Crude-Oil Price and Covid-19 Pandemic Shocks on Unemployment and Economic Welfare: Experience from Nigeria, South Africa, and Kenya

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Abstract

This paper investigates crude-oil price oil and covid-19 pandemic shocks on unemployment and economic welfare in Nigeria, South Africa, and Kenya. Using the Structural Vector Autoregressive (SVAR) model, impulse response function, and vector decomposition to analyse daily data from January 3rd, 2020 to September 23rd, 2021. The economic welfare and unemployment shock are an upshot of the pandemic, lockdown, and oil price shock effect. The SVAR model estimation revealed that oil price shock mirrors a change in the price of oil due to an unanticipated change in the oil market. The results also indicate that an increase in oil prices affect economic welfare and unemployment positively before the pandemic and negatively due to the lockdown, restrictions on economic and social movement, increase in the number of death and confirm cases. The impulse function analysis also revealed a reverse effect of oil price and covid-19 shock on unemployment and economic welfare. The demand side effect revealed a mix of the effect of the pandemic and oil price shock on economic welfare and the unemployment rate. The Johansen cointegration test shows the existence of long-run nexus in the series. Indicating that an increase/decrease in oil prices and covid-19 death cases has a proportional influence on economic welfare and unemployment rate. The study recommends investment in non-oil sectors and annual stimulus budget allocation for future pandemics and unforeseen economic and health crises. To cushion and mitigate future vicissitude of oil shocks.

Keywords: Covid-19 Pandemic, Economic Welfare, Unemployment, Structural VAR

1. Introduction

Pandemics like civil and world wars have colossal economic and social costs challenging the very essence of survival. These upshots can be accredited to elements of transmission and overflow springing up from globalization. The novel Coronavirus Disease (Covid-19) like the 2002 Severe Acute Respiratory Syndrome Coronavirus Virus (SARS-CoV) discovered in Guangdong Province of Southern China and Wuhan in December 2019 threatens global stability (Udo, Abner, Inim & Akpan, 2020). The shock emanating from this pandemic is unprecedented on several fronts. In March 2020, World Health Organization (WHO) declared the novel (Covid-19) a pandemic due to its colossal impact on the $90 trillion global economy. The direct-indirect, supply-demand shocks of covid-19 led to; GDP decline, commodity, tourism, income, and social welfare slump, revenue shocks (oil prices and export commodities) among others. The widespread in about 200 countries with more than 227 million confirmed cases and about 4.7 million fatalities further demonstrate the economic impact of globalization. Hence, Africa accounted for more than 8 million cases and 200,000 death cases. Udo, Abner, Inim, and Akpan, (2020) argued that figures from African countries are uncertain. The stringent covid-19 safety protocols of lockdown and restriction of movements globally initiated to curtail the spread have not only instigated financial-business crisis but double-digit inflation, higher

unemployment rate, and income inequality rates. The low demand-excess supply of oil and the March 2020 oil disputes with Saudi Arabis also caused a dip in oil price from about US$72.18 per barrel in early January 2020 to US$11.03 per barrel in April 2020 (Curdia, 2020). The swipe in oil prices and the safety protocols resulted in panic buying, portfolio reversal, and withdrawal of funds from private and stocks to a more stable and safer investment such as bonds.

Oil revenues and prices shocks are significant non-macroeconomic oscillators thrusting growth development; especially in mono-cultured oil-exporting nations in the sub-Saharan Africa region. Crude oil is the major source of energy and foreign earnings for oil-exporting nations. The adoption of a mono-cultured economy and the relegation of agriculture after the 1970s oil boom is not without consequence. This is visible in the lack of economic shocks absorber from external forces such as oil prices and American dollars fluctuations (Olomola & Adejumo, 2006; Salisu & Mobolaji, 2013). According to Manasseh, Ihedimma, Abada, Nwakoby, Njoku, Kesuh, Okeke, Alio, and Onwumere (2020) the vicissitudes within the economic, climate can largely be ascribed to oil prices changes. Similarly, Mckillop (2004); Shambaugh, (2020); Carlsson-Szlezak, Reeves, and Swartz, (2020) argued that changes in oil prices initiate macroeconomic-stock market panic, price-inflation fluctuations, higher interest rates, and impending recession. Carlsson-Szlezak, Reeves, and Swartz, (2020) noted that the span of the recession anchor on the elasticity of the economy to absorb shocks triggered by exogenous and endogenous forces; like covid-19 and oil price shocks. According to Shambaugh, (2020) the 2020Q1 shock was exogenously calibrated. Oil price shocks in any economy are influenced by its operational activities either as an oil-exporting or oil-importing nation. The economy is responsive to changes in oil prices in exporting and reverse in oil-importing countries (Krugman 1983). The treks in oil prices are noticeable in the near-collapse of oil-importing economies during the pandemic. Manasseh, Ogbuabor, Abada, Okoro, Egele, and Onwumere (2017) argued that the magnitude of these treks comparatively anchors on labour market flexibility and capacity to transfer the cost implication to the consumers. The devastating supply-side uproar of oil price shocks caused is by covid-19 and the demand-side effect of Covid-19 measured in daily cumulative death cases (figure 1-2).

Fig.1: Average Crude Oil Price in U.S. Dollars Per Barrel on Economic Welfare, Inflation and unemployment rates.

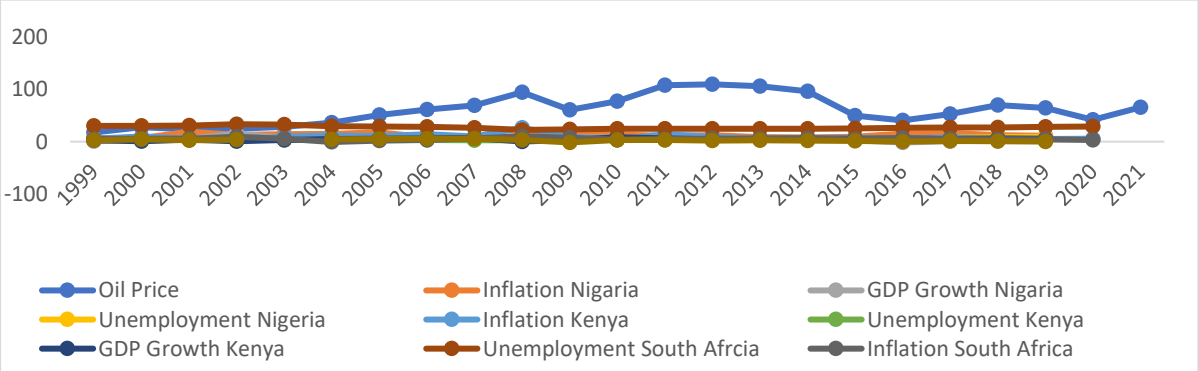
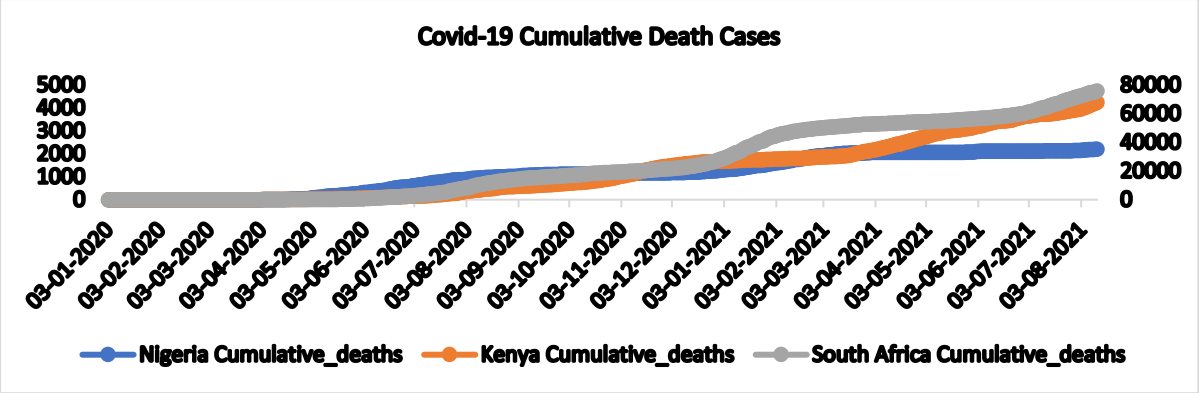


Figure 2 Covid-19 Cumulative Death Cases



The sustained oil price shock and the covid-19 cumulative death cases snowball to a negative GDP growth rate, a decline in economic activities, public revenue, and merchandise exports contraction (UNCTAD, 2020a; 2020b). As individuals voluntarily embrace the safety protocols. To curtail these desolating effects various monetary, fiscal, and palliative intervention programs and policies were implemented globally. Evidence revealed that these policy intervention programs especially; food supply, tax measures direct and indirect, loans, grants, a moratorium on debt repayment, customs measures among others in Nigeria, Kenya, and South Africa to a large extent nosedive in cushioning and achieving targeted objectives. Prior studies on oil price shocks, unemployment, and covid-19 reported diverse results. In Kenya Nafula, Kyalo, Munga, and Ngugi (2020) observed an increase in extreme poverty from 28.9% in 2019 to 41.9% in 2020 and 11.7% in household losses. In Nigeria Amaehule (2020) accredited the 2015-2017 recession to the global slump in global oil prices, a supply-side shock effect that is also responsible for 2020 economic fluxes.

Ehikioya, Omankhanlen, Babajide, Osuma, and Omodero (2020) in sub-Saharan Africa reported cointegrating nexus between oil price changes and the real exchange rate in sub-Saharan oil-dependent nations using the Johansen cointegration and the vector error correction model (VECM). In Saudi Arabia Al-Mogren (2020) reported that oil prices are not statistically significant predictors of Saudi stock market movements using the Vector Error Correction Model (VECM). In Nigeria Ozili (2020) and Ataide, Abomaye-Nimenibo, and Samuel (2021) observed that oil price fluxes and covid-19 spill over triggered economic slump using the Pearson Correlation and descriptive analysis. Most empirical studies in sub-Saharan Africa on this issue ignore the effect of the covid-19 pandemic on economic welfare and unemployment. Against this background, it is pertinent and justifiable to examine the impact of these shocks in Nigeria, South Africa, and Kenya. Oil price is critical to the economy given its web of influence on other macroeconomic variables such as exchange rates, economic growth, inflation rate, unemployment, and welfare among others.

2. Review of Related Literature

The impact nexus between oil price shocks and economic activity has been reviewed extensively in empirical literature with conflicting results. On the contrary scanty studies have examined oil shocks and covid-19 pandemic on macroeconomic variables of the exchange rate, unemployment, economic welfare amongst other variables in Nigeria, Kenya, and South Africa. The nexus between oil price shocks on macroeconomic variables vary in both oil-exporting and oil-importing countries. Oil price increase impacts positively on oil-exporting nations and negatively as oil price decline in oil-importing nations. Ahmad (2013), Beaudreau, (2005) Tang et al., (2009) assert that oil price shocks influence economic activities through various transmission mechanisms channels embracing the supply-demand side effects, unexpected effect, sectoral adjustment effect, inflation effect, and real balance effect. The

supply-side effect revealed that a unit increase in oil price shocks triggers marginal-production costs increase and diminishes production level, economic welfare, growth, and development. The demand side effect also revealed the adverse effect of the covid-19 pandemic and oil price shocks on investment and economic welfare, inequality gap, poverty, unemployment, high cost of living among others. The inflation effect proposed by Tang et al., (2009) revealed that oil price shocks trigger domestic inflation. The sectoral adjustment effect explains the impact of oil price shocks on the relative production cost of some industrial sectors and its inferences on labour force and unemployment (Beaudreau, 2005).

Brown and Yucel's (2002) unexpected effect, describes the uncertainty associated with the direction-impact of oil prices on the economy. In a cross-sectional study using daily data from 1 June 2019-16 March 2020 Qing, Liu, Wang, and Yu (2020) observed bi-directional spill-over effects of COVID-19 on the stock market among Asian countries of China, Japan, South Korea, and European countries of France, Germany, Italy and the United States of American, an adverse but short-term effect was observed on stock markets. Baker et al. (2020) collaborated on the findings of Qing, Liu, Wang, and Yu (2020) on the impact of COVID-19 on the stock market. Reporting that covid-19 safety protocols largely account for the unprecedented impact of the pandemic on the US stock market. In Nigeria Ozili (2020) noted that the global economic crisis is an upshot of the pandemic and oil price shocks. In Nigeria Osagie, Maijamaa, and John (2020) collaborated on the findings of Qing, Liu, Wang, and Yu (2020). Using EGARCH estimation technique and daily data from 2 January 2020 to 16 April 2020 to report the adverse and significant impact of covid-19 on stock market performance. Basher et al. (2012) opined that oil price shocks affect macroeconomic fundamentals of interest rates, unemployment rates, inflation, and GDP growth rates. Oil price shock mirrors a change in the price of oil due to an unanticipated change in oil market fundamentals (global supply-demand). According to Hamilton (2009a; 2009b), oil prices change is triggered by either geopolitical or economic, global health and social events, disrupting supply (supply-side shocks) or economic growth/downturns (demand-side shocks).

The supply-side shocks are stirred by events such as the Yom Kippur War in 1973, the Iranian revolution in 1978, Iraq's invasion of Iran and Kuwait in 1980 and 1990, the Arab Spring in 2010, Syrian unrest in 2011, the 2020 Saudi Arabia oil disputes and covid-19 safety protocols. Similarly, the demand-side shocks are related to oil price changes influenced by activities within the global business climate. Such as the 2004-2007 Chinese and other emerging economies growth that significantly increases oil demand. On the contrary, Kilian (2009) revealed three types of oil price shocks, consisting of; the supply-side, aggregate demand, and precautionary demand shocks. Kilian's aggregate demand shocks are the same as Hamilton's demand-side shocks. Kilian (2009), argued that geopolitical unrest, primarily observed in the Middle East region, does not translate to supply-side oil price shocks, as proposed by Hamilton (2009a; 2009b). These events trigger precautionary demand shocks, arising from uncertainty posed by geopolitical turbulence, public health emergency among others on economic agents, and the future availability of oil. Kilian opined those supply-side shocks are related to restrictions in oil supply by OPEC, via cartel behaviour, as a strategy to inflate oil prices. In recognising the contribution of prior literature on the economic implications of the novel COVID-19 on macroeconomic variables, it is vital to establish that focus on the stock market and economic performance are vast, attention accorded to other variables such as oil price, economic welfare, and unemployment rate are scanty. Contemporary studies on COVID-19

failed to analyse the implication of the COVID-19 pandemic and oil price shock in developing countries. This study contributes to the global knowledge bank by examining the COVID-19 pandemic and oil price shocks on economic welfare and unemployment rate in Nigeria, Kenya, and South Africa.

3. Appraisal of Oil Price, Unemployment duringCOVID-19 pandemic Era in Selected Countries

The COVID-19 pandemic has spread to over 155 countries, the transmission effect of Covid-19 is both endogenous and exogenous. The exogenous effects are of direct trade links between affected partner continents of Asia, Europe, and the United States; and the endogenous effect spurs from its rapid spread in Africa. The globally reported and confirmed cases of COVID-19 as of 21 September 2021, stood at 228,807,631including 4,697,099 fatalities and 5,776,127,976 vaccine doses administered. South-East Asia account for 42,594,207 confirmed cases, America 88,207,746, Europe 68,568,504, Western Pacific 7,995,114, Eastern Mediterranean 15,515,094 and 5,926,202 for Africa. South Africa accounted for 2,884,134 cumulative cases and fatalities 86,216, Kenya 246,643 cases and fatalities 4,995 and Nigeria 202,191 cases and fatalities 2,661 (see figure 2 above). The increasing number of confirmed cases explains the ripple effect on the economy.

3.1. Oil price during the COVID-19 period

In the wake of the pandemic, the average price of crude oil stood at US$68.54 pb. The safety protocols tremendously affected economic and social activities globally. Resulting in to decline in the demand for crude oil. Saudi Arabia's refusal to blue-penciled oil production triggered price shock and nosediving average crude oil price to US$14.81 pb in April 2020. In contrast to the 2009 and 2016 global economic recession, the oil price declined by 84.7% from US$72.18 pb on 7 January 2020 to the lowest value of US$11.03 pb on 1 April 2020. Oil price dip translated to a dip in foreign earnings, foreign reserves, currency depreciation, and balance of payment for oil-dependent countries. The easing of the lockdown and gradual re-opening of economic activities led to an upward trend in the oil demand and price of crude oil to US$33.91 pb on 29 May 2020. A positive change in oil prices is projected given the gradual and continuous opening of economic activities globally.

3.2. Unemployment Rate During COVID-19 Pandemic

The hash impact of covid-19 and its safety protocols is evident in the sustained increase in informal sector job loss employing more than 50% of the labour force in Africa and contributing about 55% to Sub-Saharan African gross domestic product (African Development Bank, 2019). Ruzvidzo (2020) revealed that approximately 250 million Africans in informal urban employment are expected to be at risk of a job loss. The African Union report (2020), shows that about 20 million jobs in the formal and informal sectors are threatened. The International Labour Organisation (ILO) forecast about a 25 million unemployment rate increase (African Union, 2020). In Nigeria out of 1,950 households surveyed, about 42% lost their jobs, in South Africa about 35.2% and Kenya 30.1%, 79% of the surveyed household also reported income loss. The service, commerce, and agricultural sectors among others collectively accounted for the highest workers layoffs in studied countries. Similarly, the start-up sector comprising of Micro, Small, and Medium Enterprises (MSMEs) employing about 80% of the labour force in Africa according to Iloani et al., (2020) layoff about 50,000 workers while about 15,000 start-up MSMEs have collapsed. The African economy has long suffered

from sustained high unemployment contributing to poverty and inequality over decades. The pandemic has only exacerbated the numerous woes of the Nigerian, Kenyan, and South African labour market. In mitigating the pandemic woes on the economy, various intervention policies and programs such as the US$138.5 million (₦50 billion) intervention fund in Nigeria, 100% tax relief for workers with a gross monthly income of up to 24,000 Kenya Shillings, 3 billion Kenya shilling start-up capital for SMEs in Kenya and South Africa R500,000,000 debt relief fund among others were implemented.

4. Data Source and Model

Grounded on theoretical underpinning which asserts that oil price shocks influence economic activities via the supply-demand side effects, unexpected effect, sectoral adjustment effect, inflation effect, and real balance effect (Ahmad 2013, Beaudreau, 2005, Tang et al., 2009). The Structural VAR (SVAR) model was employed to analyse the natural response of the unemployment rate and economic welfare to the Covid-19 pandemic and oil price shocks in Nigeria, South Africa, and Kenya. Using daily covid-19 and oil prices data among other variables of interest from various relevant sources from January 3rd, 2020 to September 23rd, 2021. The SVAR model is keen on the influence of the endogenous variable innovations on other endogenous variables capture in this study. Brent Crude Oil Price proxy oil prices (OIP); Final Consumption Expenditure (FCE) and Real GDP (RGDP); (proxy economic welfare of households and enterprises whose focal economic center of interest is the scope of this study); Unemployment Rate (UNE); Exchange rate (EXC); Inflation rate (INF) and COVID-19 confirmed deaths (COV). Covid-19 death cases were sourced from World Health Organization. Brent oil prices are sourced from International Energy Agency and Final Consumption Expenditure (FCE) and Real GDP (RGDP) sourced from World Bank Development Index.

4.1 The SVAR Model

The SVAR examines the transmission of the shock from oil prices and Covid-19 to economic welfare and unemployment. A set of contemporaneous restrictions on the variables linking economic theory are imposed by this model to separate innovations to the variables orthogonally to have structural interpretation. Once the shocks are identified, the effects on all the variables in the model can be dynamically measured. The general algebraic SVAR representation is expressed as:

$$AY_t = C + \sum_i^N D_i Y_{t-1} + BV_t \qquad \text{eq.1}$$

The uppercase alphabet $Y_t = \{C0V \text{ and } OPI\}$ vector of variables. Economic welfare is measured by real GDP and real income is proxy by wage and salary of workers, total (% of total employment) (modeled ILO). Economic welfare and unemployment rate are denoted as vector matrix. Matrix *A* is the contemporaneous matrix that shows the linear nexus between the endogenous variables; matrix *C* contains the constant parameters; matrix *D* is the lag matrix controlling the underlying dynamics embedded in the model; matrix *B* is the diagonal weight matrix for the serially and mutually uncorrelated structural shocks *vt*. The SVAR model in this study imposes a block-recursive structure on the contemporaneous nexus between the reduced-form shocks and the underlying structural shocks. The first block constitutes a model of Nigerian, South African, and Kenyan COVID-19 death. The second block constitutes a model of the global crude oil price shock in Kilian's (2009) recursive identified structural model was adopted to express and examine (see equation 2) the underlying oil price and COVID-19 shocks effects on economic welfare and unemployment. Using the $cholesky$ triangular factorization the SVAR model used 5 variables which are imposed on the long-run C (1) matrix;

$$C(1) = \begin{vmatrix} Variables \\ z_t \text{OIP} \\ z_t \text{ FCE} \\ z_t \text{ RGDP} \\ z_t \text{ UNE} \\ z_t \text{ COV} \end{vmatrix} = \begin{vmatrix} z_t\,OIP & z_t\,FCE & z_t\,RGDP & z_t\,UNE & z_t\,COV \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{vmatrix} =$$

$$\begin{vmatrix} V_t \text{ shock to RGDP} \\ V_t \text{ shock to FCE} \\ V_t \text{ shock to UNE} \\ V_t \text{ OIP shock} \\ V_t \text{ COV shock} \end{vmatrix} = \begin{vmatrix} z_t\,OIP & z_t\,FCE & z_t\,RGDP & z_t\,UNE & z_t\,COV \\ a11 & 0 & 0 & a14 & a15 \\ 0 & a22 & 0 & a24 & a25 \\ 0 & 0 & a33 & a34 & a35 \\ 0 & 0 & 0 & a44 & a45 \\ 0 & 0 & 0 & a54 & a55 \end{vmatrix} =$$

$$\begin{vmatrix} z_t\,OIP & z_t\,FCE & z_t\,RGDP & z_t\,UNE & z_t\,COV \\ 1 & 0 & 0 & 0 & 0 \\ NA & 1 & 0 & 0 & 0 \\ NA & NA & 1 & 0 & 0 \\ NA & NA & NA & 1 & 0 \\ NA & NA & NA & NA & 1 \end{vmatrix} \quad \text{eq2}$$

The non-zero coefficients a_t and NA, in the matrices indicated that any residual a_t in matrices z_t and V_t has an instantaneous effect on variables. The above structural identification matrix is divided into two segments of COVID-19 and oil price shock. The justification for the recursive identification matrix in equation 2 is as follows: The structural implication of the first five lines in the structural identification matrix is that the COVID-19 responds to shocks of its own that are likely to be caused by an increase in death and confirm cases resulting to economic and social lockdown and restriction of movement, as well as to other shocks arising from unemployment, exchange rate, and inflation rate. Also, the oil price is affected by some shocks which are neither oil-supply shocks nor aggregate demand shocks. In the aggregate demand block, real economic activities respond instantaneously to oil-supply shocks but may be affected by other shocks with lags. Hamilton (1983) and Kilian (2009) opined those global economic activities could be influenced by oil price shocks. However, oil supply shock is exogenously determined and not contemporaneously influenced by other shocks in the model. Kilian (2009), noted that crude oil demand-supply shocks in any economy vary and is determined by whether the increase in oil price is driven by a shortfall in oil production or oil spillage, or maybe a shift in precautionary demand for crude oil due to market uncertainty, global healthy emergency among others. These shocks have diverse effects on economic

welfare and unemployment since oil price shock is being accompanied by another related shock such as the oil demand and supply shocks.

5. Results Presentation and Analysis

To ensure model stability, the stationarity properties of individual series in the model were examined using the Augmented Dickey and Fuller (ADF) (1979) and Phillips and Perron (PP) (1988) framework. The optimal lag length in the ADF test is grounded on the Akaike information criterion. The model consists of variables in mix relative (rate, percentage) and absolute values, the semi-log (linear-log) functional form of the model is specified in the equations above.

5.1 Descriptive statistics

The descriptive statistics were performed to examine the time-varying shocks and leptokurtosis characteristics of the variables. Table 1, revealed that the sample mean is not zero and the standard deviation is high for COV and economic welfare (RGDP and FCE) indicating that these series are prone to shocks. The value of the mean and median of the variables are not too far from each other indicating no extreme projection. The skewness statistic shows that all the series are positively skewed except for OIP and EXC in Kenya, COV, OIP, UNE, and RGDP in Nigeria, and OIP, RGDP, and UNE for South Africa that is negatively skewed. This implies that the series is not symmetric having an extreme tail to the right, OIP and EXC in Kenya, COV, OIP, UNE and RGDP in Nigeria, and OIP, RGDP and UNE for South Africa has an extreme tail to the left. The kurtosis statistic shows a blend of platykurtic, leptokurtic, and mesokurtic variables. The Jarque–Bera statistic which combines both skewness and kurtosis statistics shows that the normality assumption for the series cannot be rejected.

Table 1: Descriptive Statistics of Variables

Countries	Variables	Mean	Median	Std.Dev	Skewness	Kurtosis	Jarque-Bera	Prob
Kenya	COV	1459.77	1191.50	1392.62	0.571	1.95	62.93	0.0000
	OIP	52.833	53.85	16.272	-0.371	2.27	28.43	0.0000
	RGDP	332.31	309.37	216.62	9.32	88.01	19882.6	0.0000
	UNE	7.379	7.200	1.419	0.88	3.75	96.46	0.0000
	FCE	108.78	100.54	44.802	12.90	199.50	10311.1	0.0000
	INF	6.347	5.40	1.145	0.73	1.99	84.01	0.0000
	EXC	107.50	108.10	2.630	-1.35	4.22	232.54	0.0000
South Africa	COV	28724.8	20043.5	26269.9	0.37	1.63	63.74	0.0000
	OIP	52.83	53.85	16.27	-0.37	2.27	28.43	0.0000
	RGDP	7267.77	7345.9	738.17	-9.32	88.01	19882.6	0.0000
	UNE	17.84	20.01	4.70	-1.75	4.11	354.31	0.0000
	FCE	94.77	86.53	44.80	12.90	199.5	10311.7	0.0000
	INF	4.99	4.22	1.81	0.49	1.752	66.23	0.0000
	EXC	15.67	15.15	1.39	0.67	2.37	57.80	0.0000
Nigeria	COV	1174.40	1162.00	807.63	-0.18	1.60	54.57	0.0000
	OIP	54.57	53.85	16.27	-0.37	2.27	2.27	0.0000
	RGDP	70359.7	70288.5	329.41	-0.22	3.98	31.15	0.0000
	UNE	31.51	33.28	4.65	-0.60	1.96	66.66	0.0000
	FCE	92.61	84.37	44.80	12.90	199.50	10311.7	0.0000
	INF	11.97	11.39	0.79	0.88	2.15	101.51	0.0000
	EXC	388.50	387.20	19.13	-6.36	104.18	27303.2	0.0000

Source: Authors' computation (2021)

5.2. Unit Root Test

From the results of the augmented Dickey-Fuller test (ADF) and Phillips-Perron Test methods presented in Table 3, it can be deduced that the variables are stationary at a level I (0) and the

first difference I (1). The p-values of the variables are all less < 0.05, which causes the null hypothesis of the presence of unit root to be convincingly rejected.

Table 3 Unit Root Test Results

		Augmented Dickey-Fuller Test			Phillips-Perron Test		
Countries	**Variables**	**T-stat**	**5% Critical Value**	**Order of Integration**	**T-stat**	**5% Critical Value**	**Order of Integration**
Kenya	COV	-24.75	-3.41	I (1)	-24.75	-3.41	I (1)
	OIP	-26.15	-3.41	I (1)	-26.28	-3.41	I (1)
	RGDP	-66.33	3.94	I (1)	-66.38	-3.41	I (0)
	UNE	-25.02	-3.41	I (1)	-25.02	-3.41	I (1)
	FCE	-18.90	-3.41	I (0)	-19.27	3.41	I (0)
	INF	-4.22	-3.41	I (0)	-18.24	3.41	I (0)
	EXC	-21.39	-3.41	I (1)	-21.39	-3.41	I (1)
South Africa	COV	-6.83	-3.41	I (0)	-27.60	3.41	I (1)
	OIP	-26.15	-3.41	I (1)	-26.28	-3.41	I (1)
	RGDP	-66.38	- 3.41	I (1)	-66.38	-3.41	I (0)
	UNE	-6.60	-3.41	I (1)	-7.42	-3.41	I (1)
	FCE	-16.07	-3.41	I (1)	-19.27	-3.41	I (0)
	INF	-9.06	-3.41	I (1)	-23.29	-3.41	I (0)
	EXC	-25.03	-3.41	I (1)	-25.04	-3.41	I (1)
Nigeria	COV	-4.65	-3.41	I (1)	-24.58	-3.41	I (1)
	OIP	-26.15	-3.41	I (1)	-26.28	-3.41	I (1)
	RGDP	-25.03	-3.41	I (1)	-25.03	-3.41	I (1)
	UNE	-25.21	-3.41	I (1)	-25.22	-3.41	I (1)
	FCE	-18.90	-3.41	I (0)	-19.27	-3.41	I (0)
	INF	-20.38	-3.41	I (1)	-29.08	-3.41	I (0)
	EXC	-6.41	-3.41	I (0)	-24.91	-3.41	I (0)

Source: Author's Computation (2021)

5.3. Cointegration Test

The cointegrating vectors are presented and discussed in Table 5, under the assumption that the series has a linear deterministic trend. The critical values were derived assuming no exogenous series. The Eigenvalue statistics indicate (4) cointegrating equations for Kenya, South Africa, and Nigeria (4) at a 95% confidence level. Signifying the rejection of the hypothesis at a 5% critical value. The presence of co-integration indicates shocks and diverges in the short run that may influence the individual series speed of converges with time in the long run. On the premise of the presence of cointegration, VECM was conducted.

Table 5: Cointegration Test Results

Hypothesized Coefficients	Eigenvalue	Trace Statistic	Critical Value (5%)	Prob.**
Kenya				
None *	0.538277	901.3914	125.6154	0.0001
At most 1 *	0.336635	418.3977	95.75366	0.0001
At most 2 *	0.150783	161.8791	69.81889	0.0000
At most 3 *	0.056141	59.72894	47.85613	0.0026
Nigeria				
None *	0.155503	231.3066	125.6154	0.0000
At most 1 *	0.077334	125.6726	95.75366	0.0001
At most 2 *	0.049168	75.36756	69.81889	0.0168

At most 6 *	0.007006	4.394144	3.841466	0.0361
South Africa				
None *	0.335480	453.3517	125.6154	0.0001
At most 1 *	0.140637	197.9204	95.75366	0.0000
At most 2 *	0.076878	103.1934	69.81889	0.0000
At most 3 *	0.038586	53.19738	47.85613	0.0145

*Indicate cointegrating eqn(s) at the 0.05 level

5.4. Vector Error Correction Model Estimation

The VECM measures the speed of converging from short-run disequilibrium instigated by unexpected shocks of the Covid-19 pandemic resulting in a decrease in oil demand, economic and social lockdown. It is measured as the effects of residual from the long-run model. The short-run imbalance and dynamic structure are expressed as VECM.

Table 6: Vector Error Correction Model Estimation

Kenya							
Variable	D(COV)	D(OIP)	D(FCE)	D(LOGRGDP)	D(UNE)	D(INF)	D(EXC)
CointEq1	-0.129200	-0.01550	-0.039800	-7.970007	2.220005	0.000131	1.190005
	[-1.61178]	[-3.55639]	[-3.09258]	[-0.36369]	[3.17163]	[5.75563]	[1.94452]
CointEq2	0.138403	0.017354	0.279364	7.800005	-0.002353	-0.012805	-0.001449
	[1.60177]	[3.69253]	[2.01337]	[0.33023]	[-3.12368]	[-5.22072]	[-2.19762]
CointEq3	-0.014287	0.000481	-0.725235	-1.500005	0.000496	0.000666	-0.000547
	[-0.39695]	[0.24591]	[-12.5482]	[-0.15280]	[1.58258]	[0.65163]	[-1.99203]
CointEq4	-2.251966	0.048508	-2.852736	-0.201888	0.001724	-0.455017	0.003660
	[-0.37598]	[0.14890]	[-0.29660]	[-12.3272]	[0.03303]	[-2.67636]	[0.08006]
R-squared	0.011765	0.070157	0.379933	0.204955	0.101284	0.700953	0.068426
F-statistic	0.402139	2.548563	20.69665	8.707601	3.806691	79.17375	2.481034
Log likelihood	-2944.889	-1119.336	-3241.867	755.5815	28.70764	-711.5827	111.9786
Akaike AIC	**9.454193**	**3.631057**	**10.40149**	**-2.349542**	**-0.030965**	**2.330407**	**-0.296582**
Schwarz SC	9.588767	3.765631	10.53606	-2.214968	0.103609	2.464982	-0.162008
South Africa							
	D(COV)	D(OIP)	D(FCE)	D(LOGRGDP)	D(UNE)	D(INF)	D(EXC)
CointEq1	-0.130200	-5.610006	3.060005	1.690008	1.220008	-1.310005	4.410007
	[-3.27500]	[-3.33690]	[0.62274]	[0.12936]	[0.14524]	[-8.41298]	[2.80750]
CointEq2	0.279958	0.002878	-0.305869	-3.280005	-0.000320	-0.022906	-0.000203
	[0.54492]	[1.32399]	[-4.82062]	[-0.19382]	[-2.95663]	[-11.3722]	[-0.99688]
CointEq3	-0.322806	0.000708	-0.703404	4.38006	-3.750005	-0.002108	-6.730005
	[-0.70417]	[0.36521]	[-12.4240]	[0.02901]	[-0.38811]	[-1.17281]	[-0.37107]
CointEq4	10.17710	-0.104224	-0.820760	-0.199533	0.008674	0.276287	0.017779
	[0.20210]	[-0.48925]	[-0.13197]	[-12.0404]	[0.81773]	[1.39949]	[0.89240]
R-squared	0.045989	0.059327	0.386691	0.202696	0.736704	0.412788	0.063136
F-statistic	1.628285	2.130322	21.29691	8.587234	94.51036	23.74455	2.276326
Log likelihood	-4549.798	-1122.967	-3238.432	478.2104	757.9567	-1075.253	362.7475
Akaike AIC	**14.57352**	**3.642637**	**10.39053**	**-1.464786**	**-2.357119**	**3.490442**	**-1.096483**
Schwarz SC	14.70809	3.777211	10.52511	-1.330212	-2.222544	3.625016	-0.961909
Nigeria							
	D(COV)	D(OIP)	D(FCE)	D(LOGRGDP)	D(UNE)	D(INF)	D(EXC)
CointEq1	-0.403300	-0.8900	0.08201	-1.350007	0.00120	0.000885	0.006575
	[-3.85203]	[-2.67385]	[0.84152]	[-1.15523]	[2.11555]	[8.98631]	[2.10328]
CointEq2	0.039001	0.006262	-0.218668	1.570006	-0.000796	-0.010994	-0.068341
	[4.48345]	[2.26410]	[-2.70078]	[1.62348]	[-1.68412]	[-13.4436]	[-2.63135]
CointEq3	0.012278	0.000746	-0.724079	-1.540007	-8.380005	-0.000623	0.011269
	[1.97565]	[0.37743]	[-12.5175]	[-0.22221]	[-0.24814]	[-1.06642]	[0.60731]

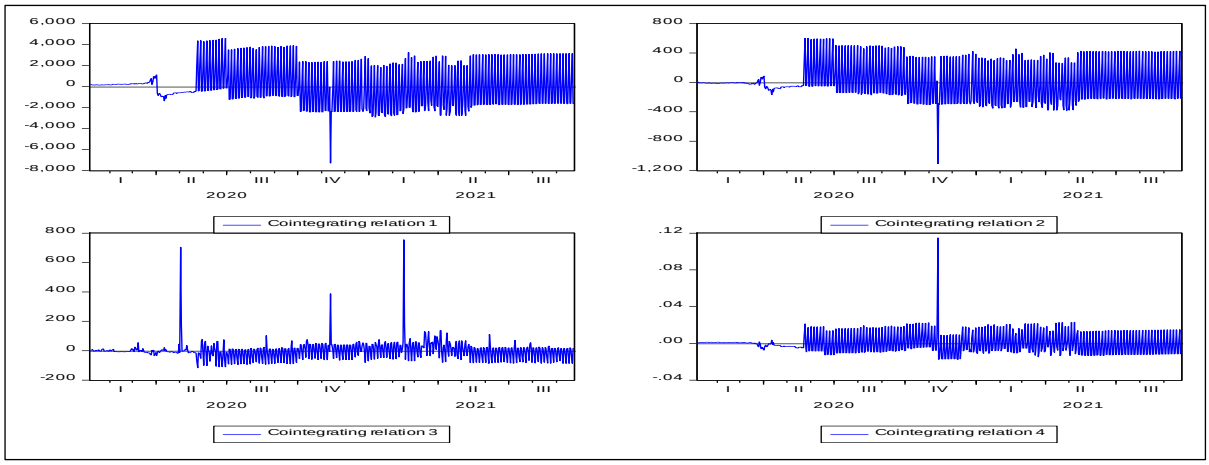
CointEq4	11.36423	-18.78025	1249.588	-0.032726	-2.548691	-96.06198	788.6649
	[0.25030]	[-1.30096]	[2.95694]	[-6.47554]	[-1.03330]	[-22.5057]	[5.81785]
R-squared	0.328381	0.064749	0.386850	0.335471	0.027742	0.843514	0.420155
F-statistic	16.51528	2.338493	21.31114	17.05190	0.963788	182.0733	24.47536
Log likelihood	-1839.620	-1121.154	-3238.351	3868.095	-13.31992	-357.1669	-2525.450
Akaike AIC	**5.928614**	**3.636856**	**10.39027**	**-12.27781**	**0.103094**	**1.199894**	**8.116267**
Schwarz SC	6.063188	3.771430	10.52485	-12.14324	0.237668	1.334469	8.250841

Source: Author's Estimation (2021)

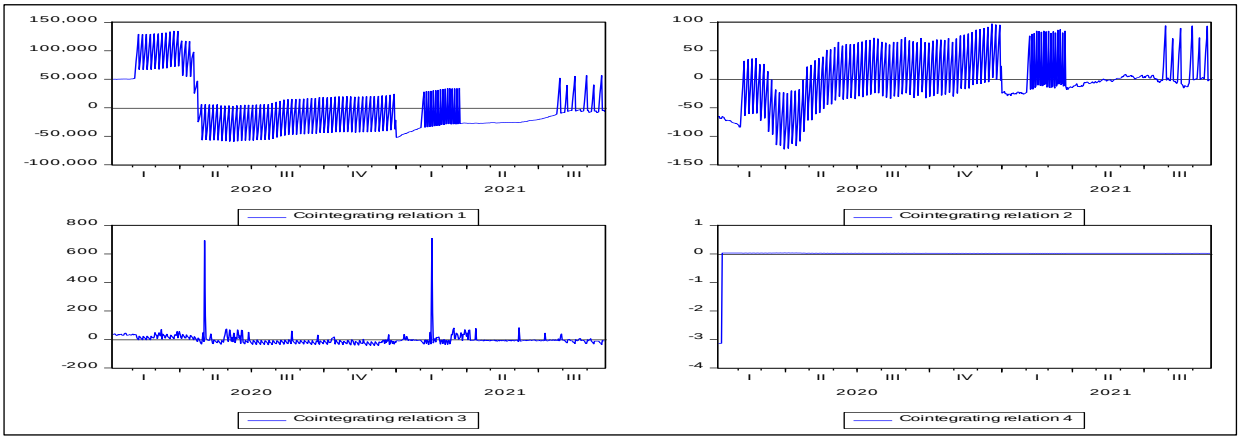
The data in Table 6 shows the fitting degree of VECM model $R^2 > 0.5$, and AIC and SC criteria values are relatively small, which indicates the reasonability of the model estimation. The zero average line represents a stable and long-term equilibrium relationship among variables. Figure 2 revealed significant and sustained fluctuational shocks in Nigeria, South Africa, and Kenya. The fluctuational shocks show that the short-term fluctuation within the period significantly deviated from the long-term equilibrium relationship. The short-term fluctuation effect shows a sharp drop in oil prices caused by the Covid-19 pandemic, lockdown, and safety protocols of the government (see fig. 2).

Fig. 2: Cointegration Relationship Graph.

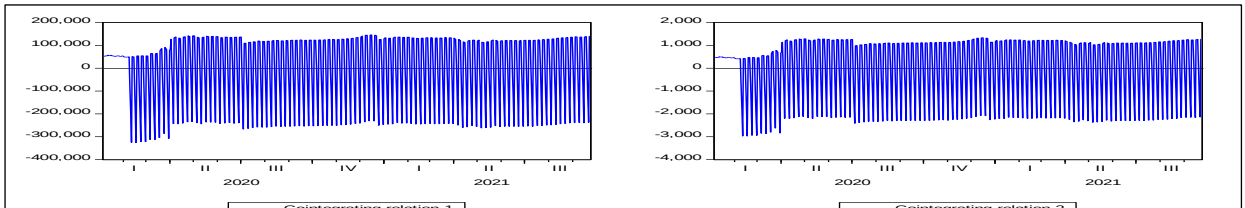
Nigeria



South Africa



Kenya



Oil price shock mirrors changes in oil prices accredited to an unanticipated change in oil market fundamentals (supply-demand). According to Hamilton (2009a; 2009b), changes in oil prices are triggered by several factors such as geopolitical or economic factors, global health, and social events, disrupting supply (supply-side shocks), or economic growth/downturns (demand-side shocks). The supply-side shocks are stirred by events such as the Yom Kippur War in 1973, the Iranian revolution in 1978, Iraq's invasion of Iran and Kuwait in 1980 and 1990, the Arab Spring in 2010, Syrian unrest in 2011, the 2020 Saudi Arabia oil disputes and covid-19 safety protocols. These events trigger precautionary demand shocks, arising from uncertainty posed by geopolitical turbulence, public health emergency among others on economic agents, and the future availability of oil.

Table 7: Impulse Response Table for Covid-19 Pandemic Shocks on Economic Welfare and Unemployment

Kenya				
Response of COV:				
Period	Shock1	Shock2	Shock3	Shock4
1	26.72778	0.000000	0.000000	0.000000
2	26.97479	0.013828	-0.270379	0.048324
3	27.04133	-0.080029	-0.550096	-0.044722
4	27.03384	-0.186870	-0.548706	-0.104774
5	27.01296	-0.309148	-0.476307	-0.097495
South Africa				
Response of COV:				
Period	Shock1	Shock2	Shock3	Shock4
1	348.6170	0.000000	0.000000	0.000000
2	327.4370	0.235610	-6.894317	1.680679
3	328.1763	3.177275	-11.29992	4.609442
4	326.9487	5.169721	-12.50197	7.844046
5	325.9091	6.909621	-13.39156	11.24562
Nigeria				
Response of COV:				
Period	Shock1	Shock2	Shock3	Shock4
1	4.906621	0.000000	0.000000	0.000000
2	6.690737	-0.127018	0.255570	-0.085326
3	7.442813	-0.333249	0.658086	0.033033
4	7.807894	-0.532917	0.896475	0.216809
5	7.944842	-0.678342	1.036218	0.406193

Source: Author (2021)

The impulse response reported in Table 7 above shows the response variations of other variables to Covid-19 and Covid-19 to itself for a specified period after a one standard deviation shock. Abimelech et al., (2017) opined that instantaneous error terms correlation may occur distinctly. Thus, permitting the use of the Cholesky decomposition procedure for variance-covariance matrix factorization under the vector autoregressive framework. Covid-19 response to itself was positive throughout the first shock period in Nigeria, Kenya, and South Africa. Similarly, South Africa maintained a positive shock throughout the second and fourth shock periods respectively. Nigeria maintained a positive shock throughout the third shock period and the third period of the fourth shock. However, Kenya maintained a sustained negative shock throughout the third shock period and the third period of the fourth shock. On the other hand, Nigeria maintained a sustained negative shock throughout the second shock period and in the second period of the fourth shock. The positive shock responses can be accredited to the early period of the Covid-19 pandemic outbreak globally without any ripple effect on the African economy. The negative period shows, the period of economic and financial lockdown and restriction of goods and services. Resulting in to increase in the unemployment rate via mass job loss and crowding out of start-up firms. After the first confirmed cases and death of Covid-19 was reported in Nigeria, Kenya, South Africa.

Table 8: Impulse Response Table of Oil Price Shocks on Economic Welfare and Unemployment

Kenya				
Response of OIP:				
Period	Shock1	Shock2	Shock3	Shock4
1	1.473827	0.000000	0.000000	0.000000
2	1.367156	-0.007045	-0.046036	0.173168
3	1.352526	0.019524	-0.045907	0.185402
4	1.339531	0.038661	-0.042491	0.206340
5	1.324656	0.055695	-0.042748	0.224556
South Africa				
Response of OIP:				
Period	Shock1	Shock2	Shock3	Shock4
1	1.475610	0.000000	0.000000	0.000000
2	1.352778	0.007964	-0.044706	0.031435
3	1.310181	-0.025854	-0.044075	0.059516
4	1.265872	-0.050443	-0.047502	0.082221
5	1.225362	-0.069030	-0.050717	0.102117
Nigeria				
Response of OIP:				
Period	Shock1	Shock2	Shock3	Shock4
1	1.479217	0.000000	0.000000	0.000000
2	1.376510	-0.025474	-0.048516	0.124332
3	1.365096	-0.032726	-0.037992	0.130553
4	1.351242	-0.043282	-0.034504	0.147720
5	1.334163	-0.050091	-0.031372	0.165709

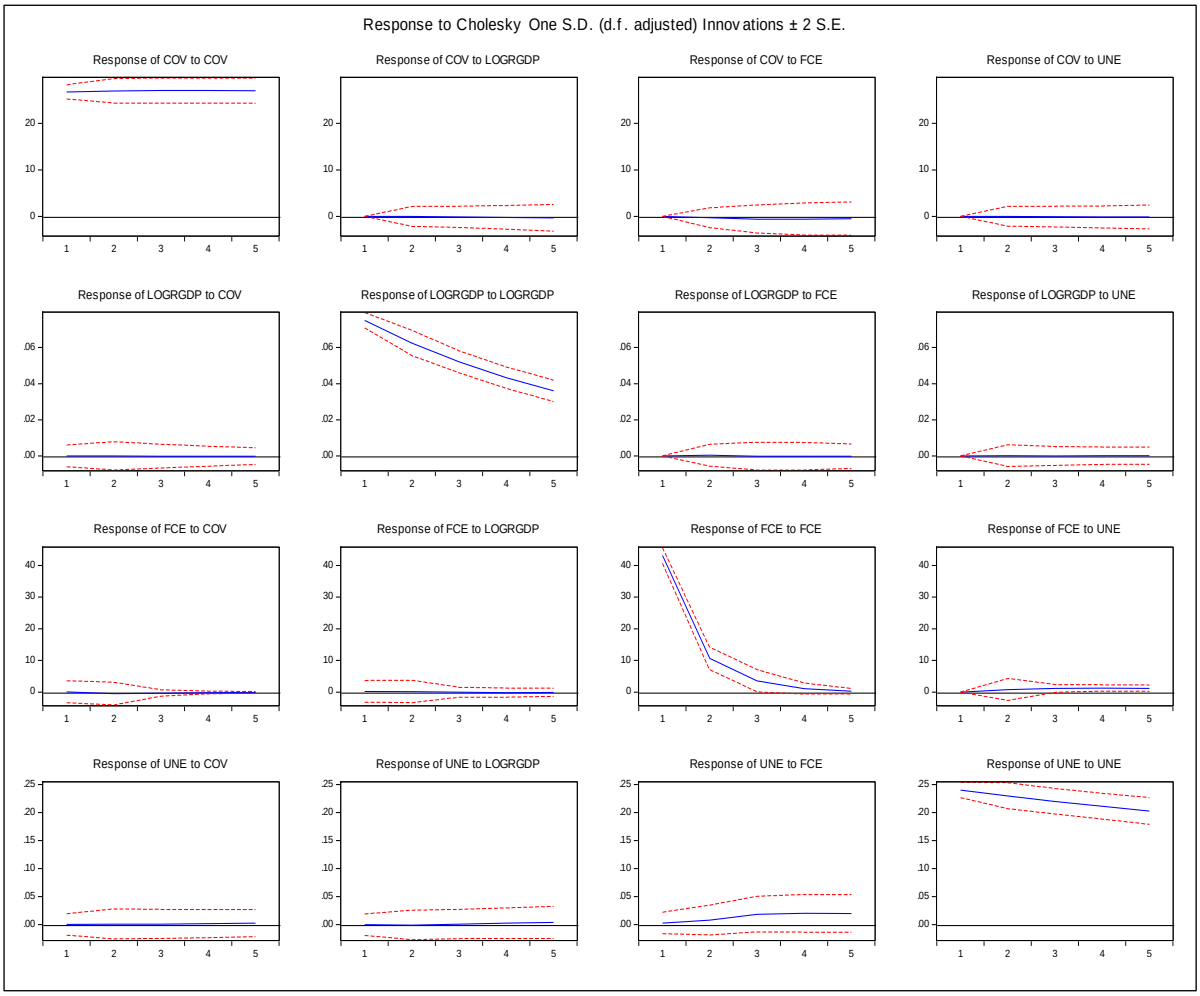
Source: Author (2021)

The impulse response reported in Table 8 above shows the response variations of other variables to oil price and oil price to itself for a specified period after a one standard deviation shock. Oil price response to itself was positive throughout the first shock period in Nigeria, Kenya, and South Africa. Similarly, Nigeria, South Africa, and Kenya maintained a sustained positive period throughout the fourth shock period in Nigeria, the second and fourth periods in

Kenya, and the fourth shock period in South Africa. On the other hand, Nigeria and South Africa maintained a sustained negative shock throughout the second shock period and third shock period while Kenya maintained a sustained negative shock in the third shock period. The positive shock responses can be accredited to the early period of the Covid-19 pandemic outbreak globally without any ripple effect on the African economy, especially on oil demand and supply. The negative period shows, the period of economic and financial lockdown and restriction of goods and services. Resulting in to decrease in oil demand and a drop in oil revenue. The negative and sustained shocks can be accredited to heavy reliance on imported refined petroleum products. An increase or decrease in oil price caused by oil demand shocks means an increase in production costs for firms and industries. The temporary tends to zero, became permanently positive in the long run due to ease of lockdown and the good news of possible vaccine. All these effects were significant at a 5% level of significance.

Figure 3: Impulse Response Graph of Covid-19 Pandemic Shocks on Economic Welfare and Unemployment

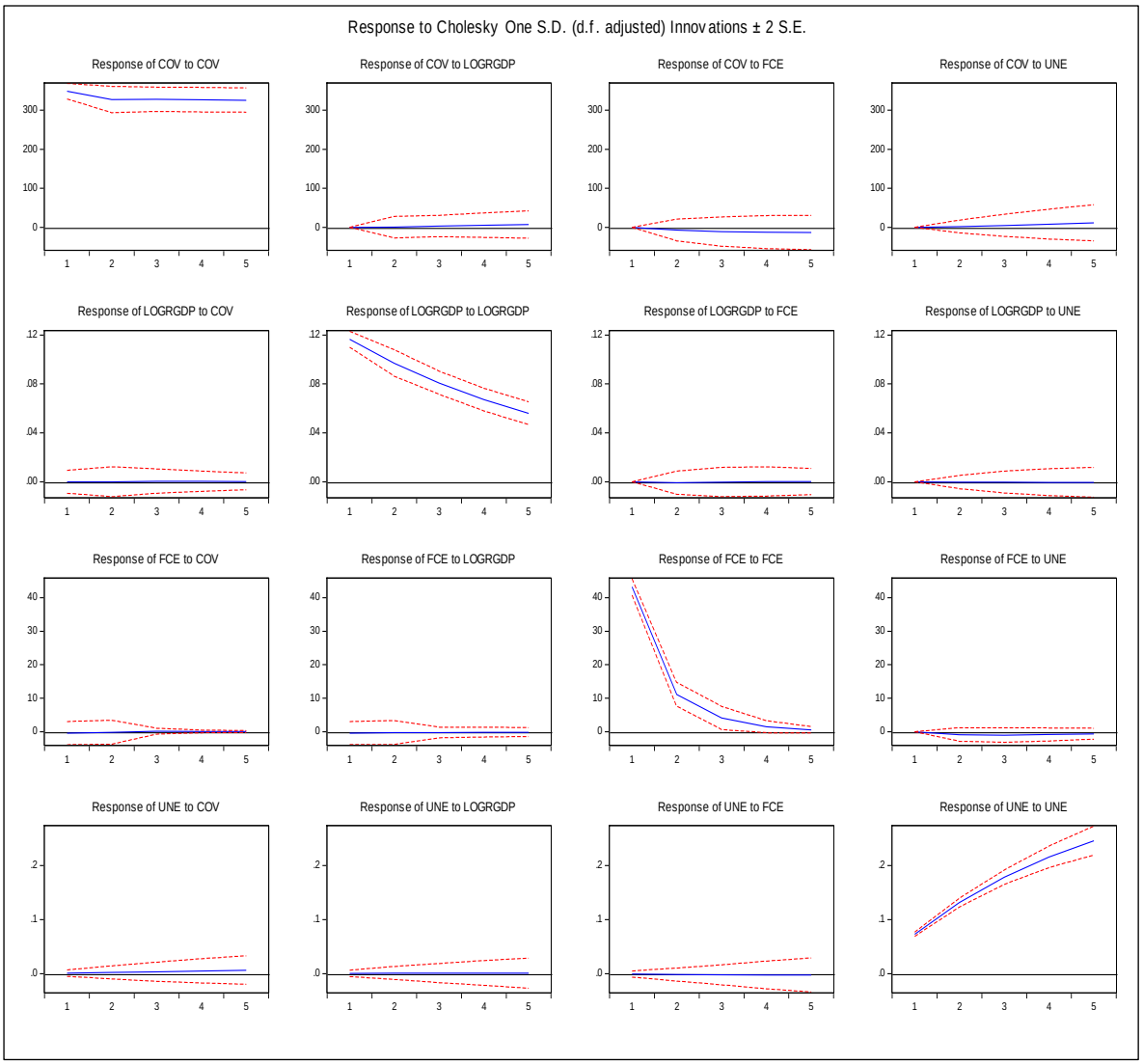
Kenya



Figures 3 above show that economic welfare and unemployment in Nigeria, South Africa, and Kenya responded diversely to a covid-19 pandemic, safety protocols, and lockdown of social and economic activities. The positive responses of economic welfare and unemployment show

the impact of government intervention through palliatives to cushion the harsh effect of Covid-19due to mass layoff of the labour force by firms to maintain manageable expenditure.

South Africa



Nigeria

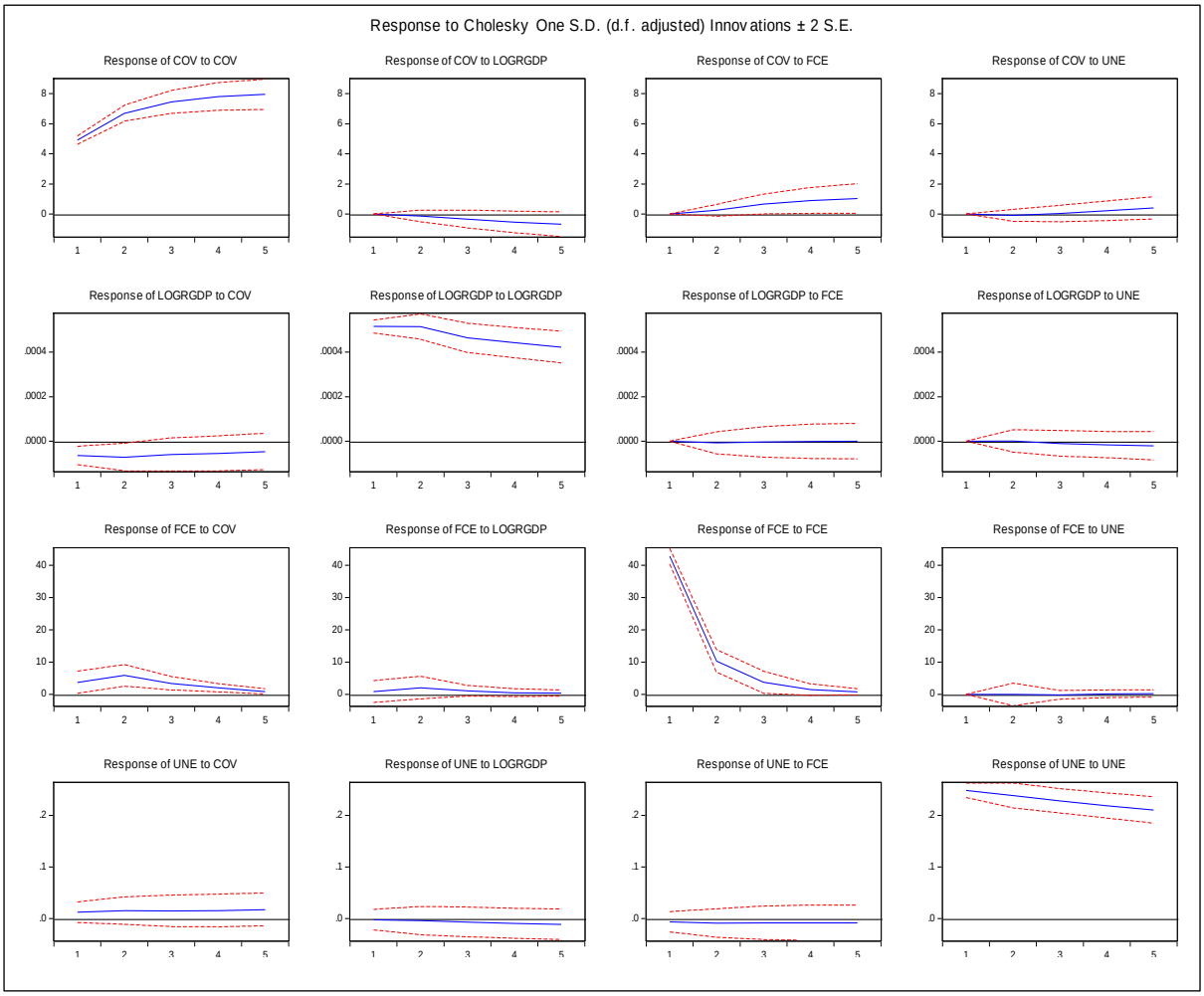


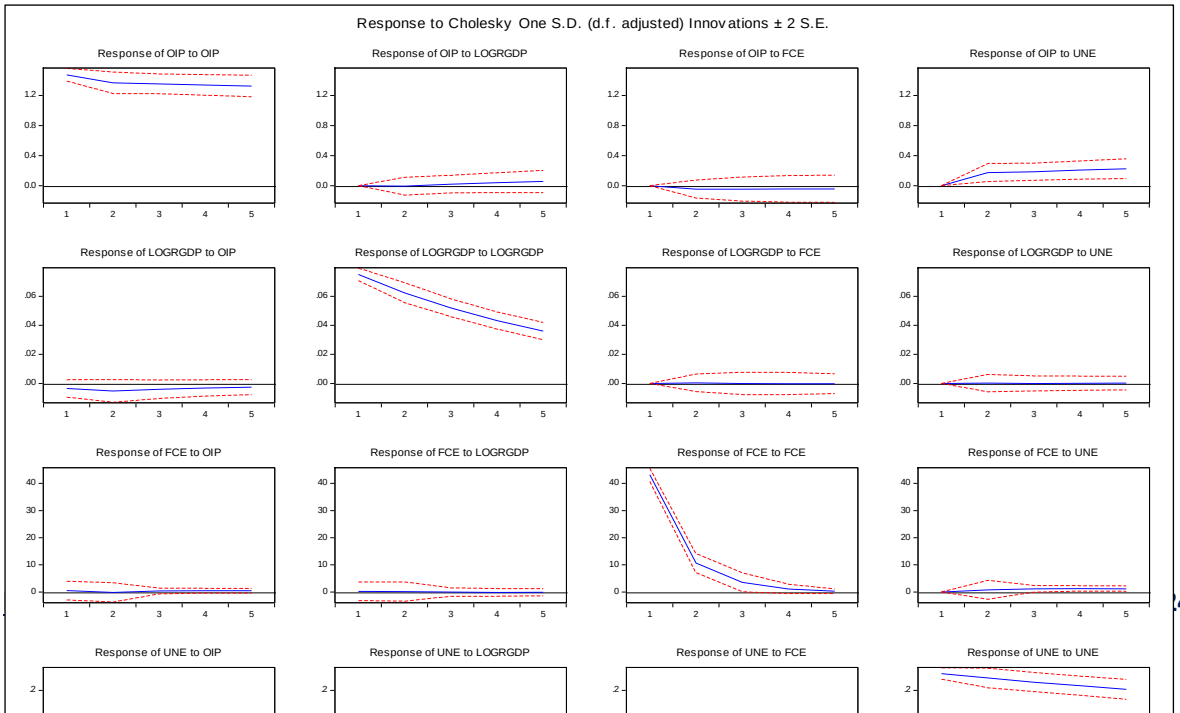
Figure 4: Impulse Response Graph of Oil Shocks on Economic Welfare and Unemployment

The impulse response graph reported in Figure 4 above shows that each of the variables responds differently to another variable or itself for a specified period after a one standard deviation shock has occurred. OIP's response to itself throughout the period was positive. The positively sustained shocks can be attituded to internal economic shock absorber mechanisms such as investment in non-oil sectors of agriculture, manufacturing, and small and medium scale investment in Nigeria, South Africa, and Kenya. Similarly, from the negative sustained shocks throughout the period, it can be deduced that high dependence on oil revenues and the

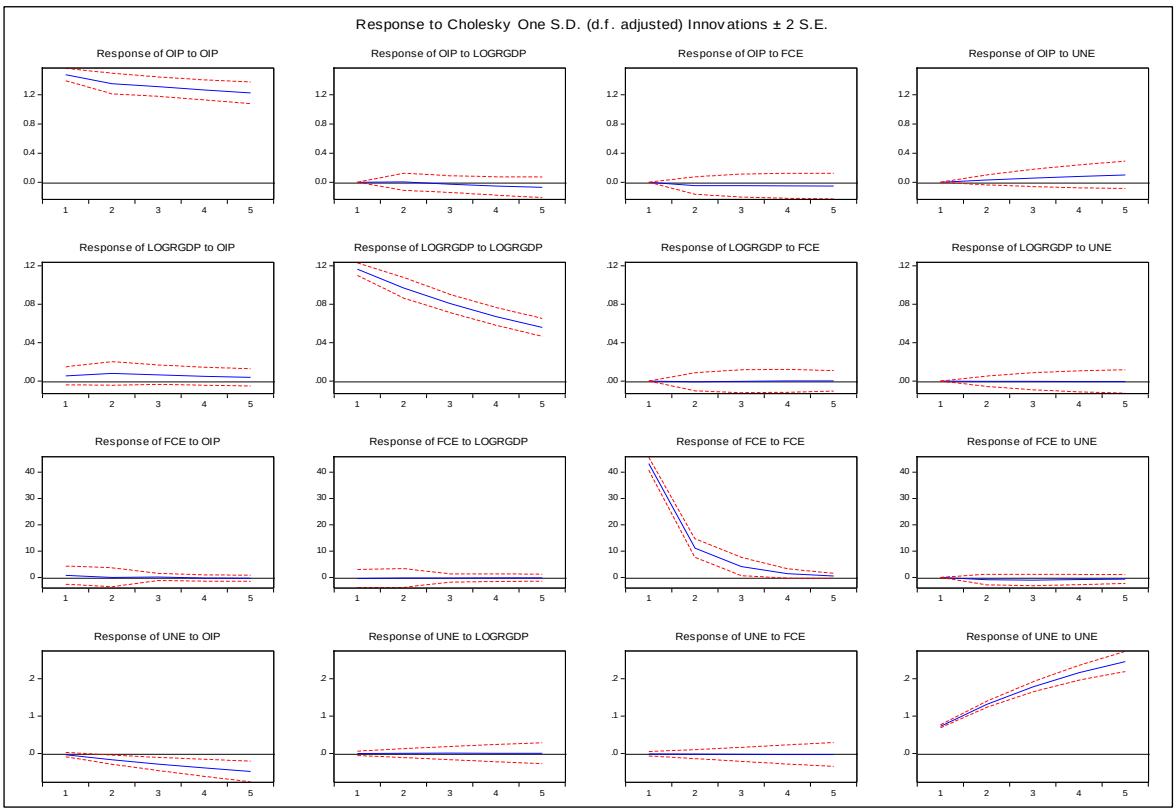
fluctuations in oil prices have a significant impact on the economy. The covid-19 economic lockdown, restriction of products-service, and decrease in oil demand also instigated a negative response resulting in to increase in the unemployment rate and a decrease in the economy. The negative trend also revealed a ripple effect of heavy reliance on oil revenues, and the fluctuations in oil prices diminish the growth prowess recorded in the past. The increase in prices of commodities over the period in some oil-importing countries has aided in managing the oil price increase. This is evident in Nigeria having and South Africa having positive responses towards global oil price increase. Nigeria is a major exporter of oil, cocoa, and rubber.

The Nigerian economy is keenly driven by performance in the agriculture, trade, telecommunications, manufacturing, and film industries; South Africa majorly export gold, diamonds, and platinum with other metals and minerals, machinery, and equipment; Kenya majorly exports Tea, cut flowers, refined petroleum, coffee, and Titanium. The negative effect of the oil price shock on the economic welfare and unemployment are offset in revenue earning and saving from other exports. The low export low of other metals and minerals, machinery, and equipment in South Africa during the pandemic fall short to offset the hostile impact of oil price shock. South Africa needs to create a favourable business and economic climate that will synergise the black and white community's economic prowess. To boost revenue earnings and saving that will aid the government to mitigate future oil price shocks. This result collaborates with the findings of Effiong (2014) and Wang et al. (2013) which are positive and significant. In developing countries consumption is generally considered the preferred single indicator of well-being among economists (Pradhan, 2001). Arora (2013) lends credence to the preceding statement by noting that consumption as a measure of well-being of the people is advantageous since it is directly important to consumers which are not covered in the GDP. Oil price shocks granger cause inflation. From an empirical front, oil price fluctuations deter potential growth in the economy which is consistent with the findings of Alley et al. (2014). Madueme and Nwosu (2010); Babayev (2010) noted that oil price fluctuations instigate growth and investment in other sectors. Aremo et al. (2012), Ogbonna and Ebimbowei (2012), Abdul-Rahmoh et al. (2013), Riman et al. (2013), Ijirshar (2015), Aregbeyen and Kolawole (2015), and Ademola et al (2015) reported a positive nexus between oil price fluctuation and economic growth.

Kenya



South Africa



Nigeria

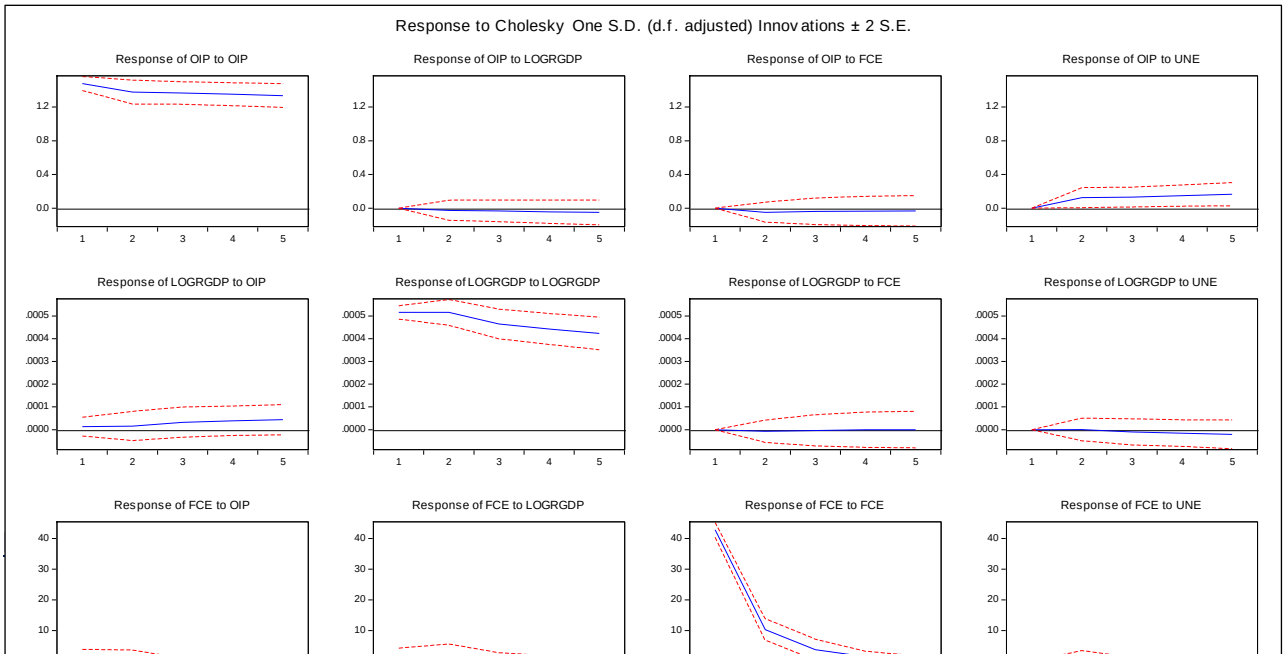


Table 9: Variance Decomposition

Kenya	Variance Decomposition of COV and OIP							
Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5	Shock6	Shock7
1	26.72778	0.013664	99.98634	0.000000	0.000000	0.000000	0.000000	0.000000
2	37.98837	0.194280	98.95692	0.001215	0.051895	0.734282	0.040723	0.020683
3	46.70282	0.254469	98.45108	0.007225	0.070883	1.079346	0.119643	0.017356
4	54.03851	0.293674	98.07912	0.024639	0.077187	1.368348	0.143529	0.013505
5	60.46132	0.324312	97.76075	0.052177	0.081570	1.633168	0.136686	0.011335
South Africa	Variance Decomposition of COV and OIP							
Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5	Shock6	Shock7
1	348.6170	0.000200	99.99980	0.000000	0.000000	0.000000	0.000000	0.000000
2	478.4427	0.069576	99.82517	0.001580	0.049785	0.024616	9.490006	0.029260
3	580.4328	0.080873	99.64518	0.012740	0.068610	0.078864	0.028828	0.084901
4	666.5296	0.084464	99.41529	0.044457	0.084099	0.153206	0.054034	0.164449
5	742.4209	0.085749	99.15305	0.090320	0.098501	0.243935	0.064197	0.264243
Kenya	Variance Decomposition of COV and OIP							
Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5	Shock6	Shock7
1	4.906621	0.018687	99.98131	0.000000	0.000000	0.000000	0.000000	0.000000
2	8.307345	0.316111	99.20019	0.015766	0.057190	0.375590	0.030435	0.004720
3	11.20365	0.499067	98.83483	0.028587	0.063114	0.540228	0.025611	0.008567
4	13.72624	0.643637	98.51872	0.045547	0.063223	0.688595	0.020243	0.020037
5	15.94251	0.757924	98.22318	0.062749	0.061408	0.840960	0.017227	0.036551

Source: Author (2021)

The variance decomposition, presented in Table 9, indicated that COV and OIP largely are significantly is driven by themselves in the first quarter of the period. Accounting for about 99.9% of its forecast error. From the third shock period to the seventh shock period, all the variables of economic welfare and unemployment on average respond differently to the shock of COV and OIP forecast error.

6. Conclusion and Policy

The study empirically demonstrates that, in both the short and long run, oil price shocks and the Covid-19 pandemic via its safety protocols, various restrictions and other non-economic and financial factors instigate the decrease in oil price, demand decline, unemployment rate increase, and diminishing economic welfare in study countries. The impulse function analysis revealed that oil price and covid-19 shock have a reverse effect on unemployment and economic welfare. Influenced by covid-19 pandemic and oil price shocks. Suggesting that economic welfare and unemployment rate are positively co-integrated showing a long-run equilibrium nexus. Theoretical literature asserts that oil price shocks influence economic activities through various transmission mechanisms channels of supply-demand side effects, unexpected effect, sectoral adjustment effect, inflation effect, and real balance effect.

The supply-side effect revealed that a unit increase in oil price shocks triggers marginal-production costs increase and diminishes production level, economic welfare, growth, and development. The demand side effect also revealed the adverse effect of the covid-19 pandemic and oil price shocks on investment and economic welfare, inequality gap, poverty, unemployment, high cost of living among others. The inflation effect revealed that oil price and covid-19 shocks trigger domestic inflation. Debate on covid-19 pandemic and oil price shocks revealed that oil price increases affect net oil-importers while benefiting net oil-exporters. The response to covid-19 and oil price shock by indicators of economic welfare and unemployment rate in Nigeria, South Africa, and Kenya are similar to other African countries. The VECM empirical analysis indicates that oil price shock mirrors a change in the price of oil due to an unanticipated change in oil market fundamentals (supply-demand). The findings are consistent with the study of Nafula, Kyalo, Munga, and Ngugi (2020) in Kenya; Nigeria Amaefule (2020) in Nigeria; Ehikioya, Omankhanlen, Babajide, Osuma, and Omodero (2020) in sub-Saharan Africa and Ozili (2020) and Ataide, Abomaye-Nimenibo, and Samuel (2021) in Nigeria. Previous studies on this issue ignore the effect of the covid-19 pandemic on economic welfare and unemployment. Oil price is critical to the economy given its web of influence on other macroeconomic variables such as exchange rates, economic growth, inflation rate, unemployment, and welfare among others. From the findings of this paper, we recommend economic diversification, saving during the oil boom, and investment, particularly in the agricultural and manufacturing sectors. Youth empowerment policies that would help reduce the rate of unemployment and annual budget allocation for future pandemics.

References

Ademola, I.S., Olasode, O.S., Raji, O.A., Adedoyin, A.O. (2015), Government expenditure, oil revenue and economic growth in Nigeria. *International Journal of Economics, Commerce and Management*, 3(5), 180-202.

Akinleye, S.O., Ekpo, S. (2013), Oil Price Shocks and Macroeconomic Performance in Nigeria. Available from: http://www.redalyc.org/ article.oa?id=32329695008.

Alley, I., Asekomeh, A., Mobolaji, H., Adeniran, Y.A. (2014), Oil price shocks and the Nigerian economy growth. European Scientific Journal, 10(19), 375-391.

Al-Mogren (2020) The Impact of Oil Price Fluctuations on Saudi Arabia Stock Market: A Vector Error-Correction Model Analysis. *International Journal of Energy Economics and Policy*, 2020, 10(6), 310-317.

Amaefule C (2020) Covid-19 Lockdown, Slump in Global Oil price, and Policy Recovery Options: The Nigerian Experience. *International Journal of Research and Scientific Innovation* (IJRSI) | Volume VII, Issue IV, April 2020 | ISSN 2321–2705

Aregbeyen, O., Kolawole, B.O. (2015), Oil revenue, public spending and economic growth relationships in Nigeria. Journal of Sustainable Development, 8(3), 113-123.

Aremo, A.G., Orisadare, M.A., Ekperiware, C.M. (2012), Oil price shocks and fiscal policy management: Implication for Nigerian economic planning. *International Journal of Development and Sustainability*, 1(3), 1121-1139.

Arora, V. (2013), Alternative Measures of Welfare in Macroeconomic Models. Washington D.C: US. Energy information administration.

Babayev, M. (2010), The Impact of Oil Price Shocks on Economy: Empirical Evidence from Azerbaijan (A master's thesis). Budapest, Hungary: Department of Economics Central European University.

Basher, S.A., Haugb, A.A., Sadorsky, P. (2012), Oil prices, exchange rates, and emerging stock markets. Energy Economics, 34(1), 227-240.

Effiong, E.L. (2013), Exchange Rate Dynamics and Monetary Fundamentals: A Cointegrated SVAR Approach for Nigeria. Uyo: Mimeograph, Department of Economics, University of Uyo.

Effiong, E.L. (2014), Oil price shocks and Nigeria's stock market: What have we learned from crude oil market shocks? OPEC Energy Review, 38(1), 36-58.

Ehikioya, B, I., Omankhanlen, E, A., Babajide, A, A., Osuma, G, O., & Omodero, C, O., (2020) Oil Price Fluctuations and Exchange Rate in Selected Sub-Saharan Africa countries: A Vector Error Correction Model Approach. International Journal of Energy Economics and Policy, 2020, 10(6), 242-249.

Hamilton, D.J. (1983), Oil and the macro-economy since World War II. The Journal of Political Economy, 9, 228-248.

Hamilton, J.D. (2009a), Understanding crude oil prices. Energy Journal, 30, 179-206.

Hamilton, J.D. (2009b), Causes and Consequences of the Oil Shock of 2007-2008, Brookings Papers on Economic Activity. p215.

Ijirshar, V.U. (2015), The empirical analysis of oil revenue and industrial growth in Nigeria. African Journal of Business Management, 9(16), 599-607.

Kilian, L., Park, C. (2009), The impact of oil price shocks on the US stock market. International Economic Review, 50, 1267-1287.

Krugman, P. (1983b), Oil shocks and exchange rate dynamics. In: Frenkel, J., editor. Exchange Rates and International Macroeconomics. Chicago: University of Chicago Press.

Madueme, S., Nwosu, O.C. (2010), Oil price shocks and macroeconomic variables in Nigeria. International Journal of Research in Arts and Social Sciences, 2, 333-342.

Manasseh, C, O., Abada, F, C., Ogbuabor, J, E., Okoro, E. Okoro., Aja, E, E., Ozuzu, K, C. (2020). Oil Price Fluctuation, Oil Revenue and Well-being in Nigeria. International Journal of Energy Economics and Policy, 9(1), 346-355.

Manasseh, C, O., Ihedimma, G, I., Abada, F, C., Nwakoby, F, C., Njoku, B, O., Kesuh, J, T., Okeke, G C., Alio, F. C., & Onwumere, J, U, J (2020). Did Global Financial Crisis Worsen Oil Price Volatility and Banking Sector Nexus in Selected ECOWAS and G-7 Member Countries? International Journal of Energy Economics and Policy, 10(6), 390-395.

Ogbonna, G.N., Ebimobowei, A. (2012), Impact of petroleum revenue and the economy of Nigeria. The Social Sciences, 7(3), 405-411.

Olomola, P.A., Adejumo, A.V. (2006), Oil price shocks and macroeconomic activities in Nigeria. International Research Journal of Finance and Economics, 3, 28-34.

Ozil, P., 2020b. Covid-19 in Africa: socio-economic impact, policy response, and opportunities. Int. J. Sociology. Soc. Policy. Vol. ahead-of-print No. ahead-of-print.

Ozili, P.K., 2020a. Covid-19 Pandemic and Economic Crisis: The Nigerian Experience and Structural Causes (April 2, 2020). Available at SSRN: https://ssrn.com/abstract ¼3567419.

Pradhan, M. (2001), Welfare Analysis with a Proxy Consumption Measure Evidence from a Repeated Experiment in Indonesia. Cornell Food and Nutrition Policy Program. Working Paper (126).

Riman, H.B., Akpan, E.S., Offiong, A.I., Ojong, C.M. (2013), Nexus between oil revenue, non-oil export and industrial output in Nigeria: An application of the VAR model. International Journal of Financial Economics, 1(2), 48-60.

Ruzvidzo, T., (2020). The Economic Impact of COVID-19 on African Cities Likely to Be Acute through a Sharp Decline in Productivity, Jobs & Revenue.

Salisu, A.A., Mobolaji, H. (2013), Modelling returns and volatility transmission between oil price and US-Nigeria exchange rate. Energy Economics, 39, 169-176.

Udo E, S, Abner, I, P, Inim, V, and Akpan E, J (2020) SARS-CoV-2 Pandemic on the Nigerian Educational System, *International Journal of Management,* 11(10), 2020, pp. 626-635.

Wang, Y., Wu, C., Yang, L. (2013), Oil price shocks and stock market activities: Evidence from oil-importing and oil-exporting countries. Journal of Comparative Economics, 41, 1220-1239.

WHO, (2020a), Coronavirus Disease (COVID-19). https://www.who.int/docs/default-source/coronaviruse/situation-reports/20201005-weekly-epi-update-8.pdf.

WHO, (2020b) Coronavirus Disease (COVID-19). https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200523-COVID-19-sitrep-124.pdf?sfvrsn¼9626d639_2.

World Bank. (2020), World Development Indicators. Washington DC: World Bank.