerian economy via numerous channels, most notably: i) impact earnings and revenue; ii) reduction in the naira exchange rate; iii) the balance of payments through narrowing of the surplus on the current account balance; iv) the capital account through reduction in capital flows because of reappraisal of planned investments or complete stoppage of previously committed programmes of investment; and v) contraction of fiscal space for policy.

The global financial crisis has had a massive and pervasive impact on Nigeria's growth and development. The first point of influence is the decrease in the price of oil. This is followed by a drop in the stock market's share price. The combination of these two factors resulted in the naira's devaluation. The withdrawal of foreign portfolio investment (hedge funds) from the Nigerian market aggravates the issue even further. Foreign portfolio investors have withdrawn around $15 billion from the country's financial markets as of January 2009. Such huge withdrawals exacerbate the confidence issue, complicating the stock market recovery process. The propagation of these effects to the real and financial sectors would undoubtedly impede Nigeria's economic growth and development (Ajakaiye and Fakiyesi, 2009).

The financial crisis has had a minimal influence on the Nigerian economy so far, since most commercial banks in the area have abstained from investing in distressed assets from the United States and other parts of the world (Oladipo and Fabayo, 2012).

3.2.3 Keynesian Business Cycle Theory

The real business cycle hypothesis asserts that economic variations are caused by real rather than monetary or nominal shocks (i.e. COVID-19 pandemic, shocks to technology, shift in aggregate consumer preferences). The

purpose of a real business cycle study is to figure out how "real" shocks influence production, employment, hours, consumption, investment, productivity, and other factors. The actual business cycle models are also intended to identify how disruptions in one area of the economy influence other sectors of the economy at a certain period (Yeager, 2018).

'There are two primary causes of crises,' said Keynes. One is the loss of overly optimistic anticipation, which is symbolized by the decline of capital's marginal efficiency. The anticipation raises the expected return on capital (price) in the capital goods market to a risky level, causing the bubble to burst. The bubble will ultimately burst, resulting in the collapse of capital's marginal efficiency, and the process of collapse will be relatively quick in comparison to the long period of incubation and buildup of the crisis. Another factor is a lack of effective demand. The marginal willingness to consume is less than one and steadily reduces consumption. It is self-evident that widening the gap between affluent and poor will reduce society's proclivity to spend and exacerbate the problem of over-investment. The reality of the international economy in 1928 and 2007 is the excessively high price of assets and a drop in actual demand. The American economy experienced two setbacks in a single year during the Great Depression of 1929. That is, the stock market fall in October 1929 and the subsequent financial crisis in October of the same year. Productivity index, wholesale price index, and personal income index decrease by 26%, 14%, and 16% respectively. Following his study of the crisis, Keynes argues that the recovery of capital's marginal efficiency requires the absorption of large amounts of capital inventory. It is a process of negative investment that will ultimately lead to a decrease in employment rates. After the stockpiles have been used and the negative investment has been finished, the rate will begin to rise.

Stockman cited in Yeager (2018) postulated that for a variety of reasons, genuine business cycle analysis is necessary and fascinating. First, the evidence that monetary policy has an impact on actual production is significantly weaker than most economists believe. Second, even if monetary policy has an impact on actual production, the evidence suggesting it is the primary driver of economic cycles is far less than previously assumed. Third, Despite the fact that monetary disturbances play a significant role in many real-world business cycles, most economists believe that supply shocks and other nonmonetary disturbances, such as the COVID-19 Pandemic, oil price changes, and technological progress, play a significant role in some aggregate fluctuations.

Assumptions of Real Business Cycle Theory:

The real business cycle theory is based on the following assumptions:

- The economy is based on a single commodity.

- Prices and wages are flexible.

- The money supply and price level have no effect on real-world factors like production and employment.

- Job changes are entirely optional.

- Population is given. So, there is fixed labour force.

- Everyone has the same preferences which depend only on consumption in each year.

- More consumption is preferred to less so that the marginal utility from consumption diminishes.

- The economy is subject to irregular (random) real supply side shocks.

- There are substantial changes in the rate of technology that affect the whole economy (which is viewed as a single sector).

- There is constant return to scale production-technology.

- The economy is in a steady state.

Baker et al. (2020) garner that in the fourth quarter of 2020, a COVID-19 shock results in an 11 percent year-on-year loss of GDP, according to the real business cycle (RBC) model. He further asserted that, more than half the contraction is caused by COVID-19- induced uncertainty. Coibion et al. (2020) opined that surveys are used to gauge households' macroeconomic expectations in the United States. Lockdowns, not COVID19 infections, are found to be the primary cause of decreased consumption, employment, reduced inflationary expectations, higher uncertainty, and lower mortgage payments.

Market expectations and investor psychology vary irrationally, according to Keynes, and this is an unavoidable byproduct of a free market economy. "The job of arranging the present level of investment cannot safely be left in private hands" in order to prevent the effect of the business cycle.

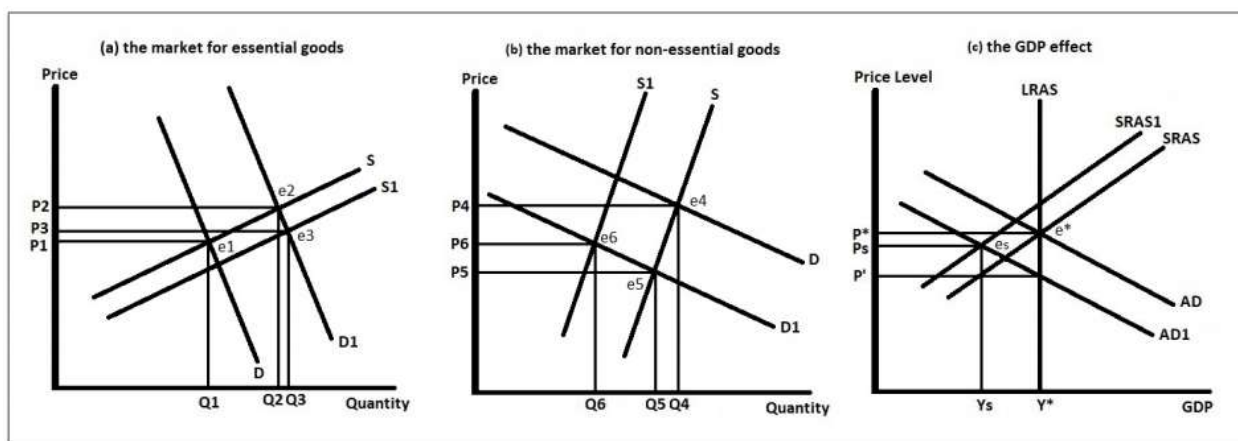### 3.2.4 Macroeconomic Theory of Aggregate Demand (AD) and Aggregate Supply (AS)

The empirical examination of the influence of COVID-19 on economic development and foreign commerce in Nigeria is based on the aggregate demand and aggregate supply (AD-AS) model, which is congruent with Blanchard and Quah (1989) and Cover et al. (2006). Because the effect of COVID-19 on GDP is likely to be the result of a complex interaction of various elements addressed thus far, describing the effects with typical macroeconomic models may be challenging and incomplete (Baldwin and Mauro, 2020). Accepting this constraint, a basic macroeconomic model of aggregate demand (AD) and aggregate supply (AS) is used to depict the anticipated impact of the COVID-19 epidemic on GDP in a country. The COVID-19 epidemic has undoubtedly generated supply and demand shocks, among other things. Economic activity is subject to considerable variations as a result of aggregate demand and supply shocks.

The illustration is however subject to some assumptions;

- The economy is generally functioning at full employment, producing the equilibrium level of GDP indicated by the long-run AS and AD;

- The AD and AS of the economy finally reflect all macroeconomic repercussions of the COVID-19 pandemic; and

- In an economy, aggregate demand and supply are the demand for and supply of both necessary and non-essential items (for example, food and medicine) (e.g., cars, tourism).

The diagram below aids in comprehending the available information on the demand and supply shocks described in previous parts.

Figure 7: COVID-19 Effects on International Trade and GDP

Source: Suborna, (2020)

Figure 7 depicts three graphs depicting COVID-19's potential impact on import and export of both necessary and non-essential products, as well as an economy's GDP. In graph (a), With quantity Q1 and price P1, the

market's initial equilibrium for essential products is at e1. The demand for basic products such as food and medication skyrockets during a pandemic. In graph (a), A change from the initial demand curve D to D1 reflects increases in demand for vital items. As a result, the price of necessary products rises to P2, and the amount of commodities exchanged rises to Q2. As demand for vital items such as medication and medical supplies grows, many manufacturers may begin to shift their production to meet this need; for example, many businesses grow up in Nigeria, producing face masks and ventilators while Companies such as General Motors have joined the Ventilator production line in the United States (DeBord, 2020), and Many enterprises in China have switched from producing conventional items to masks and other supplies (Reagan, 2020). Furthermore, in an afflicted economy, such commodities may be imported at a higher rate. As a result of the massive demand rises, supply may increase marginally, moving the supply curve from S to S1; However, the shift is unlikely to be significant for at least two reasons: One, producers transitioning from other industries (e.g., automobiles) may lack the necessary technologies, skill, and experience producing vital (e.g., medical) items in large quantities, as if you were a regular manufacturer; and two, as the epidemic spreads over the world, global demand for items such as medication and medical equipment rises, as is the case right now(e.g., medical goods such as masks, ventilators, testing kits, and personal protective equipment have risen in demand in all nations across the world, including Italy, the United Kingdom, Spain, Japan, Korea, and the United States). Furthermore, many vital items, such as producing food in a short amount of time, may be difficult to produce. An increase in the amount of supply now results in a new equilibrium of e3, where larger quantity of necessary items Q3 are exchanged at a price P3; The price is still lower than P2, which was achieved due to a significant rise in demand. However, P3 remains higher than P1, indicating that if no new producers enter the market, necessary items prices are likely to stay higher than they were during normal times (P1). The good news is that demand for these commodities is currently being satisfied at a higher level than in normal times. Figure 8 graph (b) shows the market's response to changes in non-essential commodity demand and supply. According to emerging research, there is a significant decline in demand for non-essential and luxury products such as automobiles. Graph (b) shows that the non-essential products market is at the initial equilibrium e4, where Q4 quantity is exchanged at a price of P4. As demand declines rapidly and significantly, the demand curve shifts back from D to D1, causing prices to fall from P4 to P5 and quantity traded to fall from Q4 to Q5. Many producers may be forced out of the market over time as a result of border restrictions, temporary business and factory closures, and permanent company shut-down and insolvency during a long-term pandemic phase. This would reduce the initial level of production and availability of vital products; Two more variables might possibly lead to such a reduction in output: One, many producers may transfer resources from non-essential items to manufacture vital goods (e.g., General Motors in the US), and two, lower export demand would arise from a drop in global demand for non-essential and luxury items. Graph (b) depicts the supply cut as a shift to the left of the market supply curve S to S1; As a result, the price of P6 trading a lower Q6 quantity rises slightly. However, the enhanced price level P6 remains lower than the initial price level P4, largely because a drop in demand prevents prices from returning to that level. The aggregate demand impact in a country like Nigeria is determined by the entire effect of demand for essential and non-essential items. Evidence shows that in the case of a COVID-19 pandemic, the degree of demand decrease for non-essential commodities compensates increases in demand for necessary goods. Under these conditions, aggregate demand in the economy should fall from its typical level when the demand consequences of both necessary and non-essential products are considered. On the other hand, increases in supply of vital products are likely to be modest, while declines in supply of non-essential commodities are likely to be substantial, resulting in a fall in aggregate supply. This is due to the fact that supply would likely to respond in proportion to the amount of demand reductions for both items. The supply response is explained by the fact that in most economies, the percentage of non-essential industrial items in total output is much greater than the share of necessary commodities. In graph (c) illustrates an economy's first long-run AD-AS full-employment equilibrium at e*, in which the economy generates Y* level of GDP at P* price level. In the short-run, the shift of the AD curve to AD1 and SRAS1 reflects a fall in aggregate demand and aggregate supply as a result of pandemic impacts. As a result, the economy reaches point es, where it is expected to create a lower GDP of 'Ys' relative to its full-employment level Y* at a lower price level Ps from P*. Suborna, (2020) postulated that in the short run, an economy is likely to suffer decreased national output and income, as well as deflationary pressures, which, if sustained, will lead to recession. In the long run, if the economy is able to recover output but is unable to revive aggregate demand, the economy will suffer, the economy obtains GDP of Y*, while the price level falls to P'. This implies that, in the long run, restoring macroeconomic equilibrium to full employment, or something near to it, will need a big and upward demand shock.

3.2.5 Theory of Comparative Advantage (Ricardian Model)

A comparative advantage is defined as a country's ability to provide an item or service at a lower opportunity cost than another country. David Ricardo, a political economist, is credited with developing the idea of comparative advantage, often known as the Ricardian Model, in his work Principles of Political Economy and Taxation (1817). From 1815 through 1846, Ricardo utilized comparative advantage to argue against Great Britain's protectionist Corn Laws, which banned wheat imports. The political economist argued for free trade by stating that countries would be better off specializing in what they have a comparative advantage in and importing things in which they do not.

When a country provides an item or service for a lower opportunity cost than other countries, it is said to have comparative advantage. A trade-off is measured by opportunity cost. The trade-off is worth it for a country with a competitive advantage. The advantages of purchasing its product or service exceed the drawbacks. It's possible that the country isn't the greatest at manufacturing anything. However, importing the commodity or service has a low opportunity cost for other nations. For example, Chemicals are a comparative advantage for oil-producing countries like Nigeria. When compared to nations without it, their domestically produced oil provides a low-cost supply of material for the chemicals. The oil distilling process produces a lot of the basic components. As a result, Nigeria, Saudi Arabia, Kuwait, and Mexico are able to compete with chemical manufacturing companies in the United States. Because their compounds are low-priced, they have a low opportunity cost (U.S. Bureau of Labor Statistics, 2020).

Assumptions of the Theory of Comparative Advantage (Ricardian Model)

The following are a set of assumptions that drive theory of comparative advantage (Ricardian Model), research and practice.

- The model assumes that two nations produce two items with labor as the only input.
- Goods across enterprises and nations are considered to be homogenous (i.e., same).
- Within a country, labor is homogenous, but between countries, it is heterogeneous (nonidentical).
- Goods may be moved across nations at the lowest possible cost.
- Labor may be transferred between industries within a nation at the lowest cost, but it cannot be moved across countries.
- Labor is always fully employed.
- Disparities in production technology vary among sectors and nations, and these differences are reflected in worker productivity characteristics.
- Both nations' labor and products markets are considered to be completely competitive.
- Profit maximization is assumed for businesses, whereas utility maximization is assumed for customers (workers).

Farrell and Newman (2020) asserted that specialization allows for the optimization of total production and increase in welfare, according to the theory of comparative advantage, which provides the foundation for the current system of international trade of commodities and services. The COVID-19 pandemic, on the other hand, has demonstrated that the system's evident advantages come at a cost. Farrell and Newman (2020) further stated that, "In times of crisis, single-source suppliers, or parts of the globe that specialize in one specific commodity, might cause unforeseen fragility, leading supply chains to break down." Such interruptions can have a substantial impact on both individual Nigerian businesses and global distribution chains. For example, China is the world's largest supplier of active pharmaceutical ingredients, which are used in a wide range of treatments. In 2018, it imported 95% of ibuprofen, 91% of hydrocortisone, 40–45% of penicillin, and 40% of heparin into the United States (Palmer and Bermingham, 2019). When industrial facilities are not completely operating during a crisis, this issue becomes much more troublesome, while The home market's need may force countries to reroute some of their exports. This is also true in other industries, even if the ramifications of potential interruptions aren't as severe.

From a theoretical perspective, Suborna (2020) opined that COVID-19 is projected to have a significant influence on international trade in a variety of ways. Naturally, importing nations like Nigeria have a greater COVID-19 burden due to lower aggregate demand in that country. Reduced demand will result from lower incomes and fewer visits to retail outlets. Similarly, The COVID-19 burden reduces the size of manufacturing in an exporting nation, resulting in a reduction in export supply. Exports will fall, especially in industries and countries where remote work/operations are difficult. The COVID-19 burden in surrounding nations may effect a country's foreign trade. For example, export opportunities for its neighbors arise as a result of a country's decreasing exports. On the other hand, COVID-19 induced negative production shocks in one nation may impair output in nearby countries via supply-chain networks.

3.3   Methodological Literature Review

Ajakaiye and Fakiyesi (2009) examines the global financial crisis discussion series. The study posited that the current global financial crisis, which was triggered by the credit crunch within the US sub-prime mortgage market, is continuing to spread and deepen in several countries. Its impact on Nigeria is evident in the performance of the Nigeria Stock Exchange and the financial system as well as in the real sector. Mark et. al., (2017) examined international trade and local labor markets: Do foreign and domestic shocks affect regions differently? He postulated that despite the attention given to international trade in discussion of the economic struggles of many US regions, it is unclear whether international trade shocks impact local economies more, or differently, than shocks originating within the domestic economy. The study used US county-level data for 1990–2010, and the study carefully constructs shocks to local economies, isolating those arising from international imports and exports to assess whether trade shocks have different effects from domestic shocks. He examined a variety of indicators including employment growth, population growth, employment rates, wage rates and poverty rates.

Starnini, Boguñá, and Serrano (2019) examines the interconnected wealth of nations: Shock propagation on global trade-investment multiplex networks. He asserts that one of the critical factors for the global propagation of economic crises is the increasing integration of world economies, which is organized in complex multilayer networks of interactions. They adopted the network science approach to quantify shock propagation on the global trade-investment multiplex network. They proposed a model that couples a spreading dynamic, describing how economic distress propagates between connected countries, with an internal contagion mechanism, describing the spreading of such economic distress within a given country. Hiebert, and Vansteenkiste, (2010) international trade, technological shocks and spillovers in the Labour market: a GVAR analysis of the us manufacturing sector. He analyzed the response of labour market related variables in the US manufacturing sector to various shocks, notably to trade openness and technology, as well as examining spillovers from industry-specific labour market shocks. The econometric approach involves an application of the recently developed Global Vector Autoregression methodology of Dées *et al*. (2007) to 12 manufacturing industries over the period 1977–2003.

Varona and Gonzales (2021) examined the dynamics of the impact of COVID-19 on the economic activity of Peru. The study evaluates that the impact is of twofold, which is both an external shock and internal shock and these shocks affect aggregate supply and aggregate demand. The study used an Autoregressive Distributed Lags (ARDL) model. The Wald test or F statistic in a generalized Dicky-Fuller regression was used to test the significance of lagged levels of the variables considered in an Error Correction Model (ECM) conditional equilibrium model. Additionally, Narayan tabulates critical values for sample sizes ranging from 30 to 80 observations, which are relevant to our research using limit tests with the cointegration approach. Faria-e-Castro, (2021) evaluates the effects of the 2020 coronavirus outbreak in the United States and subsequent fiscal policy response in a nonlinear DSGE model. This paper uses a calibrated version of the model that matches the path of the US unemployment rate in 2020 to analyze different types of fiscal policies. Ozili, (2020) examined COVID-19 pandemic and economic crisis: the Nigerian experience and structural causes. This paper uses simple descriptive analysis and to examine the COVID-19 situation in Nigeria.

McKibbin and Fernando (2020) examined the global macroeconomic impacts of COVID-19: seven scenarios. This paper explores seven plausible scenarios of COVID-19 and the macroeconomic outcomes using a global hybrid DSGE/CGE general equilibrium model. The G-cubed model is a hybrid of dynamic stochastic general equilibrium (DSGE) models and computable general equilibrium (CGE) models which was developed by

McKibbin and Wilcoxen (1999, 2013) and extended to the G20 countries by McKibbin and Triggs (2018). Using this model, we follow the approach to evaluating the economics of SARS (Lee and McKibbin, 2004) and pandemic influenza (McKibbin and Sidorenko, 2006) to explore a range of different scenarios for the spread of COVID-19. Barua, (2020) examined Understanding Coronanomics: The economic implications of the coronavirus (COVID-19) pandemic. The paper first presents a general and theoretical mapping of the likely macroeconomic impacts of the pandemic on an affected economy and then reviews the emerging evidence in relation to the impact mapping to understand the nature of the impacts. The paper then illustrates the likely impacts using a standard macroeconomic AD-AS model and outlines some necessary features that need to be considered while designing policy responses by governments and international institutions in mitigating the economic shocks.

Kazunobu, and Hiroshi (2020) examine the impacts of COVID-19 on international trade, we explore monthly data on worldwide trade from January to August in 2019 and 2020. Specifically, our study data include the exports of 34 countries to 173 countries. We estimated the gravity equation by employing various variables as a proxy for the COVID-19 damage. He regresses bilateral trade values on various measures for assessing the burden of COVID-19. Trade data covering a longer period will become available over time, but we decided to examine trade during this period because there had already been a serious number of COVID-19 cases and deaths by the end of March 2020, as shown in Figure 1. Also, some countries enacted entry bans on foreigners of specific nationalities from January 2020. Our dataset includes trade among 186 countries. Our use of worldwide data implies strong external validity of our results. We use the number of COVID-19 cases and deaths collected by the European Centre for Disease Prevention and Control as measures of disease burden to investigate the impacts of COVID-19 on international trade. Hassani and Shahwali (2020) examined the Impact of COVID-19 on international trade and China's trade. To determine the effects of COVID-19 on global trade, a comprehensive analysis was conducted on forty-two countries using computable general equilibrium (CGE) model. These components comprise things such as industries, governments, importers and exporters, investors, and households.

Marshal, Nwadochi, and Oriakpono, (2020) examined COVID-19 pandemic, global trade wars and impact on the Nigeria economy. This study adopts a descriptive research methodology to evaluate and assess COVID-19 pandemic, global trade wars and impact on the Nigeria economy as the single largest economic block in sub-Sahara Africa. Oyinlola, Osayomi, and Adeniyi (2020) examined the empirical modelling of confirmed COVID-19 cases in Nigeria: forecasts and implications. This paper explored the nature of the COVID-19 both in terms of the shape of its growth curve and then estimated the basic reproduction number on the one hand, while also providing forecast of the path of the pandemic, particularly the number of infections for Nigeria. The Poisson, Negative Binomial and Wallinga and Teunis (2004) modelling techniques were used on data from Nigeria. As at April 28, 2020, the COVID-19 curve for Nigeria was upward sloping in nature with the steepness becoming marked from around 30 March 2020.

Ozili and Arun (2020) empirically examine the impact of social distancing policies on economic activities and stock market indices. the study focuses on the period from the start of 2020 through March when the coronavirus began spreading into other countries and markets. We draw on real-world observations in assessing the restrictive measures, monetary policy measures, fiscal policy measures and the public health measures that were adopted during the period. John, (2020) examined a consideration of possible impacts of COVID-19 on financial markets and institutions, either directly or indirectly, is briefly outlined by drawing on a variety of literatures. A consideration of the characteristics of COVID-19, along with what research suggests have been the impacts of other past events that in some ways roughly parallel COVID-19, points toward avenues of future investigation.

Oladipo and Fabayo (2012) evaluates the global recession, oil sector and economic growth in Nigeria. This study investigates global recession and the oil sector, based on its effects on economic growth in Nigeria. The study used Ordinary Least Square (OLS) to analysis the effect of oil activities on gross domestic product between 1990-2006, data were sourced from the CBN Statistical Bulletin. For robustness of the work a unit root was conducted and a quarterly trend analysis was captured for the effect of global recession on oil sector between 2008-2009.

3.4   Empirical Literature Review

Adam and Ajakaiye (2011) observe that the spike in global food and fuel prices between 2006 and 2008 and the dislocation of trade that followed the global financial crisis brought a long period of relatively benign macroeconomic conditions to an abrupt halt, forcing authorities around the world to re-assess the reach and limits of macroeconomic management. To avoid distributional effects of large price movements, Adam and Ajakaiye (2011) advocates that structural and regulatory policies that reduce the prevalence and frequency of supply-side shocks should be put in place in Africa. While, Ajakaiye and Fakiyesi (2009) revealed that a negative oil price shock has negative impacts both in the short and medium term on growth items. The study showed that some of the stylized indicators include market capitalization, which fell by 45.8% in 2008; the crude oil price declined precipitously from US$147 per barrel in July 2008 to $47 per barrel in January 2009, leading to a decline in external reserves and hence accruable revenue. The debt profile is also increasing. Foreign portfolio investors have withdrawn over $15 billion, while remittances and official development assistance (ODA) are expected to fall greatly in 2009. Developmental goals will be unachievable with less budgetary allocation to social services, thus pushing a greater number of people further into poverty. Government responses to the crisis include reduction of the monetary policy rate (MPR) from 10.25-9.75%, of the cash reserve requirement (CRR) from 4.0-2.0% and of the liquidity ratio from 40.0-30.0%.

Mark et al. (2017) revealed that international trade shocks have some different effects than overall domestic shocks, though likely less than commonly perceived. They showed that domestic shocks dominate international trade shocks in explaining variation in regional labor market outcomes. They also revealed that the effect of export shocks on job growth is significantly negative in the pre-recession period, consistent with exports having lower positive employment shock impacts compared with common shocks, and positive during the recession (though only statistically significant in non-metro counties). Only pre-recession in non-metro counties is import shocks negatively related to total job growth. The negative link between population growth and export employment shocks existed through the decade, but the larger negative impact that import-specific shocks had on population growth did not exist in the Great Recession period. The declining magnitude of the industry mix shock coefficient between the two periods suggests that while the falling responsiveness of migration to employment shocks began pre-recession, it accelerated during the recession. The positive export shock coefficients on employment rates continue to suggest that people avoid export-intensive locations or did not out-migrate following negative shocks. For metro counties, export employment shocks were associated with differentially falling poverty rates both before and during the recession, but with rising poverty rates pre-recession and falling poverty rates during the recession for non-metro counties. Import shocks were associated with rising metro poverty rates pre-recession, but not during the recession, while there was no clear non-metro pattern.

Starnini, Boguñá and Serrano (2019) revealed that at the local level the interplay between trade and financial interactions influences the vulnerabilities of countries to shocks. At the large scale, we find a simple linear relation between the relative magnitude of a shock in a country and its global impact on the whole economic system, albeit the strength of internal contagion is country-dependent and the inter-country propagation dynamics is non-linear. Benguria and Taylor (2019) postulated that a shock in an epicenter country may be driven by different domestic or exogenous factors, such as COVID-19 pandemic, banking crisis, political instability, fiscal contraction, etc. and it is assumed that these shocks would cause a drop on aggregate demand. This implies that the epicenter country may reduce its imports from other countries and/or its investment in financial assets issued by other countries. While, Hiebert and Vansteenkiste (2010) revealed that the generalized impulse responses indicate that increased trade openness negatively affects real compensation, has negligible employment effects and leads to higher labour productivity. These impacts, however, are relatively weaker than those induced by technology shocks, with the latter positively and significantly affecting both real compensation and employment. He further revealed that technological shocks seem to have a more important labour market impact in the manufacturing sector over the period considered than do shocks to trade openness, in keeping with the broad thrust of existing literature. And also showed that there is also evidence of positive spillovers across industries from sector-specific employment and productivity shocks.

Varona, Gonzales (2021) revealed that a negative and statistically significant impact of the COVID-19 shock was found on the level of economic activity and a long-term Cointegration relationship with an error correction model (CEM), with the expected sign and statistically significant at 1%. The study showed that the impact of Covid-19 is twofold: an external shock and an internal shock that affect aggregate supply and demand. The study explains that the external shock implies a contraction in the prices of raw materials, in the demand for exports, employment, income, tourism, international remittances, and external financing. The internal shock, being of greater impact, is associated with the COVID-19 disease due to the suppression policy to prevent contagion (quarantine), which affects employment and aggregate supply and, therefore, affects aggregate demand through lower consumption and savings or debt and private credit in the short-term; and lower investment and capital accumulation in the long-term, which is evident in the dynamics of economic activity. In line with this, Faria-e-Castro, (2021) showed that the pandemic causes a 40 percent drop in employment in the services sector and a 15 percent contraction in GDP during the first three months of the pandemic, followed by a slow recovery. He al revealed that the most effective tool to stabilize household income and borrower consumption in the context of an exogenous shock that leads to the shutdown of the services sector is an increase in UI benefits.

Ozili (2020) showed that the economic downturn in Nigeria was triggered by a combination of declining oil price and spillovers from the COVID-19 outbreak, which not only led to a fall in the demand for oil products but also stopped economic activities from taking place when social distancing policies were enforced. The government responded to the crisis by providing financial assistance to businesses and a small number of households that were affected by the coronavirus (COVID-19) outbreak. The monetary authority adopted accommodative monetary policies and offered a targeted 3.5 trillion loan support to some sectors. These efforts should have prevented the economic crisis from occurring but it did not. Economic agents could not freely engage in economic activities for fear of contracting the COVID-19 disease that was spreading very fast at the time. Also, McKibbin and Fernando (2020) revealed that the results demonstrate that even a contained outbreak could significantly impact the global economy in the short run. Economic costs could be significantly avoided with greater investment in public health systems in all economies, particularly in economies where health care systems are less developed and population density is high.

John (2020) revealed that the COVID-19 crisis is informing investors, policy makers and the public at large that natural disasters can inflict economic damage on a previously unprecedented scale. Unlike events such as global nuclear war, which is not survivable and so of no relevant cost, or events such as climate change that are much slower moving, or localized disasters that create spillover and market reactions, the COVID-19 pandemic is causing a direct global destructive economic impact that is present in every area of the globe. All parties must now face what has already been obvious to many that such phenomenons are imminently possible and indeed likely. The COVID-19 pandemic has been compared with the Great Depression in the 1930s in the US and the financial effects have been likened to the Global Financial Crisis of 2007-2009. The community of finance and economics scholars rapidly responded to the urgent need for research on the impact of pandemics

Barua (2020) revealed that COVID-19 is jeopardizing economies - no matter large or small, developed or developing. As of today, end to this pandemic remains uncertain. The uncertainty is causing loss of public confidence worldwide. The macroeconomic impacts in any economy are likely to worsen across economies, if consumer and producer confidence is lost and a powerful demand shock coupled with massive supply-side supports cannot be implemented in a timely manner. He further revealed that as evidence of economic adversities emerge, it would be wise to begin from now designing and implementing aggressive and innovative policy actions with a longterm perspective to prevent the looming. Or, if someone waits for the pandemic to end before taking effective measures, it might too late and an economic depression might become inevitable and unavoidable.

Kazunobu and Hiroshi (2020) revealed that first, regardless of our measures to quantify the COVID-19 pandemic, we found significantly negative effects of COVID-19 on the international trade of both exporting and importing countries. Second, those effects, especially the effects of COVID-19 in importing countries, tended to become insignificant since July 2020. This result implies that the harmful impacts of COVID-19 on international trade were accommodated after the first wave of the pandemic to some extent. Third, we found heterogeneous

effects across industries. The negative effects on non-essential, durable products persist for a long time, whereas positive effects in industries providing medical products were observed.

Hassani and Shahwali (2020) revealed that the impact of COVID-19 on GDP has been predicted under two scenarios. These are the short and long containment scenarios. Under the short containment scenario, global trade will be cut by about 905 billion US Dollars. Global trade will be cut by 2,095 billion US Dollars under the long containment scenario. From the simulation, growth in GDP will fall by 5.4 % under the short containment scenario growth in GDP will fall by 3.7 % in Asia and by 2.8 % in the world, Asia is expected to contribute the most to the general decline in global output by a figure of 48 %. COVID-19 will impact wage income most in the EU, UK, and the US. On a global scale, labor income will fall by 535 billion US Dollars under the short containment scenario. Labor income will fall by 1053 billion US Dollars under the long containment scenario. China is the core of export and import in Asia and COVID-19 could affect the Asia negatively so it could be concluded that COVID-19 could affect the China's trade indirectly during the COVID-19.

Marshal, Nwadochi and Oriakpono (2020) revealed that corona virus is crippling the Nigeria economy in term of social, religious and economic activities. The study concludes that the measures taken to contain the spread of COVID-19 have impacted households in Nigeria in many ways such as job loss, loss of remittances, higher prices, rationing of food and other basic goods and disruptions to health care services and education. For the poor who are more vulnerable for several reasons were impacted almost immediately. Oyinlola, Osayomi and Adeniyi (2020) revealed that it was about the same period that the government ordered the lockdown of the epicenters of the pandemic. Also, the basic reproduction number was both time variant and relatively high for the national (2.25) and sub-national [Lagos (3.44) and Abuja (2.77)] cases. The projections from the two standard models suggested that the incidence of infections may just begin to taper off by the end of the second quarter before stabilizing at about the third quarter of 2020. Ozili and Arun (2020) revealed that the increasing number of lockdown days, monetary policy decisions and international travel restrictions severely affected the level of economic activities and the closing, opening, lowest and highest stock price of major stock market indices. In contrast, the imposed restriction on internal movement and higher fiscal policy spending had a positive impact on the level of economic activities, although the increasing number of confirmed coronavirus cases did not have a significant effect on the level of economic activities.

Baldwin and Tomiura (2020) revealed that there is a danger of permanent damage to the trade system driven by policy and firms' reactions. The combination of the US' ongoing trade war against all of its trading partners (but especially China) and the supply-chain disruptions that are likely to be caused by COVID-19 could lead to a push to repatriate supply chains. Exclusively depending on suppliers from any one nation does not reduce risk, it increases it. In Japan, for example, it would not only escalate costs but also expose production to the risk that the next earthquake could be bigger than that of 2011; such a quake is predicted to occur with high probability sometime in the next century. We should not misinterpret pandemic as a justification for anti-globalism. Redundant dual sourcing from multiple countries alleviates the problem of excess dependence on China, though with additional costs. Japanese multinationals have already begun diversifying the destinations of foreign direct investment away from China in recent years, not foreseeing COVID-19 but prompted by Chinese wage hikes. We hope more intensive use of ICT enables firms to more effectively coordinate global sourcing. Finally, Oladipo and Fabayo (2012) reveals that there was a negative relationship between GDP and oil produced (domestic consumption and export) which is significant at 5% lever of significance i.e. (P < 0.05). The result also showed that there exists decline in the oil sector due to the global recession despite all measures given by government to curb it effects.

3.5   Theoretical Framework

The theoretical framework for this study is built on the Endogenous growth model developed by Romer (1990), Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995) which was then espoused by Borensztein et al. (1998) and Chamlagai (2015). Endogenous growth theory holds that investment in human capital, population growth, innovation, and knowledge are significant contributors to economic growth. The endogenous growth theory provided a new look at what drives economic growth. It contended that internal factors such as human

capital, innovation, and investment capital, rather than external, uncontrollable forces, are responsible for a stable rate of prosperity, contradicting neoclassical economic theory.

Assumptions of Endogenous Growth Model

- The model assumes that there are no decreasing returns to scale in the production function. Various justifications have been offered for this assumption, including positive spillovers from capital investment to the economy as a whole or technological advancement leading to even more advancements.
- The model considers changes to technology to be endogenous. Therefore, technological advancements lead to economic improvements.
- The model also assumes that innovative ideas are a very important part of economic growth. Combining improvements to human capital and existing knowledge can create innovative ideas to enhance the production of goods in an economy.
- There are increasing returns to scale by investing in human capital through education or training programs. Doing so can improve the quality of labor, which increases productivity.
- Investments should also be made to improve infrastructure and manufacturing processes in order to achieve innovation in production.

The relevance of endogenous growth model to this study is from the understanding that economic growth is primarily the result of internal forces, rather than external ones. It argues that improvements in productivity can be tied directly to faster innovation and more investments in human capital from governments and private sector institutions. The theory notes that the enhancement of a nation's human capital will lead to economic growth by means of the development of new forms of technology and efficient and effective means of production. But the COVID-19 pandemic is having an unprecedented disruptive effect on human capital leading to significant economic costs (e.g., decline in firm output, output price increases, etc.) (Deng, et. al., 2021). Due to this COVID-19 is seen as a shock that has negatively impacts on human capital and has also significantly impacted negatively on innovation and knowledge (R and D) which in turns impact on economic growth and international trade.

RESEARCH METHODOLOGY AND EMPIRICAL RESULTS

4.1   Introduction

This chapter presents the research methods employed and empirical results in this research work. Research methods are the strategies, processes or techniques used in collecting data or evidence for analysis in order to uncover new knowledge or create better understanding of a topic. The model specification, key variable, data sources used for the empirical analysis are discussed.

The results of the empirical analysis of the data obtained are presented as well in this chapter. This provides the findings of structural var model, impulse response, variance decomposition and granger causality test.

4.2 The Research Methodology

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In other words, research methodology is a collection of research techniques that are used in a systematic manner. This is simply a guide to research and how it is carried out. It explains and analyzes techniques, elucidates their limitations and resources, clarifies their assumptions and implications, and connects their potentialities to the liminal zone at the edge of knowledge. The research methodology presents several aspects of the methodology used, which includes the model specification, key variables, data sources and measurement as well as the technique of estimation.

From the theoretical framework discussed, endogenous growth model for Nigeria is specified as follows:

$$G_t = f(HC_t, POPU_t, RandD_t, EXP_t, IMP_t) \qquad (4.1a)$$

$$GDP_t = \alpha_0 + \alpha_1 HC_t + \alpha_2 POPU_t + \alpha_3\ RandD_t + \alpha_4\ EXP_t + \alpha_5\ IMP_t + \varepsilon_t \qquad\text{(4.1b)}$$

Equation 4.1a and 4.1b, indicates that the economic growth is a function of human capital (HC), population growth (POPU), innovation, knowledge (R and D), export (EXP), and import (IMP).

The COVID-19 pandemic is having an unprecedented disruptive effect on human capital in labour markets, leading to significant economic costs (e.g., decline in firm output, output price increases, etc.) (Deng et al., 2021). In line with this, Nguyen (2021) and Marek, et. al., (2020) posited that the COVID-19 outbreak has generated unprecedented disruptions to the global economies, and has led to income loss and high unemployment rates and as such, COVID 19 pandemic stands as a factor that can affect economic growth.

It is also important to note that during COVID 19, trade restrictions (export and import) between countries were part of the measure put in place to reduce the impact of the pandemic on vulnerable countries (Obayelu, (2020). He further posited that trade (export and import) restrictions implemented in Africa and elsewhere in to the pandemic are igniting fears of a new food crisis on the continent. In line with this, Elleby et al. (2020) postulated that the pandemic has affected trade of goods through borders closure, import and export restrictions to protect domestic consumers. Hence,

$$GDP_t = \alpha_0 + \alpha_1 COVID_t + \alpha_2\ EXP_t + \alpha_3\ IMP_t + \alpha_4\ INF_t + \varepsilon_t \qquad\text{(4.1e)}$$

Where:

GDP = Gross Domestic Product

COVID = COVID-19 Pandemics

EXP = exports

IMP = Imports

INF = Inflation

Equation 4.1e indicates that the economic growth (GDP) is a function of COVID-19 pandemic (COVID), international trade (export and import) and other variable.

4.2.1 Model Specification

The choice of which independent variables should be included in or deleted from a regression equation is referred to as model specification. In general, rather than empirical or methodological factors, the specification of a regression model should be based primarily on theoretical considerations (Lancsar, 2017). From the theoretical framework discussed, two model will be specified based on the objective on the objective of the study.

The objective one: to estimate the impact of COVID 19 shock on economic growth and international trade in Nigeria will be analyzed and in order to achieve this, the structural VAR model is specified. While the objective two: to examine the causal relationship between international trade and economic growth in Nigeria and in order to achieve this, granger causality test is specified.

Objective One: THE STRUCTURAL VECTOR AUTOREGRESSION (SVAR)

A structural VAR model is employed to investigate the impact of COVID-19 pandemic on economic growth and international trade. the study is modelled using the Structural Vector Autoregressive model (SVAR) model. The SVAR is an extension of Vector Autoregressive (VAR) framework as it is dependent on theory unlike the VAR model. Structural VAR is a variant of the unrestricted VAR, which is a method for forecasting numerous variables in a system. The structural VAR, imposes key restrictions that set conditions as to how certain variables would behave. This model presented in this section, so as to achieve the set objectives of this study as shown in equation 4.1e and 4.1f which shows the impact of COVID 19 shock on international trade and economic growth.

And shows the relationship between economic growth, international trade, COVID-19 pandemic and other variables to be employed in this study are specified in general form.

$$GDP_t = \alpha_0 + \alpha_1 COVID_t + \varepsilon_t \qquad (4.1e)$$

$$T_t = \alpha_0 + \alpha_1 COVID_t + \alpha_2 EXP_t + \alpha_3 IMP_t + \alpha_4 INF_t + \varepsilon_t \qquad (4.1f)$$

From equation 4.1e and 4.1f, uncertainty due to pandemics and epidemics (UP) stands as a proxy or measure of COVID 19 pandemic (Altig, 2020). And this gives room for enough observations to permit meaningful time series analysis and economic growth (G) stands as a proxy for gross domestic product (GDP), international trade (T) calculated as the sum of exports and imports as a share of GDP, EXPORT (EXP), IMPORT (IMP) and it is assumed that Inflation (INF) is taken as control variables.

In a typical SVAR model, this index along with other variables in a recursive structural VAR model and this will permit us to obtain coefficients along with impulse responses on the impact of COVID-19 pandemic and also allows us to capture both the contemporaneous (i.e immediate response in a variable due the changes in other variable) and dynamic effect (lag effect).

Then, considering the variables in the study as the endogenous variables, we can specify a multivariate SVAR model as:

$$COVIDP_t = \alpha_1 + \beta_{11} COVID_{t-1} + \gamma_{12} IMP_{t-1} + \delta_{13} EXP_{t-1} + \rho_{14} GDP_{t-1} + \varphi_{15} INF_{t-1} + \gamma_{12} IMP_t$$
$$+ \delta_{13} EXP_t + \rho_{14} GDP_t + \varphi_{15} INF_t + \varepsilon_{1t}$$

$$IMP_t = \alpha_2 + \beta_{21} COVID_{t-1} + \gamma_{22} IMP_{t-1} + \delta_{23} EXP_{t-1} + \rho_{24} GDP_{t-1} + \varphi_{25} INF_{t-1}$$
$$+ \beta_{21} COVID_t + \delta_{23} EXR_t + \rho_{24} GDP_t + \varphi_{25} INF_t + \varepsilon_{2t}$$

$$EXP_t = \alpha_3 + \beta_{31} COVID_{t-1} + \gamma_{32} IMP_{t-1} + \delta_{33} EXP_{t-1} + \rho_{34} GDP_{t-1} + \varphi_{35} INF_{t-1}$$
$$+ \beta_{31} COVID_t + \gamma_{32} IMP_t + \rho_{34} GDP_t + \varphi_{35} INF_t + \varepsilon_{3t} \qquad (4.2)$$

$$GDP_t = \alpha_4 + \beta_{41} COVID_{t-1} + \gamma_{42} IMP_{t-1} + \delta_{43} EXP_{t-1} + \rho_{44} GDP_{t-1} + \varphi_{45} INF_{t-1} + \beta_{41} COVID_t$$
$$+ \gamma_{42} IMP_t + \delta_{43} EXP_t + \varphi_{45} INF_t + \varepsilon_{4t}$$

$$INF_t = \alpha_5 + \beta_{51} COVID_{t-1} + \gamma_{52} IMP_{t-1} + \delta_{53} EXP_{t-1} + \rho_{54} GDP_{t-1} + \varphi_{55} INF_{t-1}$$
$$+ \beta_{51} COVID_t + \gamma_{52} IMP_t + \delta_{53} EXP_t + \rho_{54} GDP_t + \varepsilon_{5t}$$

Collecting like term of equation 4.2

$$COVID_t - \gamma_{12} IMP_t - \delta_{13} EXP_t - \rho_{14} GDP_t - \varphi_{15} INF_t = \alpha_1 + \beta_{11} COVID_{t-1} + \gamma_{12} IMP_{t-1} + \delta_{13} EXP_{t-1} + \rho_{14} GDP_{t-1} + \varphi_{15} INF_{t-1} + \varepsilon_{1t}$$

$$- \beta_{21} COVID_t + IMP_t - \delta_{23} EXP_t - \rho_{24} GDP_t - \varphi_{25} INF_t$$
$$= \alpha_2 + \beta_{21} COVID_{t-1} + \gamma_{22} IMP_{t-1} + \delta_{23} EXP_{t-1} + \rho_{24} GDP_{t-1} + \varphi_{25} INF_{t-1}$$
$$+ \varepsilon_{2t}$$

$$- \beta_{31} COVID_t - \gamma_{32} IMP_t + EXP_t - \rho_{34} GDP_t - \varphi_{35} INF_t$$
$$= \alpha_3 + \beta_{31} COVID_{t-1} + \gamma_{32} IMP_{t-1} + \delta_{33} EXP_{t-1} + \rho_{34} GDP_{t-1} + \varphi_{35} INF_{t-1}$$
$$+ \varepsilon_{3t} \qquad (4.3)$$

$$- \beta_{41} COVID_t - \gamma_{42} IMP_t - \delta_{43} EXP_t + GDP_t - \varphi_{45} INF_t$$
$$= \alpha_4 + \beta_{41} COVID_{t-1} + \gamma_{42} IMP_{t-1} + \delta_{43} EXP_{t-1} + \rho_{44} GDP_{t-1} + \varphi_{45} INF_{t-1} + \varepsilon_{4t}$$

$$- \beta_{51} COVID_t - \gamma_{52} IMP_t - \delta_{53} EXP_t - \rho_{54} GDP_t + INF_t$$
$$= \alpha_5 + \beta_{51} COVID_{t-1} + \gamma_{52} IMP_{t-1} + \delta_{53} EXP_{t-1} + \rho_{54} GDP_{t-1} + \varphi_{55} INF_{t-1} + \varepsilon_{5t}$$

Converting the above equation 4.3 into a form matrix to give 4.4

$$\begin{vmatrix} 1 & -\gamma_{12} & -\delta_{13} & -\rho_{14} & -\varphi_{15} \\ -\beta_{21} & 1 & -\delta_{23} & -\rho_{24} & -\varphi_{25} \\ -\beta_{31} & -\gamma_{32} & 1 & -\rho_{34} & -\varphi_{35} \\ -\beta_{41} & -\gamma_{42} & -\delta_{43} & 1 & -\varphi_{45} \\ -\beta_{51} & -\gamma_{52} & -\delta_{53} & -\rho_{54} & 1 \end{vmatrix} \begin{vmatrix} COVID_t \\ IMP_t \\ EXP_t \\ GDP_t \\ INF_t \end{vmatrix} = \begin{vmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \end{vmatrix} + \begin{vmatrix} \beta_{11} & \gamma_{12} & \delta_{13} & \rho_{14} & \varphi_{15} \\ \beta_{21} & \gamma_{22} & \delta_{23} & \rho_{24} & \varphi_{25} \\ \beta_{31} & \gamma_{32} & \delta_{33} & \rho_{34} & \varphi_{35} \\ \beta_{41} & \gamma_{42} & \delta_{43} & \rho_{44} & \varphi_{45} \\ \beta_{51} & \gamma_{52} & \delta_{53} & \rho_{54} & \varphi_{55} \end{vmatrix} \begin{vmatrix} COVID_{t-1} \\ IMP_{t-1} \\ EXP_{t-1} \\ GDP_{t-1} \\ INF_{t-1} \end{vmatrix} + \begin{vmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \end{vmatrix}$$

This contains the matrix of contemporaneous effect

This contains the matrix of dynamic effect

This requires imposing restriction on the matrix of contemporaneous effects. The formula used in determining the number of restrictions is given as:

$\frac{n(n-1)}{2}$; Where n is the number of endogenous variables in the SVAR model.

Since, n= 5; $\frac{5(5-1)}{2} = \frac{5(4)}{2} = \frac{20}{2} = 10$,

We are going to impose restriction on the contemporaneous effects. Therefore, it is assumed that shocks are propagated in the order indicated in equation (4.5), hence, we restrict $\gamma_{12}, \delta_{13}, \rho_{14} \; \varphi_{15}, \delta_{23}, \rho_{24}, \varphi_{25}, \varphi_{34}, \varphi_{35}, \varphi_{45}$ to zero.

$$\begin{vmatrix} 1 & 0 & 0 & 0 & 0 \\ -\beta_{21} & 1 & 0 & 0 & 0 \\ -\beta_{31} & -\gamma_{32} & 1 & 0 & 0 \\ -\beta_{41} & -\gamma_{42} & -\delta_{43} & 1 & 0 \\ -\beta_{51} & -\gamma_{52} & -\delta_{53} & -\rho_{54} & 1 \end{vmatrix} \begin{vmatrix} COVID_t \\ IMP_t \\ EXP_t \\ GDP_t \\ INF_t \end{vmatrix} = \begin{vmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \end{vmatrix} + \begin{vmatrix} \beta_{11} & \gamma_{12} & \delta_{13} & \rho_{14} & \varphi_{15} \\ \beta_{21} & \gamma_{22} & \delta_{23} & \rho_{24} & \varphi_{25} \\ \beta_{31} & \gamma_{32} & \delta_{33} & \rho_{34} & \varphi_{35} \\ \beta_{41} & \gamma_{42} & \delta_{43} & \rho_{44} & \varphi_{45} \\ \beta_{51} & \gamma_{52} & \delta_{53} & \rho_{54} & \varphi_{55} \end{vmatrix} \begin{vmatrix} COVID_{t-1} \\ IMP_{t-1} \\ EXP_{t-1} \\ GDP_{t-1} \\ INF_{t-1} \end{vmatrix} + \begin{vmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \end{vmatrix} \quad (4.5)$$

Contemporaneous Effects

The below table shows the contemporaneous variables which are been treated as explanatory variables, which is particularly important when the frequency of the data is relatively long (i.e. quarterly). In addition, these models also allow for one to impose several highly specific restrictions on the parameters in the coefficient and residual covariance matrices. This would allow for one to evaluate the effect of an independent shock, when the off-diagonal elements in the residual covariance matrix are set to zero.

Table 4: Contemporaneous Effects

	COVID-19	IMP	EXP	GDP	INF
COVID-19	1	0	0	0	0
IMP	β_{21}	1	0	0	0
EXP	β_{31}	γ_{32}	1	0	0
GDP	β_{41}	γ_{42}	δ_{43}	1	0
INF	β_{51}	γ_{52}	δ_{53}	ρ_{54}	1

The above table shows that import (IMP), export (EXP), GDP, and inflation (INF) responds to COVID-19 pandemic (COVID) respectively; export (EXP), economic growth (GDP), and inflation (INF) responds to import (IMP); Growth rate (GDP), and inflation (INF) responds to export (EXP); while inflation (INF) responds to economic growth (GDP).

Objective Two: GRANGER CAUSALITY TEST

The neoclassical augmented growth model developed by Mankiw et al. (1992) cited by Zahonogo, (2016) is utilized to estimate the causal relationship between trade and economic growth. Two main motivations underlie the specification of this model. First, the model considers human capital, which enhances labor productivity and can boost growth. Second, as the objective is to see how economic growth is influenced by trade, several policy-related variables are used in the equation. Taking into account the variable of interest (trade) and the heterogeneity of the coefficients, the model can be expressed as follows:

$$\Delta GDP_t = \alpha + \beta Trade_t + \sum_{i=1}^{m} \delta \Delta Trade_{t-1} + \sum_{j=1}^{m} \theta \Delta GDP_{t-1} + \mu_t$$

$$\Delta Trade_t = \alpha + \beta YGDP_t + \sum_{i=1}^{m} \delta \Delta GDP_{t-1} + \sum_{j=1}^{m} \theta \Delta Trade_{t-1} + \mu_t$$

It is important to note that the causality test is only valid if all the series in the series in the traditional VAR model are stationary and this necessitated that we conducted two stationarity tests which are the Augmented Dickey–Fuller test (ADF) and Phillips-Perron test. In other words, unit root test is required for causality analysis and so stationarity is a precondition for causality analysis.

4.2.2 Key Variables

The gross domestic product (GDP): measures of national income and output for a given country's economy. The gross domestic product (GDP) is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time. It enters the model as measure of economic growth.

COVID-19 pandemic shock: is a significant source of Uncertainty which are due to pandemic or epidemics (UP)

International trade (T): it is calculated as the sum of exports and imports as a share of GDP and is the exchange of goods and services between countries. Trading globally gives consumers and countries the opportunity to be exposed to goods and services not available in their own countries, or more expensive domestically.

Inflation rate (INF): is the rate at which the value of a currency is falling and, consequently, the general level of prices for goods and services is rising.

4.2.3   Data Sources and Measurement

So as to achieve the objectives of this research work, the study employs the use of a quarterly time series data set of Nigeria from 1988 to 2020 which is of 32 observations. The basis of choosing the period with 32 observations is based on literature that specified that any period which has more than 30 observations is large enough to give accurate result. In our empirical analysis, the natural logarithm of Real GDP, Uncertainty due to pandemic and epidemics (UP), import (IMP), export (EXP) and inflation (INF) were taken. This has been identified to aid interpretation of result, compact result presentation also significantly reduces heteroskedasticity (Enders, 2004). FRED, Federal Reserve Bank of St. Louis for 2020 and the World Development Indicators of 2019 were the major sources of data used for this study.

4.3   Pre-Estimation Test

4.3.2   Unit Root Test

Before the SVAR was estimated, the unit root test was conducted to examine the stationary property of the series. In doing so, the Augmented Dickey Fuller (ADF) unit root test was used and due to some researchers' reservations about ADF test, Philips-Perron unit root test was also used to confirm the result of the ADF test. The result is presented in the following table.

Table 5: ADF Unit Root Tests

Variable	t-statistics	Critical value @ 5%	Prob*	Order of Integration
GDP_GROWTH	-3.535212	-2.883073	0.0085	I (1)
COVID	-10.64974	-2.881978	0.0000	I (1)
EXP	-3.793717	-2.882910	0.0038	I (1)
IMP	-3.297259	-2.882910	0.0169	I (1)
INF	-3.965442	-2.883073	0.0022	I (1)

Source: Authors' Computation from E-views 12

Table 6: Phillips-Perron Unit Root Tests

Variable	t-statistics	Critical value @ 5%	Prob*	Order of Integration
GDP_GROWTH	-8.990911	-2.881830	0.0000	I (1)
COVID	-15.33889	-2.881830	0.0000	I (1)
EXP	-3.572249	-2.8812279	0.0075	I (1)
IMP	-2.998520	-2.882279	0.0375	I (1)
INF	-5.776708	-2.881830	0.0000	I (1)

Source: Authors' Computation from E-views 12

The results as shown in Table 1 and 2 reveals that all the variables GDP_GROWTH, COVID, EXP, IMP, and INF, is integrated of order one which means these variables needs to be differenced once to be stationary. In other words, this means that the series have mean reverting ability, implying that any shock to the series will fizzle out with passage of time.

4.3.2 Lag Length Selection

The lag length selection is important for parsimonious specification. Therefore, all the automatic lag selection criteria were employed as presented in the following table.

Table 7: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1465.703	NA	3274.764	22.28338	22.39258	22.32776
1	-1312.673	292.1489	470.8120	20.34353	20.99871*	20.60977
2	-1300.051	23.24046	568.8558	20.53108	21.73224	21.01917
3	-1278.409	38.03793	600.9753	20.58195	22.32910	21.29191
4	-1181.117	163.6269	202.5255	19.48662	21.77976	20.41845
5	-1132.636	77.86321	143.6742*	19.13085*	21.96997	20.28454*
6	-1124.740	12.08299	189.6696	19.39001	22.77511	20.76556
7	-1112.935	17.17194	237.7785	19.58992	23.52101	21.18733
8	-1063.023	68.81816*	168.8782	19.21246	23.68954	21.03174

*Note: *indicates lag order selected by the criterion; LR: Sequential modified LR test statistics (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; and HQ: Hannan-Quinn information criterion.*
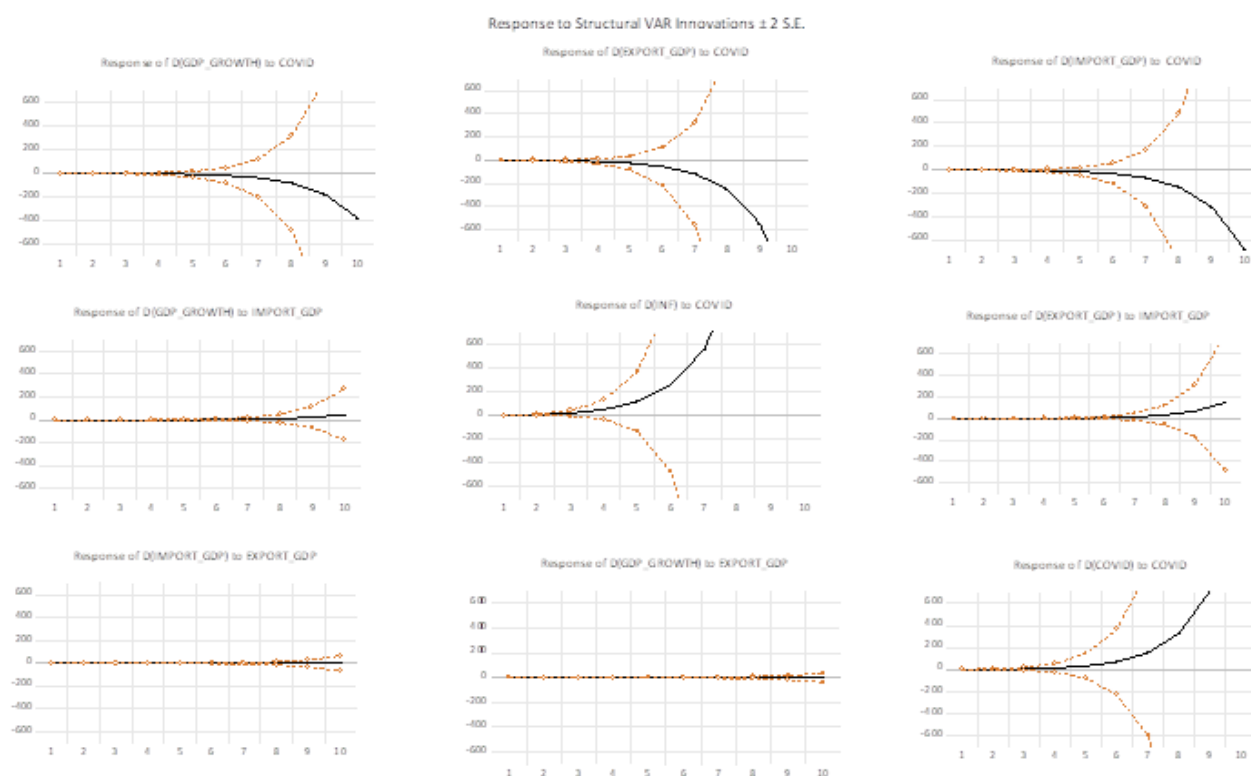
The lag order selection criteria as shown in Table 3 indicates that the optimal lag length is lag 6 as suggested by sequential modified LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), and Hannan-Quinn information criterion (HQ). Akaike information criterion (AIC) is the criteria that has the lowest value among all other criterion and as such lag 5 is selected. This indicates that SVAR (5) specification is the parsimonious model and plausible description of the quarterly data employed.

4.4   Estimation Test

4.4.1   Analysis of Impulse Responses Function

The impulse response function shows how a residual shock (COVID-19 shock) to one of the innovations in the model affects the contemporaneous and future values of all endogenous variables (Robalo and Salvado, 2008). Consequently, it plots the responses of GDP_GROWTH, EXP, IMP, and INF to COVID-19 shock in Nigeria.

Figure 8: Impulse Responses Function

Source: Authors' Computation from E-views 12

The ordering of the variables is important in the decomposition since it is equivalent to an identifying restriction on the primitive form of the VAR. Thus, we follow the orderings GDP_GROWTH, COVID, EXP, IMP, INF. In this case, the contemporaneously variables are ordered first. The impulse response functions show the direction, magnitude and the time path of COVID-19 emanating from economic growth, trade, inflation rate, and exchange rate.

The impulse response shows that a one standard deviation shock on COVID has a negative impact on economic growth. As we can see after the first quarter, when COVID increases one standard deviation shock resulted in a decrease in economic growth after the third quarter and the decrease became significant in the fourth quarter where it became negative and continue to decrease till the ten quarter. This shows that the impact of COVID-19 on economic growth (GDP_GROWTH) is significantly negative in Nigeria. In support of this is Jena, et. al., (2021), who revealed that the pandemic containment measures became increasingly stringent by mid-March 2020, the disruption of supply chains and slowing of economic activities became drastic and this impact strongly on economic growth.

The impulse response also shows that a one standard deviation shock on COVID has a significant negative impact on export in Nigeria. COVID increases one standard deviation shock which resulted in a decrease in export after the second quarter and the decrease became significant in the third quarter where it became negative and continue to decrease till the ten quarter. While COVID increases one standard deviation shock which resulted in a decrease in import after the third quarter and the decrease became significant in the fourth quarter where it became negative and continue to decrease till the ten quarter. This vividly shows that COVID-19 pandemic negatively impacted on international trade which is the sum of export and import as a share of GDP in Nigeria. In support of this, World Economic Outlook Update, (2019) posited that a significant decline in worldwide economic growth was already noted even before COVID-19, mainly due to the trade war between China and the United States and the steep decline in consumer expenditure. Also, Maliszewska, Mattoo, and Van Der Mensbrugghe, (2020), revealed that in his illustrative simulations of the shocks are identical across countries, and the deep recession under the amplified global pandemic scenario results in negative impacts on exports across all sectors and most destinations. He further revealed that the biggest negative shock is recorded in the output of domestic services affected by the pandemic, as well as in traded tourist services.

The impulse response function also revealed that inflation (INF) responds to COVID positively and the response of INF to COVID started in the second quarter and continued to increase positively. In line with this result, Apergis, and Apergis, (2021) revealed that inflation expectations and their volatility are positively affected by the Covid-19 pandemic. These results have real activity implications, while close monitoring of inflation expectations could signal inflation expectations un-anchoring risks. Also, Rodriguez and Atamanov (2021) revealed that poverty substantially increases, by up to 21 percentage points, as a combined result of the fall in household incomes and high inflation through the pandemic.

The impulse response function show that a one standard deviation shock on COVID has a significant negative impact on economic growth (GDP_GROWTH), international trade (Export and import) and a positive impact on inflation (INF).

4.4.2 Variance Decomposition

the variance decomposition displays the percentage of the error made forecasting a variable over time due to a specific shock. In other words, how much of the variability in the dependent variable is explained by its own shocks vs the shocks in the other variables in the system. As in the impulse response function, the variance decomposition applies the Choleski Decomposition for identification purposes.

Table 8: Variance Decomposition of D(GDP_GROWTH):

Period	S.E.	D(GDP_GROWTH)	D(COVID)	D(IMPORT_GDP)	D(EXPORT_GDP)	D(INF)
1	0.956306	100.0000	0.000000	0.000000	0.000000	0.000000
2	1.236033	79.50060	20.46971	0.015764	0.012576	0.001354
3	2.041925	32.35654	67.52085	0.080390	0.041587	0.000625
4	4.566966	6.770719	92.91020	0.150274	0.156514	0.012288
5	9.448565	2.064992	96.76076	1.094274	0.036591	0.043383
6	20.25053	0.490158	97.96383	1.508237	0.007993	0.029781
7	43.66831	0.117836	98.13533	1.713288	0.001806	0.031740
8	93.71693	0.032113	98.26562	1.669282	0.000408	0.032577
9	202.4348	0.008122	98.36394	1.594726	0.000490	0.032726
10	437.6902	0.004766	98.39915	1.561466	0.000601	0.034020

Table 9: Variance Decomposition of D(IMPORT_GDP):

Period	S.E.	D(GDP_GROWTH)	D(COVID)	D(IMPORT_GDP)	D(EXPORT_GDP)	D(INF)
1	0.765842	0.423024	0.667780	98.90920	0.000000	0.000000
2	1.242186	1.342389	34.46174	64.12507	0.001489	0.069305
3	3.044376	0.520215	84.91787	14.50918	0.000248	0.052486
4	6.988308	0.137920	95.98160	3.828582	0.003704	0.048191
5	15.80021	0.032708	98.56570	1.350632	0.005285	0.045674
6	35.68568	0.009502	98.75489	1.200391	0.001440	0.033778
7	77.31052	0.006861	98.62198	1.338506	0.000419	0.032230
8	166.6780	0.005950	98.48822	1.472506	0.000521	0.032807
9	359.9603	0.005480	98.40149	1.558756	0.000758	0.033518
10	776.3946	0.004813	98.39516	1.565171	0.000746	0.034108

Table 10: Variance Decomposition of D(EXPORT_GDP):

Period	S.E.	D(GDP_GROWTH)	D(COVID)	D(IMPORT_GDP)	D(EXPORT_GDP)	D(INF)
1	1.108255	0.439486	0.032808	14.87919	84.64852	0.000000
2	2.510393	0.260038	67.39165	5.064040	27.20165	0.082624
3	6.031651	0.061914	92.51538	1.522330	5.885062	0.015316
4	13.20078	0.013217	97.84807	0.783245	1.347933	0.007538
5	29.16970	0.003036	98.74888	0.949766	0.279950	0.018368
6	62.97127	0.004990	98.62465	1.279952	0.062639	0.027769
7	134.2316	0.005221	98.48513	1.462410	0.015527	0.031712
8	288.9145	0.004902	98.38457	1.572559	0.004280	0.033685
9	623.0508	0.004780	98.37206	1.587592	0.001307	0.034264
10	1344.405	0.004620	98.39222	1.568093	0.000764	0.034300

Table 11: Variance Decomposition of D(INF):

Period	S.E.	D(GDP_GROWTH)	D(COVID)	D(IMPORT_GDP)	D(EXPORT_GDP)	D(INF)
1	3.763974	0.585857	0.204692	0.275219	0.014166	98.92007
2	10.93919	0.206692	83.83099	0.123632	0.014593	15.82410
3	24.51468	0.042889	95.97622	0.050650	0.004743	3.925497
4	59.80362	0.007327	98.99942	0.147632	0.017919	0.827698
5	136.6888	0.007983	98.86938	0.934521	0.003645	0.184472
6	296.5249	0.005537	98.71166	1.215495	0.001597	0.065708

7	639.9271	0.004615	98.48384	1.470849	0.000837	0.039862
8	1383.329	0.004486	98.38982	1.570498	0.000583	0.034617
9	2983.805	0.004327	98.39312	1.567405	0.000601	0.034550
10	6442.940	0.004504	98.39961	1.560839	0.000657	0.034389
Cholesky Ordering: D(GDP_GROWTH) D(COVID) D(IMPORT_GDP) D(EXPORT_GDP) D(INF)						

Table 8 above, shows the variance decomposition of GDP_GROWTH (economic growth) and it indicate the effect of GDP_GROWTH, COVID, EXP, IMP, INF. Recall that the variance decomposition will be using the Choleski Decomposition for identification strategy and recall that COVID, EXP, IMP, INF has no contemporaneous effect in the first period on GDP_GROWTH, that is why we have COVID, EXP, IMP, INF been zero in the first period. Looking at the second period, we can see that the variation in GDP_GROWTH explains 20.46% on the changes in COVID and this variation increase to 98.39% in period 10, and this shows that COVID-19 negatively impacted on economic growth in Nigeria. IMPORT_GDP explains 0.015% on changes in GDP_GROWTH, EXPORT_GDP explains 0.012%, while INF explains 0.0013% on changes in GDP_GROWTH. Overtime as we can see that the impact of COVID overtime increases significantly. This means that changes in GDP_GROWTH has been impacted significantly by COVID and we can see that the impact of IMPORT_GDP increases overtime until period 7 where the variation declined from 1.713% to 1.561% in period 10, EXPORT_GDP increases until period 4 where the variation declined from 0.156% to 0.036% in period 3 and continued to decrease to 0.0006% in period 10, and while INF increased overtime.

From table 9, shows the variance decomposition of IMPORT_GDP and EXP, and INF been zero in the first period. Looking at the second period, we can see that the variation in IMPORT_GDP is due to 1.34% explained by GDP_GROWTH, COVID explains 34.46% on the changes in IMPORT_GDP, EXPORT_GDP explains 0.0014% on changes in IMPORT_GDP, while INF explains 0.069% on changes in IMPORT_GDP. Overtime as we can see that the impact of COVID overtime increases significantly. This means that changes in IMPORT_GDP has been impacted significantly by COVID and we can see that the impact of GDP_GROWTH declined drastically from 0.520% in period 3 to 0.0048% in period 10, EXPORT_GDP increases in period 4 and period 5 (i.e from 0.0037% to 0.0052% respectively) and then decrease significantly to 0.00074% in period 10, and while INF increased overtime significantly.

Conclusively, it can be seen that in period 10 the variation in GDP_GROWTH, EXPORT_GDP and IMPORT_GDP can be explained significantly by COVID. In other words, COVID explains 98.39% on the changes in GDP_GROWTH, COVID explains 98.395% on the changes in IMPORT_GDP while COVID explains 98.392% on the changes in EXPORT_GDP. This show that COVID-19 has impacted negatively and significantly on economic growth and has also impacted negatively on import and export level in Nigeria. As such we will reject the null hypothesis that there is no significant impact of COVID-19 on international trade (export and import) and economic growth in Nigeria. And therefore, conclude that there is a significant impact of COVID-19 on international trade (export and import) and economic growth in Nigeria.

4.4.3   Granger Causality Test

Grager causality test is concerned with short-run relationships between variables. This test involves examining whether the information provided by the lagged values of one variable allows for a more accurate prediction of another variable's present value.

The model was used in order to examine the Granger causal relationships between international trade and economic growth. As a testing criterion the probability value was used. The results relating to the existence of Granger causal relationships between international trade the sum of exports and imports as a share of GDP and economic growth appear in Table 5. If it is found that trade granger causes economic growth vice versa, trade could be used (albeit cautiously) to predict future movements in economic growth and vice versa.

Table 12: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: D(GDP_GROWTH)			
Excluded	Chi-sq	df	Prob.
D(TRADE)	17.10375	4	0.0018
All	17.10375	4	0.0018
Dependent variable: D(TRADE)			
Excluded	Chi-sq	df	Prob.
D(GDP_GROWTH)	14.67169	4	0.0054
All	14.67169	4	0.0054

Source: Authors' Computation from E-views 12

From the results of Table 4, shows that the p-value (0.0018) of trade chi-square (17.10375) is significant at 10% level of significance which therefore reveal that international trade (the sum of exports and imports as a share of GDP) granger causes economic growth while the p-value (0.0054) of economic growth chi-square (14.67169) is significant at 10% level of significance which reveals that economic growth granger causes international trade. That is, at 10% significant level economic growth granger causes international trade and vice versa.

This also reveals that there is a bidirectional relationship between international trade (export and import) and economic growth and as such they both dependent on each other. That is, Lagged values of international trade correlated with economic growth and vice versa. This implies that they both help to predict each other. Therefore, reject null hypothesis and conclude that economic growth granger causes international trade and international trade granger causes economic growth.

4.5   Discussion OF Findings

The Augmented Dickey Fuller (ADF) unit root test shows that all variables of the model are stationary at first difference and Philips-Perron unit root test was also conducted to confirm the result from the ADF test. The lag length selection indicated that the optimal lag length is lag 5 as suggested by sequential modified LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), and Hannan-Quinn information criterion (HQ). Akaike information criterion (AIC) is the criteria that has the lowest value among all other criterion and as such lag 5 is selected. This indicates that SVAR (5) specification is the parsimonious model and plausible description of the quarterly data employed.

The impulse response shows that the impact of COVID-19 on economic growth (GDP_GROWTH) was significantly negative. This can be confirmed from the result of variance decomposition which revealed that the variation in GDP_GROWTH explains 20.46% on the changes in COVID-19 (COVID) in the second period and this increased overtime to 98.39% in period 10, which caused economic growth (GDP_GROWTH) to decline from 100% in the first period to 0.004% in period 10. Therefore, this result revealed that the impact of COVID-19 is highly significant and negative on economic growth in Nigeria. This result corroborates the submission of Jena et al. (2021), who revealed that the pandemic containment measures became increasingly stringent by mid-March 2020, the disruption of supply chains and slowing of economic activities became drastic and this impact strongly on economic growth. He further revealed that the forecasted GDP figures show that the April-June quarter of the current year experienced sharp declines in GDP for all countries. Moreover, the annualized GDP growth is expected to reach double-digit negative growth rates. This is in contradiction with the result of McKibbin and Fernando (2020), he revealed that the impact on GDP for the whole year following the pandemic is much less, at around 1% or 2%, partly because output after the pandemic quarter is higher as firms replenish diminished stocks and meet postponed demand.

The result from the impulse response and variance decomposition shows that there is a significant impact of COVID-19 on import and export and this result showed that changes in import (IMPORT_GDP) declined drastically from 0.520% in period 3 to 0.0048% in period 10, export (EXPORT_GDP) increases in period 4 and period 5 (i.e. from 0.0037% to 0.0052% respectively) and then decrease significantly to 0.00074% in period 10. This also showed that export is more impacted negatively by COVID-19 than it was by import and this can be vividly seen in period 10 of the variance decomposition.

The impact of COVID-19 on import and export was highly significant owing to the closure of intercountry trade and border closure caused by the restriction implements by countries of the world to further curb the spread of the pandemic. In support of this is Maliszewska, Mattoo, and Van Der (2020), he revealed that in his illustrative simulations of the shocks are identical across countries, and the deep recession under the amplified global pandemic scenario results in negative impacts on exports across all sectors and most destinations. He further revealed that the biggest negative shock is recorded in the output of domestic services affected by the pandemic, as well as in traded tourist services. Also, this result corroborates the submission of World Economic Outlook Update, (2019) posited that a significant decline in worldwide economic growth was already noted even before COVID-19, mainly due to the trade war between China and the United States and the steep decline in consumer expenditure.

The result from the granger causality test reveals that there is a bidirectional relationship between international trade and economic growth and as such, are both dependent on each other. That is, international trade is significant predictor of economic growth and economic also a predictor of international trade in Nigeria. In other words, the lagged values of international trade correlated with economic growth and vice versa. This implies that they both help to predict each other. In support with this result, Vidya and Prabheesh (2020) revealed that the COVID-19 pandemic has severely hit trade interconnectedness of countries such as Germany, Italy, France, USA, UK as these countries show a steep reduction in degree centrality. His study also revealed that there has been more than 50% reduction in the trade density among the countries in the network in 2020 Q1 compared to the 2018. In support of the result of this study, Cao et al. (2020) shows that China's agricultural exports have been negatively impacted in the short-term, mostly due to the disruption of the supply chain. Also, he reveals that the outbreak of the COVID-19 pandemic adds significant uncertainty to agricultural trade, giving rise to serious concerns regarding its potential impact.

We conclude that there is a significant impact of COVID-19 shock on economic growth and international trade in Nigeria and in support of this is Maliszewska, Mattoo, and Van Der (2020), Vidya and Prabheesh (2020), Vidya and Prabheesh (2020), and World Economic Outlook Update, (2019) among other.

SUMMARY, RECOMMENDATION AND CONCLUSION

5.1   Summary

This research study focuses on the impact of COVID-19 shock on economic growth and international trade in Nigeria. It also looks at the transmission channels through which the shock (covid-19 pandemic) adversely affects the Nigerian economy like aggregate supply and demand, price level, exchange rate, and employment and income.

The study examined the impact of COVID-19 on international trade and economic growth and also to examine the causal relationship between economic growth and international trade.

To achieve these objectives of the study, a comprehensive analysis was conducted using a recursive structural vector autoregressive (SVAR) model and Granger Causality Test. In the model, economic growth and international trade was the dependent variable and the independent variables were COVID-19 pandemic, while exchange rate and inflation are control variable. After the review of relevant literature and the necessary empirical analyses it was observed that all independent variables (COVID-19 pandemic, exchange rate and inflation) have a significant impact on economic growth and international trade. The result shows that COVID-19 significantly impacted negatively on economic growth and international trade in Nigeria. The result also shows that there exists a bidirectional relationship between international trade and economic growth in Nigeria.

5.2   Recommendations

For the purpose of this research work, the following strategies are suggested to enhance the Cushing the impact of COVID-19 on international trade and economic growth in Nigeria.

Based on the empirical findings, the study makes the followings policy recommendations:

i.   The government, should bring up policies that will create a conducive environment that enable more export activities.

ii.   There is a need for global collaboration not just on health, but also on trade, finance and macroeconomic policies. Fortunately, global institutions are beginning to catalyze and coordinate global efforts, as well as to provide technical and financial support to countries coping with the health and economic consequences of the outbreak.

iii.   Diversification of Nigerian economy should be harnessed, because diversification will aid in volatility management and create a more stable route for equitable growth and development. Diversification is even more critical now, given the slowing global economy and the need for Nigeria to boost the quantity and quality of employment.

5.3   Conclusion

COVID-19 shock significantly impacts on international trade and economic growth. COVID-19 explains 98.399% on the changes in economic growth while COVID-19 explains 8.395% on the changes in import while it explains 98.392% on the changes in export. This implies that there is a significant and negative impact of COVID-19 on economic growth and international trade. The COVID-19 pandemic has severely hit Nigeria. Evidently, there is noticeable change in the trade network structure in 2020Q1 compared to 2018. COVID-19 pandemic which originated from China spread across all countries of the world, China is the core of Nigeria's import. Chine alone covering about 60 percent of supply and demand in the world trade, consequently leading to a decline in the global trade significantly affecting Nigerian economy and so it could be concluded that COVID-19 affects the Nigeria's trade indirectly during the COVID-19. In collaborate with this is Maliszewska, Mattoo, and Van Der (2020), he revealed that the impact of COVID-19 on GDP has been predicted to be affected negatively, global trade will be cut by about 905 billion US Dollars. Global trade will be cut by 2,095 billion US Dollars under the long containment scenario. Growth in GDP will fall by 5.4 percent under the short run.

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