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Impact of COVID-19 and Oil Prices on Economic Policy: Evidence from Nigeria and South Africa

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Abstract
The spread of COVID-19 has brought unprecedented distortions to the global economy, leading to the loss of income and a high unemployment rate. These distortions pose serious challenges to policymakers, due to wide-scale uncertainties faced by low and middle-income countries. As such, this study employed the vector autoregressive model (VAR) to capture and compare the relative impact of COVID-19 shock and crude oil prices on policy uncertainty in Nigeria and South Africa using daily confirmed cases and deaths. We concluded that the number of new cases/deaths of COVID-19 has no significant effect on policy uncertainty in Nigeria and South Africa in line with earlier studies. Furthermore, crude oil prices tend to reduce economic uncertainty in Nigeria, contrary to theoretical and related findings, meanwhile, crude prices increase economic uncertainty in South Africa. As a recommendation, both countries should reinforce the existing fiscal and monetary measures such as increasing subsidies to businesses as well as improving access to credit schemes for firms, especially as the second wave of COVID-19 is resonating around the world. This will further cushion the effect of the dwindling crude oil prices, thereby, reducing the policy uncertainty in both countries.

Keywords: COVID-19, Economic Policy, Nigeria, South Africa
JEL Classification Codes: E52, E60, F62, G01

1. Introduction

The spread of COVID-19 worldwide poses serious global health challenges, with extraordinary socio-economic implications. The channels through which the pandemic affects various countries are mainly through its spread and the containment measures adopted by policymakers of respective governments, directly impacting on health and the economy. The methods adopted by most countries to curtail the spread of corona virus include; the closing of borders and partial or

complete lockdowns of economies which among other things, have led to the temporary closure of businesses, schools, and social services (Gondwe, 2020). However, these containment measures, constrain economic activities which tend to decrease African economies' productivity, and a decline in their overall domestic and international trade. Specifically, these measures include total lockdown, social distancing, and restrictions on the mobility of human capital, goods, and services. These measures have amplified the extant economic crises and considerably crippled almost all key growth drivers of many economies, leading to an overall reduction in their export and internally generated revenues (Barro, Barro, Ursua & Weng, 2020; Baker, Bloom, Davis & Terry, 2020). All these economic challenges resulting from the shock in COVID-19 have created huge uncertainty in the global economy.

Due to these challenges, different institutions have estimated the anticipated economic losses posed by the adopted measures. For instance, many African countries have imposed travel restrictions and closing of borders which have greatly affected the tourism sector. For example, the International Air Transport Association (IATA) contributed approximately US$55.8 billion and 2.6% of the total GDP in Africa; supported 6.2 million jobs before the advent of COVID-19 International Air Transport Association (2020). These restrictions affected other international airlines including Ethiopian Airlines, Egypt Air, Kenya Airways, South African Airways, etc. The immediate effect is partial unemployment of airline staff and equipment. Ordinarily, airlines transported about 35% of the World's trade and supported job creation in the travel and tourism value chain mostly dominated by SMEs (ibid).

The tourism sector employs more than a million people in Nigeria, Ethiopia, South Africa, Kenya, and Tanzania, which constitutes more than 20 percent of the total employment in Seychelles, Cape Verde, São Tomé and Príncipe, and Mauritius. During the past crises, including the 2008 financial crisis and the 2014 commodity price shock, Africa's tourism sector experienced losses of up to $7.2 billion. On average, the tourism and travel sectors in Africa have recorded a total loss of approximately $50 billion due to the Covid-19 shock and at least two million direct and indirect jobs. In summary, the International Air Transport Association (2020) projected revenue losses of up to US$113 billion, while the United Nations Economic Commission for Africa (UNECA) projected a loss in revenue of approximately US$65 billion among Africa's top 10 fuel exporting economies. Although South Africa is highly developed, with advanced infrastructure, the economy, which grew by 0.2% in 2019 as against 0.8% in 2018, is expected to fall to -5.8% at the end of 2020 due to the COVID-19 shock. However,

projections from International Monetary Fund, 2020) showed that the economy might grow by 4% in 2021.

Empirical evidence has shown that hikes in financial uncertainty are highly correlated with a fall in economic activities (Ludvigson, Sydney, Sai & 2021; Caggiano, Castelnuovo & Kima, 2020). Other strands of studies such as Faria-e-Castro (2020); Eichenbaun, Rebelo & Trabandt (2020); Baker et al. (2020); Yilmazkuday (2020); Bakaert, Engstrom, 2020) have explored the macroeconomic impact of COVID-19 on the US economy. Ludvigson et al. (2021) for example, used the VAR framework to measure the macroeconomic impact of Covid-19 shock and to gauge its impact with past disasters in the United States. In Africa, Nondive (2020) and Sumner; Hoy and Ortiz-Juarez (2020) examined the short-run effect of COVID-19 on poverty using different scenarios and found a contraction in household consumption.

The uncertainty caused by COVID-19 shock is enormous for developing countries in particular because its effect has disrupted global trade (International Monetary Fund, 2022), slowed down the free flow of goods and services (Organisation for Economic Co-operation and Development, 2020) and restricted the movements of people (The World Bank, 2020) hence, the transfer of human capital internationally. Ironically, various containment policies have raised crude oil prices with far reaching effects on the on-export revenue of oil-dependent countries like Nigeria. Correspondingly, South Africa, suffered from a downturn in manufacturing output, export revenue, tourism among others. Hence, COVID-19 shocks have precipitated economic pressures and uncertainties in developing countries. As such, policymakers are confronted with the choice of containing the virus and sustaining the economy. Therefore, this study examined the relative impact of COVID-19 shock and oil prices on policy uncertainty in Nigeria and South Africa using the VAR model. The remaining sections of the paper are organized as follows, section 2 presents a review of related studies. Section 3 ushers in the methodology. Section 4 presents the results and discussion, while Section 5 highlights the conclusion and recommendations.

2. Literature Review

The COVID-19 pandemic has struck developing countries in a period of economic weakness and macroeconomic vulnerability. As the pandemic spreads across the Continent, its health, economic and social challenges are increasingly evident. It has plunged the economies of advanced and developing countries into recession for the first time since the great depression. Both economies have used the tools of fiscal and monetary policies to respond to the pandemic in a way that the world has never experienced before. The literature on the socio-economic impact of

COVID-19 and the consequences of each policy response to the pandemic is still ongoing. The nascent literature has explored the impact of the coronavirus using daily, weekly, or monthly data set, and they mostly focused on specific sectors such as tourism, mining, healthcare, and education. The extent to which the spread of the corona virus had constrained the progress of developed and developing economies was brought to the fore by (Haleem, Javaid and Vaishya, 2020). Their study indicated that the spread of the virus eased back of the assembling of basic merchandise, interrupted the global supply chain, and was responsible for huge financial loss to businesses.

The pandemic triggered a wave of uncertainties causing a negative supply shock and impacted negatively on financial systems. For instance, Fornaro and Wolf (2020) utilized a basic model which explains the impact of the Coronavirus on supply shock. They charged monetary authorities to correct supply shock uncertainties on economic activities with policy tools. Also, Ramelli and Wagner (2020) demonstrated that a health emergency like COVI-19 snowballs into an economic catastrophe through its impact on the financial system. Similarly, Barro, Ursua and Weng (2020) indicated that the Great Influenza Pandemic of 1918–1920 prompted economic slowdown and diminished the returns to stocks. Similarly, Ozili and Arun (2020) found that the extended number of lockdown days, policy responses, and limits on worldwide, travel, seriously influenced the degree of worldwide economic activities in both the real and financial sectors variables like stock prices are impacted globally by the pandemic. Also, Zhang et al. (2020) asserted that the coronavirus (COVID-19) has created an unparalleled level of risk in the global financial market, inflicting significant losses on investors in a short time frame.

Benmelech and Tzur-Ilan (2020) analyzed the determinants of fiscal and monetary policies during the Covid-19 crisis, they found out that high-income countries applied larger fiscal policies than lower-income countries, while a country's rating measures government expenditure during the pandemic. During the crisis, high-income countries use unconventional monetary policy due to their historically low-interest rates before the crisis. The policy implication of the findings is that countries with lower credit ratings may find it difficult to deploy fiscal policy tools. In another study, Gondwe (2020) estimates show that due to COVID-19 African economies will experience a fall in GDP with smaller economies experiencing more contraction relatively. This may be driven by a fall in commodity export as the economies of the importers are also faced with sluggish growth. The attendant loss from both exports and tax revenue will complicate the government's fiscal position and capacity to respond to the crisis. According to the estimate, the regional

average revenue loss is about 5% with merchandise export contracting by about 17%.

Faria-e-Castro (2020) examined the evolution of the COVID-19 crisis on the U.S economy using DSGE. The author considered the effects of a policy package to cushion the impacts on vulnerable households and businesses as well as to stabilize the economy. Eichenbaum, Rebelo and Trabandt (2020) endogenized the dynamics of the epidemic by synchronizing an epidemiological SIR model with health policy variables. Also, Baker, Bloom, Davis and Terry (2020) examined the impact of the uncertainty induced by the pandemic crisis on the United States (US) economy by using a forward-looking approach. Yilmazkuday (2020) investigated the welfare costs of reduced mobility due to the Covid-19 pandemic in the US using daily-level mobility data, he finds that the lockdown led to significant household welfare costs. Also, Bekaert et al. (2020) used an identification scheme to extract aggregate demand and supply shocks for the US economy from survey data on inflation and real GDP growth to project future macroeconomic outcomes. They concluded negative shocks in aggregate demand were responsible for two-thirds of the decline in 2020: Q1 GDP during the spread of the virus contrary to a staggering decline in GDP in 2020: Q2, where a reduction in aggregate supply was responsible for the negative shocks. Thus, a slow recovery of the economy is a result of the long-lasting effects of the supply shock.

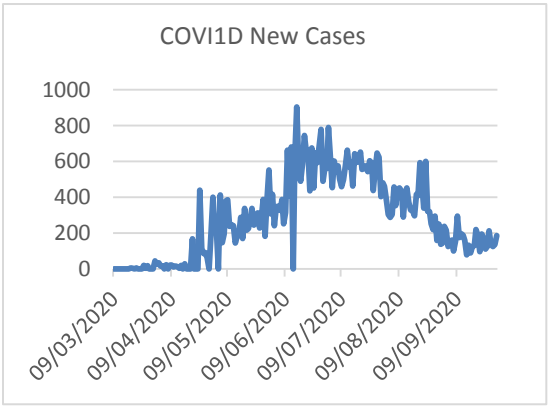
Morsy, Balma and Mukasa (2020) examined the impact of the pandemic on the household welfare of some selected African countries. The model was calibrated to account for informality, the Dynamic Stochastic General Equilibrium (DSGE) result shows that the pandemic might reduce employment and shrink aggregate demand in the country thus, precipitating recession and widening both fiscal and current account deficits in Africa. In Nigeria, the literature on the impact of COVID-19 on the economy is scanty. For instance, Oruonye and Ahmed (2020) found that the episode and spread of COVID-19 illness in Nigeria prompted fast shutdowns in urban communities and states which seriously affected the travel industry. Ozili (2020a) examined the impact of COVID-19 spillover on Nigeria and discovered that the prevailing structural weaknesses in Nigeria contributed to making the crisis more severe in the country. Also, empirical evidence in Nigeria shows that the outbreak of COVID-19 and the measures to contain the spread of the virus have hindered the free flow of goods and caused uncertainty in capital flows, thus, causing exogenous shocks to affect both nominal and real exchange rate (Kekere & Isah, 2022). This study adds to the extant studies of how the spread of corona virus impacts on macroeconomic variables, policy uncertainties and oil prices in Nigeria and South Africa.

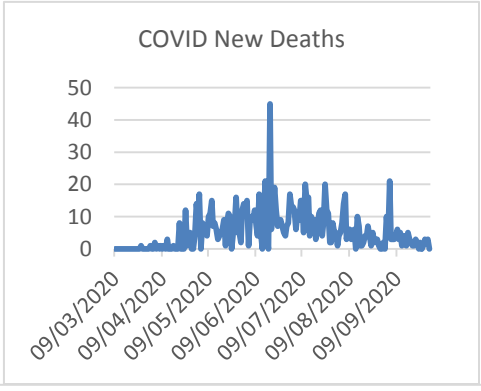
3. Methodology

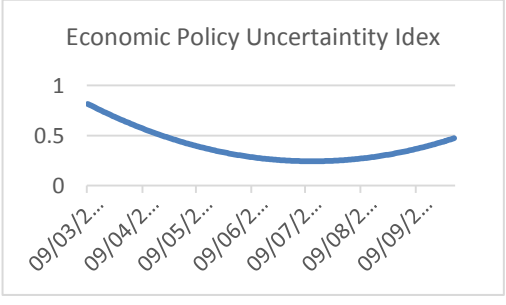
3.1. Data and variables

This study analyzed the effect of COVID-19 on the economic policy uncertainty (EPUI) for Nigeria and South Africa using daily time series data from 9 March 2020 to 30 September 2020, making a total of 206 observations. Data for COVID19NC (COVID-19 new cases reported in the last 24 hours) and COVIDND (COVID-19 new death reported in the last 24 hours) were extracted from the World Health Organisation's website (WHO). Economic Policy Uncertainty Index (EPUI) was collected from the Federal Reserve Bank of St. Louis data website and Crude Oil Prices (COP) were extracted from the Market Business Insider data bank. Figures 1 and 2 show time series trends and curves of all the variables. To measure policy-related economic uncertainty, the index used was constructed from three types of underlying components. The first and most flexible component quantifies newspaper coverage of policy-related economic uncertainty. This newspaper-based approach was used for the majority of other countries hosted on this site. The graphs of COVID-19 new cases for both countries progressively assume an upward trend, which declined with time when the respective governments were able to flatten the curve of the pandemic through various containment measures. The reported cases of new deaths followed upward trends and fluctuated downwardly from 18 June 2020 for Nigeria and 24 July 24, 2020, in South Africa. EPUI for Nigeria countries has a persistent negative slope, while EPUI for South Africa has a positive slope. COIP trended downwardly with a sharp decline on 19 April and assumed an upward trend that fluctuated slightly in a downward fashion thereafter.

Figure 1 and 2 shows that the Covid-19 shock has precipitated huge uncertainties in economic welfare. From both health and economic standpoints, it has caused supply and demand shocks. This has profound implications on the behavior of economic variables. According to Baker et al. (2020), financial volatility recorded its highest value in March 2020, exceeding the highest value recorded during the Great depression.







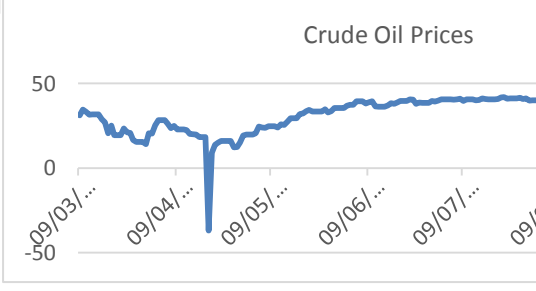


Figure 1: Graphs of COVID-19 Daily Cases Daily Deaths, EPUI and World Nigeria.
Source: Source: Authors' Plot.

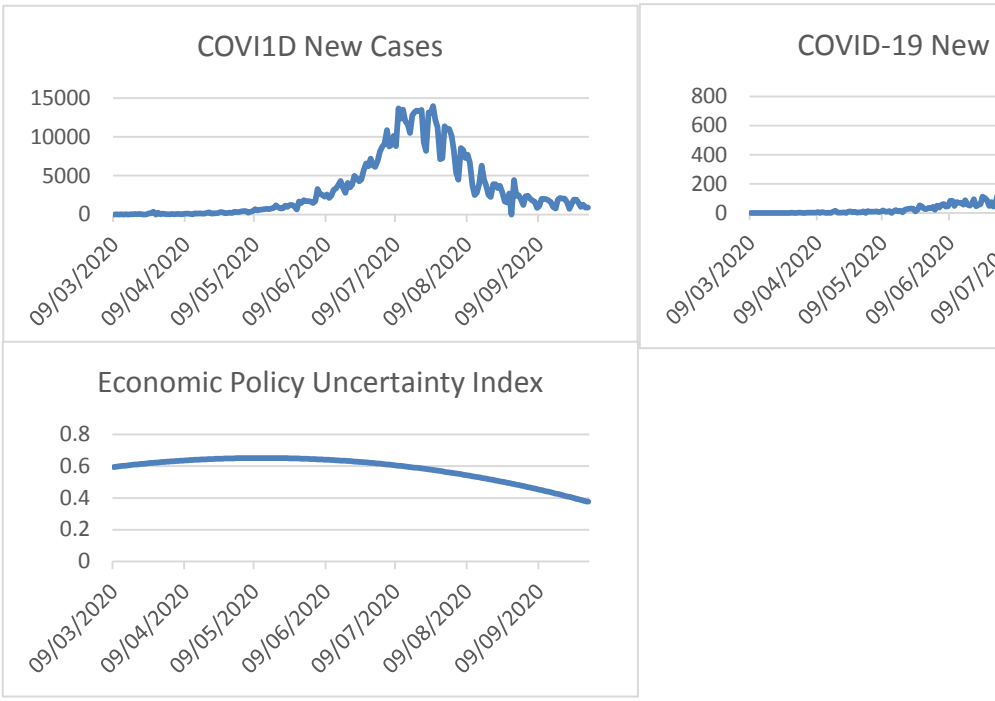


Figure 2: Graphs of COVID-19 Daily Cases Daily Deaths, EPUI and World Crude Oil Price for South Africa.
Source: Authors' Plot.

3.2. Estimation Model

Standard Vector Autoregressive Models model have been used to analysed the response of economic activities to COVID-19 shocks and crude oil price shocks in Nigeria and South Africa. Most importantly, the VAR model is often used to capture and analyze the effect of external and domestic shocks on a variable in an economy and how the effect evolves with time (Gudeta, Arero & Goshu, 2017; Ulrichs, 2018; Kronborg, 2021). Recent studies have lent credence to the VAR model to either analyze the evolution of the impact of COVID-19 on macroeconomic variables or forecast its future trend (Rajab, Kamlov & Cherukuri, 2022; Wang & Zhou, 2021; Shang, et al., 2021). The COVID-19 outbreak was unexpected and has redirected global macroeconomic policies. World Bank (2020) stated that the unexpected

shock of Covid-19 might narrow down the global economy. International Monetary Fund (2021) summarizes the policy responses of macroeconomic variables of affected countries, including Nigeria and South Africa, while the United Nations Conference on Trade and Development [UNCTAD], (2022) presents the world economic situation after the COVID-19 shock and future policy challenges. Thus, policy responses due to COVID-19 shocks can be modeled using the VAR model.

An important use of the VAR model related to this study is to quantify the evolution of economic policies over time, which can be tracked using the impulse response function and variance decomposition (González-Rivera, 2019). However, the effect of omitted variables will form part of the residuals leading to major distortions of the impulse responses (Hendry, 1995). Thus, a careful specification of the VAR model followed by lucid analysis will minimize the effect of the varying distortions.

The standard practice of the VAR model is to report the impulse response functions because it gives a clear understanding of the relationship than the VAR regression (Stock & Mark, 2001). A critical assumption of this type of model is that all the variables must be integrated at different orders and not co-integrated. Thus, the VAR model employed in this study is:

$$Y_t = A(L)Y_{t-1} + U_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where $Y_t$is an (n x 1) vector of endogenous variables.$Y_{t-1}$is the lag term for the respective variables that form an (nxn) matrix of an autoregressive coefficient vector of i = 1, 2....k. $U_t$is an (nx1) vector of structural shocks with the variance-covariance matrix: E($U_t U_t$) $= \rho\sigma^2$. The estimated VAR model with the different endogenous variables is as follows:

$$\begin{bmatrix} EPUI_t \\ COVID19NC_t \\ COVID19ND_t \\ COIP_t \end{bmatrix} = A_1 \begin{bmatrix} EPUI_{t-1} \\ COVID19NC_{t-1} \\ COVID19ND_{t-1} \\ COIP_{t-1} \end{bmatrix} + \dots + A_p \begin{bmatrix} EPUI_{t-p} \\ COVID19NC_{t-p} \\ COVID19ND_{t-p} \\ COIP_{t-p} \end{bmatrix} + U_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where EPUI is the economic policy uncertainty index, COVID19NC and COVID19ND are new cases/deaths of COVID19 and COIP is crude oil prices. The Akaike Information Criterion (AIC), Schwarz Criterion (SC), Sequential modified LR test statistic, Final prediction error (FPR), Hannan-Quinn (HQ) information criterion were used to determine the lag length of the estimated model.

The Augmented Dickey Fuller (ADF) test was employed to test for the order of integration of all the series following Greene's (2003) approach and model as follows:

$$Y_t = \alpha + \beta Y_{t-1} + \sum_{i=1}^{n} \beta_j \Delta Y_{t-1} + \varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

$$Y_t = \alpha + \gamma t + \beta Y_{t-1} + \sum_{i=1}^{n} \beta_j \Delta Y_{t-1} + \varepsilon \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

Equations (3) and (4), indicate ADF tests without trend and with trend respectively. In carrying out the *ADF* unit root test, we stated the null hypothesis $\beta = 0$ against the alternative hypothesis $\beta < 0$, and *ADF* statistic is compared to an observed Mackinnon critical value of 5% level of significance. If ADF statistic is greater than the Mackinon criterion, the null hypothesis is rejected hence the time series is stationary.

4. Results and Discussion

4.1. Summary Descriptive Statistics

The descriptive statistics of all variables are reported on Tables 1 and 2. The average number of new cases of COVID-19 in Nigeria is approximately 285, while the average number of new deaths approximates 5, daily. The average economic policy uncertainty index (EPUI) is approximately 0.4 with a minimum value of 0.24 and a maximum value of 0.8. Crude oil price (COIP) has a mean value of -36 with an average price of 33. For South Africa, the average number of new cases of COVID-19 is approximately 3265, while the average number of new deaths approximates 81. The average economic policy uncertainty index (EPUI) is 0.5 with a minimum value of 0.37 and a maximum value of 0.65.

Table 1: Summary Statistics for Nigeria

	COVI1DNC	COVIDND	EUPI	COILP
Mean	284.6699	5.393204	0.390209	33.40146
Median	249.0000	4.000000	0.338701	38.21500
Maximum	904.0000	45.00000	0.816239	43.21000
Minimum	0.000000	0.000000	0.241988	-36.98000
Std. Dev.	225.2179	5.931787	0.152830	10.32110
Observations	206	206	206	206

Source: Authors' calculation

Table 2: Summary Statistics for South Africa

	COVI1DNC	COVIDND	EUPI	COIP
Mean	3264.879	80.90777	0.581926	33.40146

Median	1714.500	49.50000	0.614665	38.21500
Maximum	13944.00	572.0000	0.651443	43.21000
Minimum	0.000000	0.000000	0.376028	-36.98000
Std. Dev.	3904.758	97.10762	0.077264	10.32110
Observations	206	206	206	206

Source: Authors' calculation

4.2 Unit Root Test

The empirical analysis began with a prior investigation of the stationary properties of the time series using the Augmented Dickey-Fuller (ADF) test. The test results reported on Table 1 indicate that COID19NC, COVID19ND, and COIP are stationary at first difference, while EPUI is stationary at levels. Hence, the reduced-form VAR was adopted since all the variables have different orders of integration. In this regard, four models were estimated.

Table 3: Unit Root Test Results

Variables	**ADF Test** (with intercept and trend for COID19NC, COVID19ND, COIP and with no trend for EPUI)			**ADF Test** (with intercept and trend for COID19NC, COVID19NDand with no trend for EPUI		
	Nigeria			**South Africa**		
	Levels	**1st Difference**	**Order of Integration**	**Levels**	**1st Difference**	**Order of Integration**
COVID19NC	-0.851	-12.785 ***	**I(1)**	-0.0519	-12.579 ***	**I(1)**
COVID19ND	-3.377	-14.691***	**I(1)**	-2.489	-11.402 ***	**(1)**
EPUI	-12.645 ***		**I(0)**	20.423 ***		**I(0)**
COIP	-2.828	-8.661 ***	**I(1)**	-2.432	-7.351***	**I(1)**

NB: (1) 1%, 5%, and 10% level of statistical significance with critical values of -4.004, -3.318 and -3.139 for Nigeria and -3462, -2.875 and -2,572 in South Africa are represented by ***, **, and * respectively. indicate at 1%, 5%, and 10% respectively, with critical values of -4.004, -3.318 and -3.139 for Nigeria and -3462, -2.875 and -2,572 in South Africa. (2) The Akaike Information Criterion (AIC) was employed to select the optimal lag of the unit root estimation.

Source: Authors' calculation

4.3 Lag Selection Criteria and Serial Correlation Test

Tables 4 and 5 report the chosen lag length of the VAR model after estimation. The chosen lag length suggests that the results of the estimated VAR model are robust.
The different test criteria show that lag 1 is appropriate for Nigeria, while lag 2 is appropriate for South Africa.

Table 4: VAR Lag Selection Criteria for Nigeria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1502.087	NA	30.38817	14.76556	14.83062	14.79188
1	10700.13	23806.29*	3.95e-51*	-104.7072*	-104.3818*	-104.5756*

Table 5: VAR Lag Selection Criteria for South Africa

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3588.583	NA	2.33e+10	35.22140	35.28646	35.24772
1	-2236.898	2637.111	47809.67	22.12645	22.45176	22.25804
2	2198.711	8479.841*	7.28e-15*	-21.20305*	-20.61750*	-20.96618*

NB: * indicates lag order selected by criterion. LR: sequential modified LR test statistic (each at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion and HQ: Hannan-Quin information criterion
Source: Authors' calculation

4.4 Test for Stability

After establishing the optimal lag length, we tested for the stability of the estimated model. Figure 3 shows that the estimated VAR models for Nigeria and South are stable since all the roots lie inside the circle. Therefore, the estimated VAR models are robust and permit further analyses since all preliminary diagnostic tests have been fulfilled.

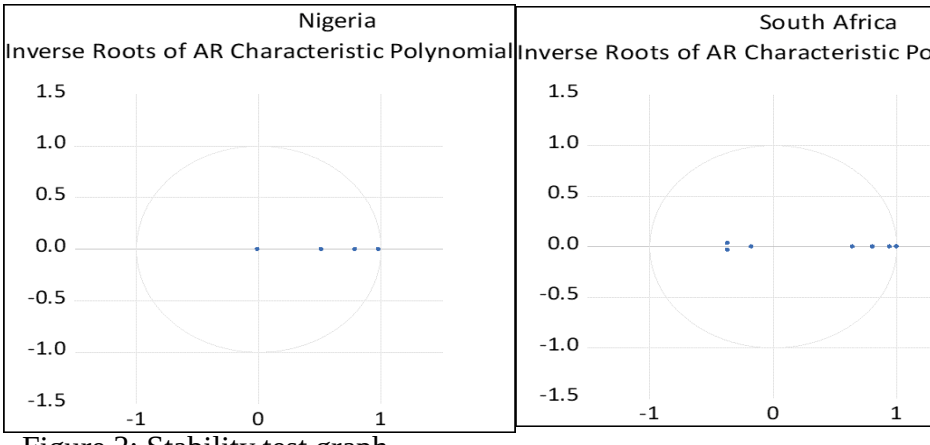


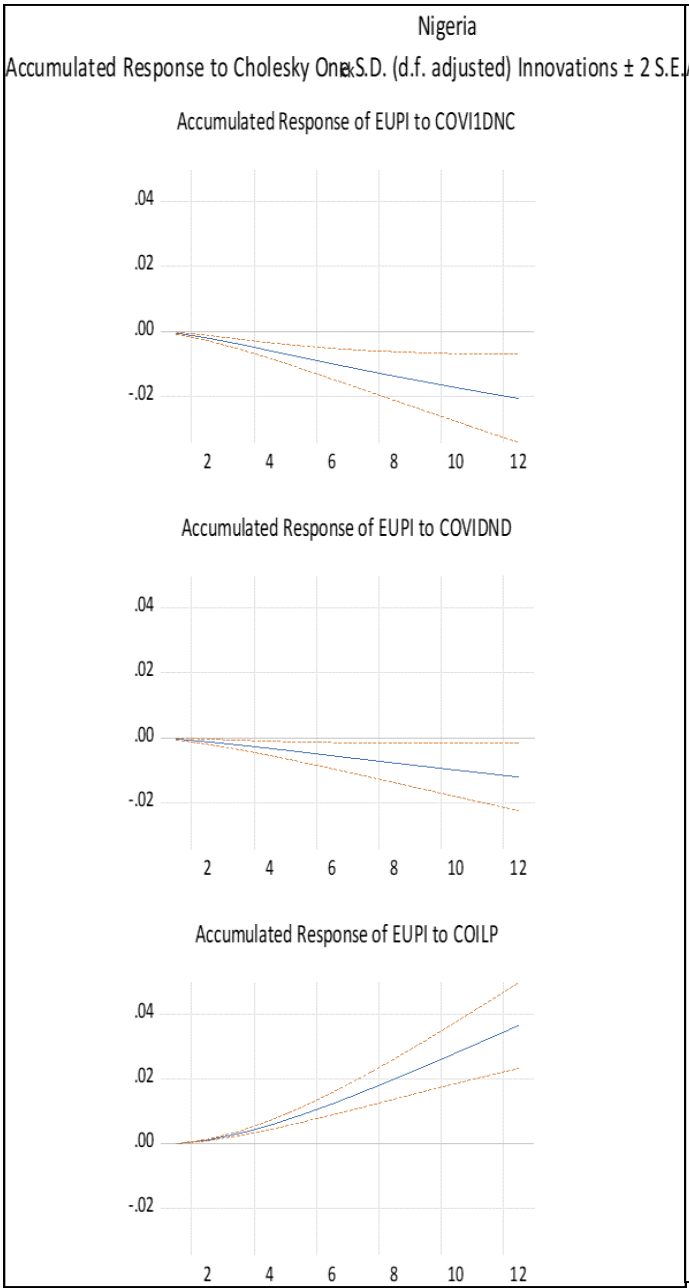
Figure 3: Stability test graph.

Source: Authors' plot

4.5 Impulse Response Results

Figure 4 shows the impulse response functions (IRFs) from the VAR estimation and how EPUI reacts to a one-standard deviation shock of the endogenous variables. The graphs show that a one-standard-deviation shock of both COVID19 new cases/deaths reduces the economic policy uncertainty for both countries. This result is plausible because Ramelli and Wagner (2020); Haleem et al. (2020) demonstrated that the emergency of COVID-19, constrained economic policies and disrupted the financial systems of many countries. A fall in the daily crude oil prices reduces Nigeria's economic policy uncertainty. Theoretically, this result is counterintuitive. However, Nigeria has experienced multiple oil shocks over the years and has been taking measures, implying that the daily decline of crude oil prices during the period of COVID19 might not have influenced Nigeria's EPUI.

Contrarily, South Africa's EPUI exhibits a significant inverse relationship with daily crude oil prices, implying that economic policy uncertainty will increase as daily crude oil prices decrease. This result for South Africa is consistent with the findings of Matuka (2020) for the US and Saeed and Ridoy (2020) for the UK.


Nigeria
Accumulated Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.
Accumulated Response of EUPI to COVI1DNC
.04
.02
.00
-.02
2
4
6
8
10
12
Accumulated Response of EUPI to COVIDND
.04
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Accumulated Response of EUPI to COILP
.04
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Figure 4: Impulse response functions of EPUI to COVID19NC, COVID19ND
Source: Authors' plot

5. Conclusion and Recommendations

Covid19 outbreak and the slump in crude oil prices have triggered unprecedented economic shocks in Africa. Making use of daily data, this study employed the VAR model to compare the responses of economic uncertainty to COVID-19 and crude oil prices in Nigeria and South Africa. We concluded that the daily cases/deaths of COVID-19 had an insignificant effect on Nigeria's and South Africa's economic policies in line with earlier studies. Furthermore, crude oil prices tend to reduce economic uncertainty in Nigeria, contrary to theoretical and related findings, implying that the relationship between the two does not necessarily hold at all periods. Contrarily, crude prices increase the economic uncertainty in South Africa.

As a recommendation, both countries reinforce the existing fiscal and monetary measures such as increasing subsidies to businesses as well as improving access to credit schemes for firms. This will also further cushion the effect of the falling prices in crude oil, reducing the economic uncertainty in South Africa.

References

Albulescu, C. (2020). Do COVID-19 and crude oil prices drive the US economic policy uncertainty? arXiv preprint arXiv:2003.07591. https://arxiv.org/ftp/arxiv/papers/2003/2003.07591.pdf.

Asiedu, E., & Adoteye, D. (2020). Government and institution measures in response to COVID-19.https://home.kpmg/xx/en/home/insights/2020/04/ghana-government-and-institution-measures-in-response-to-covid.html.

Baker, R., Bloom, S., Davis, J., & Terry, S. (2020). COVID-induced economic uncertainty, NBER Working Paper 26983, Cambridge, MA: National Bureau of Economic Research.

Barro, J., Ursua, F., & Weng, J. (2020), The Coronavirus and the Great Influenza Pandemic: Lessons from the 'Spanish Flu' for the Coronavirus's Potential Effects on Mortality and Economic Activity (No. W26866), National Bureau of Economic Research, Cambridge, MA. https://www.nber.org/papers/w26866.

Bedasso, B., & Cole, N. (2002). Africa's COVID-19 Budget Crunch. https://www.cabri-sbo.org/en/blog/2020/africas-covid-19-budget-crunch

Bekaert, G., Engstrom, E., & Andrey, E. (2020). Aggregate Demand and Aggregate Supply Effects of COVID-19: A Real-time Analysis, Finance and Economics Discussion Series 2020-049. Washington:

Benmelech, E., & Tzur-Ilan, N. (2020). The determinants of fiscal and monetary policies during the COVID-19 crisis, NBER Working Paper 27461.

Bounang, P., & Tchafack, T. (2020). Government and institution measures in response to COVID-19.

https://home.kpmg/xx/en/home/insights/2020/04/cameroon-government-and-institution-measures-in-response-to-covid.htm.

Caggiano, G., Castelnuovo, E., & Kima, R. (2020). The global effects of Covid-19-induced uncertainty, Economic Letters, 194, https://doi.org/10.1016/j.econlet.2020.109392.

Caggiano, G., Castelnuovo, E. (2019). Global Uncertainty. Monash University and University of Melbourne, Available at https://sites.google.com/site/efremcastelnuovo/.

Degiannakis, S., Filis, G., & Panagiotakopoulou, S. (2018). Oil Price Shocks and Uncertainty: How stable is their relationship over time.https://mpra.ub.uni-muenchen.de/96271/ MPRA Paper No. 96271, posted 08 Oct 2019 09:42 UTC.

Eichenbaum, M., Rebelo, S., & Trabandt, M. (2020). The macroeconomics of epidemics, NBER Working Paper 26882, Cambridge, MA: National Bureau of Economic Research.

Fornaro, L., & Wolf, M. (2020). Covid-19 Coronavirus and Macroeconomic Policy. Barcelona GSE Working Paper Series, No 1168, 1-10.

Faria-e-Castro, M. (2020). Fiscal policy during a pandemic, Federal Reserve Bank of St. Louis, Working Paper 2020-006E.

Fletcher, B. (2020). The economic impact of COVID-19 on sub-Saharan Africa.https://www.controlrisks.com/our-thinking/insights/the-economic-impact-of-covid-19-on-sub-saharan-africa.

Hendry, D., (1995). Econometrics and Business Cycle Empirics. The Economic Journal, 105(433),1622-36.

Gondwe, G. (2020). Assessing the Impact of COVID-19 on Africa's Economic Development, UNCTAD/ALDC/MISC/2020/3

González-Rivera, G. (2019). Vector Autoregression. Applied and social sciences magazines.

https://www.encyclopedia.com/social-sciences/applied-and-social-sciences-magazines/vector-autoregression#B.

Gudeta, D., Arero, B., & Goshu, A. (2017). Vector Autoregressive Modelling of Some Economic Growth Indicators of Ethiopia. American Journal of Economics, 7(1), 46-62.

Haleem, A., Javaid, M., & Vaishya, R. (2020), Effects of COVID 19 Pandemic in Daily Life.

Current Medicine Research and Practice, 10(3), 78-79.

International Air Transport Association [IATA]. (2020). Potential for revenue losses of $113bn due to COVID-19 "crisis". https://airlines.iata.org/news/potential-for-revenue-losses-of-113bn-due-to-COVID-19-%E2%80%9Ccrisis%E2%80%9D.

Kekere, I., & Isah, S. (2022). Does Exchange Rate Misalignment Respond to COVID-19 and Containment Measures in Nigeria? A publication of Central Bank of Nigeria, 46 (3), 12 -23.

International Monetary Fund (2021). Policy Response to COVID-19. Policy Tracker. https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19.

Ludvigson, C., Sai M., & Serena N. (2021). Uncertainty and Business Cycles: Exogenous Impulse or Endogenous Response? American Economic Journal: Macroeconomics, 13 (4): 369-410.

Katris, C. (2021). Vector Autoregression (VAR) Data Analysis. *Eng. Proc.* 2021, *5*(1), 41.

Kronborg. A. (2021). Estimating Foreign Shocks in a VAR Model. Working paper 7. Danish Research Institute for Research and Analysis. www.dreamgruppen.dk

Market Business Insider data bank. markets.businessinsider.com.

Matuka, A. (2020). COVID-19 Outbreak and US Economic Policy Uncertainty: An ARDL Approach. https://ssrn.com/abstract=3685346 or http://dx.doi.org/10.2139/ssrn.3685346

Morsy, H., Balma, L., & Mukasa, N. (2020), 'Not a Good Time': Economic Impact of COVID-19 in Africa, Working Paper Series N° 338, African Development Bank, Abidjan, Côte d'Ivoire.

Nonvide, G. (2020), Short-term impact of COVID-19 on poverty in Africa, Covid Economics: Vetted and Real-Time Papers, 15, CEPR Press, 7 May, pp. 184–92.

Olomola, J. (2020). Nigeria – COVID-19: Tax Relief and Fiscal Stimulus Plans.

https://home.kpmg/xx/en/home/insights/2020/04/flash-alert-2020-203.html

Oruonye, E., & Ahmed, A. (2020). Covid-19 and Challenges of Management of Infectious Medical Waste in Nigeria: A Case of

Taraba State. International Journal of Waste Resources, 3(381), 1-5.

Oyedele, T. (2020). Nigeria: Covid-19: Federal Government Of Nigeria Announces Fiscal Stimulus Measures. https://www.mondaq.com/nigeria/financing/922270/covid-19-federal-government-of-nigeria-announces-fiscal-stimulus-measures.

Ozili, P. (2020a). COVID-19 in Africa: socio-economic impact, policy response and opportunities. International Journal of Sociology and Social Policy. https://doi.org/10.1108/IJSSP-05-2020-0171

Ozili, P. (2020b). COVID-19 in Africa: socio-economic impact, policy response and opportunities. International Journal of Sociology and Social Policy, 99617. https://doi.org/10.1108/IJSSP-05-2020-0171.

Rajab, K., Kamalov, F., & Cherukuri, A. (2022). Forecasting COVID-19: Vector Autoregression-Based Model. Arabian Journal for Science and Engineering, 47, 6851–6860.

Ramelli, S., & Wagner, A. (2020), Feverish stock price reactions to covid-19, CEPR Discussion Paper No. DP14511. Available at SSRN, Available at: https://ssrn.com/abstract53560319.

Saeed, J., & Ridoy, N. (2020). Covid-19, oil price and UK economic policy uncertainty: evidence from the ARDL approach. *Quantitative Finance and Economics*, *4*(3), 503-514.

Shang, A., Galow, K., & Galow' G. (2021).' Regional Forecasting of COVID-19 Caseload by Non-parametric Regression: A VAR Epidemiological Model. *AIMS Public Health, 8*(1), 124–136.

Stock, J., & Watson, M. (2001). Vector Autoregressions. Journal of Economic Perspectives, 15(4), 101-115.

Sumner, A., Hoy, C., & Ortiz-Juarez, E. (2020). Estimates of the impact of COVID-19 on global poverty.

Ulrichs, M. (2018). Identification of Financial and Macroeconomic Shocks in a VAR Model of the Polish Economy. A stability Analysis. Economics and Business Review, 4(1), 29-43.

United Nations Transitional Authority in Cambodia (2022). The World Economic Situation After the Covid-19 Shock and Policy Challenges Ahead. https://unctad.org/meeting/world-economic-situation-after-covid-19-shock-and-policy-challenges-ahead.

Yilmazkuday, H. (2020). COVID-19 and welfare costs of reduced mobility, Available at SSRN: https://ssrn.com/abstract=3587168 or http://dx.doi.org/10.2139/ssrn.3587168.

World Bank (2020). COVID-19 to Plunge the Global Economy into Worst Recession since World War II.

https://www.worldbank.org/en/news/press release/2020/06/08/covid-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii.

Wang, Q., & Zhou, Y. (2021). A Vector Autoregression Prediction Model for COVID-19 Outbreak.arXiv:2102.04843v1 [stat.AP] 6 Feb 2021.

file:///C:/Users/hp/Downloads/A_Vector_Autoregression_Prediction_Model_for_COVID.pdf.

Zhang, Z., Wang, W., Li, X., Yang, B., Song, J., Zhao, X., Huang, B., Shi, W., Lu, R., Niu, P., Zhan, F., Ma, X., Wang, D., Xu, W., Wu, G., Gao, G., & Tan. W. (2020). China. Novel Coronavirus Investigating and Research Team. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020, 382(8), 727–733.