Impact of COVID-19 Pandemic and the Oil Price shock on Economic Policy Uncertainty in US and Russia

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Summary: The purpose of this paper is examine the impact of COVID-19 and Oil Price on economic policy uncertainty in US and Russia using monthly, Jan, 2019, to March, 2021 by using the panel-ARDL approach. The results show that Economic policy uncertainty is positively correlated with the COVID-19, this indicate that an increase in COVID-19 can enhance Economic policy uncertainty, Meaning that an increase in the new cases raises the uncertainty of economic policy in the US and Russia in the short-run and long-run. The results also show that the Economic policy uncertainty is negatively correlated with the oil prices.
Keywords: economic policy uncertainty; COVID-19; Oil Price; US and Russia Countries.
Jel Classification Codes : C23 ; D72 ; H71 ; O43

I- Introduction :

On March 11, 2020, the World Health Organization (WHO) officially declared the novel coronavirus (COVID-19) outbreak a global pandemic. The pandemic led to unprecedented policy responses—lockdowns, social distancing, and stimulus packages—across the globe.The uncertainty surrounding these policy responses is huge because policymakers and other economic agents are not certain whether the responses will be temporary or permanent, to what extent the interventions will influence investment and consumption activities, how long economies will take to recover, according to (Baker & Terry, 2020) provide evidence that current uncertainty levels are much higher than those during the 2008–2009 Great Recession, and are closer to the level of the Great Depression in the United States. They also claim that most of the current economic slowdown is a product of the extremely high uncertainty due to the COVID-19 outbreak.

In addition, a combination of a collapse in oil prices and the global pandemic has sent shockwaves through the oil markets, where the price volatility is continuously increasing. According to (IEA, 2020) projects that oil and gas revenues for a number of key producers will fall by between 50 to 85% in 2020, compared with 2019, Saudi Arabia starts an oil price war on March 09, 2020, and floods the market with oil. This shock spills over financial markets that crash during the same day (the Black Monday).

This has significantly complicated the decision ‑ making process for executives in all sectors, whether private, public, or non ‑ prof. To capture the essence of the current scenario and what it may lead to in the future, This study attempts to answer two research questions related to the COVID-19 Pandemic and the oil price shock and economic policy uncertainty in the context of in US and Russia: (a) can COVID-19 Pandemic and the oil price shock increase or decrease economic policy uncertainty? (b) is it possible to empirically verify the existence of the relationship between the COVID-19 Pandemic and the oil price shock and economic policy uncertainty in US and Russia?

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I.1. The hypotheses of the study:

The double blow of COVID-19 Pandemic and the oil price shock increases or decreases economic policy uncertainty in US and Russia.

I.2. The approach and objectives of the study:

This study examines the impact of COVID-19 Pandemic and oil Price on economic policy uncertainty in US and Russia for the period Jan, 2019, to March, 2021 This study used the PMG method proposed by Pesaran et al. (1999), for co-integration in order to test the long-run relationship between the variables subject of study.

The rest of the paper is organized as follows. Section 2 provides a brief review of the literature. Section 3 explains the model specification, data and methodology. Section 4 discusses the empirical results. Section 5 concludes the research paper.

I.3. Literature Review:

In recent times, the causal influence of COVID-19 Pandemic and the oil price shock on the economic policy uncertainty abounds in the literature. The ongoing COVID-19 crisis presents not only an international public health concern but also a global economic crisis. (Njindan Iyke, 2020) in their study found the pandemic has a positive and statistically significant impact on EPU in China and Korea. In another study, (Qian, 2020) employed the dynamic conditional correlation model with mixed data sampling regressions to investigate the impact of economic policy uncertainty (EPU) and the COVID-19 pandemic on the correlation between the crypto currency index CRIX and the world stock market portfolio, as well as the hedging properties of CRIX. The study shows that the high (low) level of EPU has a significantly positive (negative) effect on the optimal hedge ratio of CRIX, which increases significantly during the COVID-19 period. Moreover, most of the abnormal market relations exist in high levels of EPU or during the COVID-19 period, and the impact of global EPU is greater than that of EPU originating in the United States, Europe, Russia and China. According to (David & al, 2020) consider the relationship between economic uncertainty indicators and before and during the COVID-19 pandemic for the case of US and UK. The results have shown that all indicators show huge uncertainty jumps in reaction to the pandemic and its economic fallout. Indeed, most indicators reach their highest values on record. Another results peak amplitudes differ greatly – from a rise of around 100% (relative to January 2020) in two-year implied volatility on the S&P 500 and subjective uncertainty around year-ahead sales for UK firms to a 20-fold rise in forecaster disagreement about UK growth.

According to (Albulescu, 2020) stated that the new infection cases reported at global level, and the death ratio, have no significant effect on the US EPU, whereas the oil price negative dynamics leads to increased uncertainty. However, analyzing the situation outside China, we discover that both new case announcements and the COVID-19 associated death ratio have a positive influence on the US EPU. The study of (Arshian & al, 2020) was in agreement with (Scott & al, 2020) Arshian et al, found that the COVID-19 outbreak has a greater effect on the US geopolitical risk and economic uncertainty than on the US stock market. The study also found While oil markets may recover through OPEC+ negotiations, the COVID-19 uncertainty remains the main concern of US policymakers. (Dietrich & al, 2020) study was slightly tilted away from other studies on COVID-19 and economic uncertainty in the sense that the study utilized household expectations in the US, considering that the short-term impact of covid-19 is determined by the expectations of the people about the overall effect, found that reveal a high standard deviation in people's responses, indicating the uncertainty of the economic costs of covid-19

the studies of (Scott & al, 2020) analyzed economic uncertainty before and during the COVID-19 pandemic of US and UK and found that all indicators show huge uncertainty jumps in reaction to the pandemic and its economic fallout. Meanwhile, the peak amplitudes differ greatly – from a 35% rise for the model-based measure of US economic uncertainty (relative to January 2020) to a 20-fold rise in forecaster disagreement about UK growth and time paths also differ: Implied volatility rose rapidly from late February, peaked in mid-March, and fell back by late March as stock prices began to recover. According to (Dayong & al, 2020) using statistical analysis of the impact of the COVID-19 pandemic on stock market risk for Countries on the top 10 list of

confirmed cases have been selected (according to the data on 27 March, 2020) together with Japan, Korea and Singapore during the period from dated 29 Feb, 2020 to 27 March, 2020. The results have shown that the individual stock market reactions are clearly linked to the severity of the outbreak in each country. The great uncertainty of the pandemic and its associated economic losses has caused markets to become highly volatile and unpredictable. That means the COVID-19 had a significant impact on the financial markets from 29 Feb, 2020 to 27 March, 2020. Another results show that global financial market risks have increased substantially in response to the pandemic.

The COVID-19 pandemic is a source of systematic risk, therefore there is a need for further research on Economic Uncertainty of coronavirus spread. In this study, we specifically focus on the United States and Russia-economic Uncertainty for several reasons. First, the United States and Russia are a particularly interesting combination to study in the light of the extent of differences in the depth of the economics in the two countries and, perhaps more interestingly, across various measures. Second, the United States and Russia economy is facing two serious shocks: the spread of the novel COVID-19 pandemic and the recent oil price slump. The combination of these two problems will likely initiate a long-term economic downturn and drive the US and Russia economy into the next recession, where the COVID-19 pandemic outbreak continues its tremendous spread in the US causing unprecedented effects of the US and Russia stock markets volatility and the economic policy uncertainty. Where, and the US and Russia markets were one of the main sources of a spillover effect to other markets and regions. Third, these drastic predictions create a hazy future for economic policies in the US and Russia. Thus, in a general sense, the dynamics of the US and Russia's economic policy are uncertain regarding the covid-19 situation. Thus, by analysis of the impact of COVID-19 and oil shock on the US and Russia Economic Uncertainty, we can provide useful insights for the contagion and spillover effect studies in other countries and regions, contributing to this large and important research area.

II– Methods and Materials:

II.1. Literature Review:

This study attempt to measure the effect of COVID-19 on economic policy uncertainty in US and Russia for the period Jan, 2019, to March, 2021. Therefore we use the EPU index as the dependent variable in our study. We use Covid-19 daily new cases oil prices as independent variables. Definitions and sources for all variables can be found in Table 01 and Fig. 01 in the Appendix. this variable they are selected in accordance with the previous literature.

II.2. Method:

The Literature Review employed to explore the connection that exists between variables and COVID-19 pandemic is combination of theoretical and empirical. Accordingly, the model specification will be as follows:

$$EPU = f(Covid19, Oil\ Price)$$

To reduce the variation and induce stationary in the variance-covariance matrix, the natural logarithmic form (Ln) is applied to all the variables. The log linear (1) equation to examine the long run relationship between variables is given as follow:

$$\text{LnEPU} = \alpha_0 + \alpha_1 \text{LnCovid19} + \alpha_2 \text{LnOil Price} + \varepsilon_t \ldots..(2)$$

To estimate equation (2) in the long run impacts of COVID-19 on economic policy uncertainty are examined by applying the panel autoregressive distributed lag (ARDL) approach to co-integration. There are various reasons which make panel-ARDL model more useful than other techniques. Firstly, it can be applied irrespective of whether the series are I(0) or I(1). Also, panel-ARDL approach is more suitable and produces more valid results for small sample size. Also, The panel ARDL technique was selected to investigate the long-term and short-term co-integration correlations between the determinants and extract the ECM (error correction version) of the panel

characteristics to identify the short-term dynamic. Based on the study variables, the following model can be suggested (Pesaran & al, 1999) :

$$\Delta LnEPU_{it} = \emptyset_i(LnEPU_{i,i-1} - \theta' X_{-t}) + \sum_{j=1}^{p-1} \lambda_{ij}^{*} \Delta LnEPU_{i-J} + \sum_{j=0}^{q-1} \delta_{ij}^{*} \Delta LnCovid19_{\,i,-J} + \sum_{j=0}^{k-1} \psi_{ij}^{*} \Delta LnOilPrice_{i,-j} + \mu_i + \varepsilon_{it}$$

The parameter $\emptyset_i$ is the error-correcting speed of adjustment term. If $\emptyset_i = 0$, then there would be no evidence for a long-run relationship. This parameter is expected to significantly negative under the prior assumption that the variables show a return to a long-run equilibrium. Of particular importance is the vector θ' which contains the long-run relationships between the variables (Pesaran & al, 1999) .

III- Results and discussion :

III.1 Result of Descriptive Statistics:

Table 02 in the Appendix; Shows the descriptive statistics of the variables used in our study, the mean of Economic policy uncertainty (EPU) is a amounted to 2.462148 with the standard deviation 0.201219 over the period of Jan, 2019, to March, 2021, the Economic policy uncertainty (EPU) can achieve as high as 2.899621 or as low as 2.040153 throughout these 27 Month. The statistic of Skewness reveals that Economic policy uncertainty (EPU). is skewed to right while, COVID-19 Pandemic and the oil price has the left side skewness.

III.2 Result of Unit Root Test:

We start by applying the IPS, LLC, ADF, PP, panel unit root tests to each individual series, in order to conclude whether the series are stationary or not. Table 03 in the Appendix; shows the test of stationary result, from the table we see that Economic policy uncertainty (EPU) and COVID-19 Pandemic is stationary at level and variable oil price are non stationary at level but stationary at 1erdifference with 5% significance level. As all the variables are found to have the order of I(0) and I(1), we choose to employ Panel-ARDL test in order to determine the long-run co-integration between Economic policy uncertainty (EPU) and select variables for US and Russia. In this case, the long-term relationship between the research variables is examined by Pedroni and Kao Residual Co-integration Test (1999).

The second step was the estimation of a basic panel-ARDL model that explains Economic policy uncertainty (EPU) and its determinants. are achievable. The first step is to determine the optimal delay and ARDL pattern form. As seen in Fig. 02, Schwartz's lowest criterion is related to ARDL(1, 1, 1) Therefore, the optimal pattern is ARDL(1, 1, 1).

III.3 Results of co-integration test:

The second step of our empirical work involves investigating the long-run relationship between FDI COVID-19 Pandemic and the oil price shock, economic policy uncertainty, using the panel cointegration technique due to (Kao, 1999) and (Pedroni, 2004).

According to the (Pedroni P. , 1999) and (Pedroni, 2004)., the cross-sectional units have to be independent, otherwise their size properties would be misleading. Introduces seven panel cointegration statistics based on both homogeneity and heterogeneity assumptions. Assuming a panel of N countries T observations and regressors (X_m) the co integration test follows the equation :

$$y_{it} = \alpha_i + \lambda_{it} + \sum_{j=1}^{m} \beta_{j,it} x_{j,it} + \varepsilon_{it}$$

Where y_{it} and x_{it} are assumed to be integrated of oeder one in levels i, e I(1). The seven statistics can be divided into tow sets. The first one consists of four panel statistics (the panel variance-statistics, the panel ρ-statistics, the panel PP-statistics, the panel ADF-statistics). The second set consists of three group panel statistics (the group ρ-statistics, the group PP-statistics, the group ADF-statistics). Under the null hypothesis all seven tests indicate the absence of cointegration $H_0: \rho i = 0 \forall i$ whereas the alternative hypothesise is given by $H_0: \rho < 1 \forall i$; where ρ_i is the autoregressive term of the estimated residual under H_1.

In Table 04 indicates that the four panel statistics among the four statistics used of the within- dimension, discard the no co integration null hypothesis and approve the variables co integration. The null hypothesis is further discarded by two out of the three between-dimension staistics, namely the PP-statistic and the ADF-staistic, which further confirms the existence of co integration among variables. To conclude, six out of seven tests confirm the long-term variables co integration.

In addition, The (Kao, 1999) test follows the same approach as the Pedroni test but is based on the assumption of homogeneity across panels with

$$x_{it} = \alpha_i y_{it\beta} + \varepsilon_{it}$$

Where i=1……N; t = 1…..T; α_i = individual constant term, β = slope parameter and ω_i= stationary distribution ; X_{it} and Y_{it} are integrated processes of order I(1) for all i and (Kao, 1999) derives tow (DF and ADF) types of panel cointegration tests both tests can be calculated from :

$$\overline{\omega}_{it} = \rho \overline{\omega}_{it-1} + V_{it} \qquad \text{and} \qquad \overline{\omega}_{it} = \rho \overline{\omega}_{it-1} + \sum_{j=1}^{\rho} \theta_j \Delta \overline{\omega}_{it-j} + V_{it}$$

Where $\overline{\omega}_{it-1}$ is obtained from the equation (01), the null hypothesis is $H_0: \rho = 1$ no cointegration, while the alternative hypothesis is $H_1: \rho < 1$. According to Kao Residual co-integration Test (Kao, 1999), the hypothesis of zero non-cointegration is rejected and the existence of a long-term relationship between researches variables is confirmed (Table 05). In these case We reject the null hypothesis and accept the alternative hypothesis that there is a common integration between the variables of the study. These results allow us to estimate the error model of the Panel ardl (long-term equilibrium speed).

III. 4 Long and Short-Run estimates of Panel-ardl Approach:

In Table 06 in the Appendix; shows the long run coefficient of ardl model, from the we can see that the according to long run coefficients of Economic policy uncertainty (EPU) and COVID-19 Pandemic and the oil price, are statically significant in levels at 1%, 5%, 10%. On the other hand, the results show that Economic policy uncertainty is positively correlated with the COVID-19 Pandemic, this indicate that an increasing of 1 point COVID-19 score will increases the Economic policy uncertainty (0.185099) within a Month Meaning that an increase in the new cases raises the uncertainty of economic policy in the US and Russia. The results also show that economic policy uncertainty (EPU) is negatively correlated with oil prices. This result is consistent with the finding theoretical and empirical.

The short run results of Panel-ARDL method of estimation is displayed in Table 04. The findings displayed a valid short run relationship between Economic policy uncertainty (EPU) and its determinants in US and Russia. The coefficient of error term is displaying the value of around -0.958154 propose that around 95% of instability is adjusted in the present year. Results also error correction coefficient (ECTt-1), is negative and significant at 5%, the coefficient indicates the adjustment speed to restore equilibrium in the dynamic model, that is the effect of a shock will be corrected by 95% with a days. This result is consistent with the finding of empirical studies.

IV-Discussion of Results.

The purpose of this study is to investigate the Impact of COVID-19 Pandemic and the Oil Price shock on Economic Policy Uncertainty, using the cases of the US and Russia. Although the determinants of well-Economic Policy Uncertainty have been studied in the past, growing COVID-19 Pandemic may have inspired a new set of effects. The study is therefore different in determining the role of COVID-19 Pandemic in Economic Policy Uncertainty.

where, the COVID-19 outbreak caught everyone by surprise. The pandemic has been devastating, in terms of contagiousness and fatality, and brought economies to a halt. The pandemic led to unprecedented policy responses—lockdowns, social distancing, and stimulus packages in US and Russia where, the uncertainty surrounding these policy responses is huge because policymakers and other economic agents are not certain whether the responses will be temporary or permanent, to what extent the interventions will influence investment and consumption activities, how long economies will take to recover. this reveals that a high EPU is associated with adverse effects on households, corporations, and governments, which tend to delay many financial decisions under high uncertainty, which leads to lower consumption, fewer issuances of debt, fewer investments, and higher unemployment. The effects of political and regulatory uncertainty also extend to the commodity markets, such as the adverse effects on both oil and gasoline markets, and can potentially create adverse impacts on the crypto‐currency market and its potential growth. We demonstrate that governmental uncertainty also affects financial, housing, and equity markets; debt issuances; and the entire economy. This underscores the importance of considering EPU as a risk factor. The association with several components of the global economy reflects not only the EPU index's critical influence, but also the importance of risk management. Our results lead us to consider the gravity of economic policy uncertainty and call for innovation across different sectors to mitigate its adverse effects. In Fig. 1, 2 , we report the time paths of the US and Russia economic policy uncertainty as measured by EPU index, shows that the EPU indexes in the US and Russia experienced extreme upward swings during the COVID-19 pandemic.

This finding confirms the results of (Qian, 2020); (David & al, 2020); (Dayong & al, 2020); (Scott & al, 2020). where, they studies show that COVID-19 Pandemic has positive and significant relationship with the Economic policy uncertainty in the US and China.were, the higher the levels of COVID-19 Pandemic in these countries, the more developed the COVID-19 Pandemic.

In addition, the study has shown that oil prices are important for the economic uncertainty. where, oil prices has negative and significant relationship with Economic policy uncertainty. Where, a combination of a collapse in oil prices and the global pandemic has sent shockwaves through the oil markets, where the price volatility is continuously increasing and because of the disease’s potential for further business disruption, the oil industry is concerned. This leads to economic uncertainty, and uncertainty, of course, is bad for the economy, bad for consumer sentiment, and bad for business investment. While this kind of pandemic usually produces only a very short term economic impact, it can have some serious effects in particular areas of the economy. In Fig. 4 , we report the time paths of the economic Oil price developments and global oil supply and demand balance. where, current conditions in the oil market are due to a number of factors impacting both supply and demand; first, the demand side, containment measures and economic disruptions related to the COVID-19 outbreak have led to a slowdown in production and mobility worldwide, producing a significant drop in global demand for oil. second, On the supply side, arrangements that have historically allowed oil producing countries to respond collectively to drops in demand have so far not been sufficient to curb production, signaling the reduced traction of multinational solutions in recent years. Although prices have since recovered, it is unlikely that there will be the same buoyancy in prices as witnessed following the 2008 global economic recession. This, in turn, will lead to economic uncertainty in both US and Russia. This finding confirms the results of (IEA, 2020); (Albulescu, 2020).

V- Conclusion:

We attempt to measure the effect of COVID-19 and oil Price on economic policy uncertainty in US and Russia for the period Jan, 2019, to March, 2021 by employing Panel-ARDL and bounds test approach. The results show that:

- ✓ the literature indicating that the explained this pandemic (COVID-19) outbreak will cause a dual demand and supply shock simultaneously which can slow down the trade flows and can cause international supply chain distortions and the oil market is witnessing the exceptional negative demand and positive supply shocks;
- ✓ the variables are found to have the order of I(0) and I(1), we choose to employ Panel-ARDL bound test in order to determine the long-run cointegration;
- ✓ There existe a long run equilibrium relationship between the Economic policy uncertainty (EPU) and this determinats according to Pedroni and Kao Residual co-integration Test (1999, 2004);
- ✓ From the outcome of the study based on ARDL, COVID-19 (new cases) has a long-run influence on economic policy uncertainty in the US and Russia Furthermore, Brent oil prices have a negative and strong impact on the US an UK economic policy uncertainty in the equilibrium;
- ✓ Policy reactions to contain the virus and level the stock markets are needed; however, non-conventional policy interventions, such as the US and Russia unlimited QE, create further uncertainty and may cause long-term problems. As the result is also indicating a strong relationship between oil prices and economic policy uncertainty, the policymakers should be more cautious when conducting the macroeconomic policies in this pandemic time because the oil price shocks could destroy the effective outcomes of these policies;

General proposals and recommendations :

- ✓ The policymakers should be more cautious when conducting the economic policy uncertainty in this pandemic time because the COVID-19 Pandemic and the oil price shock could destroy the effective outcomes of these policies.
- ✓ This study will be new insights for other scholars who will show their interest in this economic policy uncertainty in future.

- Appendices:

Table (1) :: presents a schematic overview of the variables of this study

Variable	Description	Source
EPU economic policy uncertainty	(news-based index)	Website of Economic Policy Uncertainty
COVID-19	observations of COVID-19 (measured as a number of the infected cases of a novel COVID-19 in the US and UK)	Centers for Disease Control and Prevention (CDC)
Oil price	oil prices (measured as WTI benchmark crude oil prices)	Data Stream

Source : The World Bank Database, Global Entrepreneurship Monitor, 2021.

Table (2).: Descriptive Statistics

	EPU	OIL_PRICE	COVID19
Mean	2.462148	1.705018	5.198188
Median	2.481429	1.759439	5.251230
Maximum	2.899621	1.854306	6.122355
Minimum	2.040153	1.260071	3.504743
Std. Dev.	0.201219	0.128460	0.576335
Skewness	0.105530	-1.508377	-0.688539
Kurtosis	2.545266	5.179538	4.095338

The source :Eviews 09 output

Table (3) : Panel Unit Root Tests

	FDI	CPI	IT
LLC	I(0)	I(1)	I(1)
IPS	I(0)	I(1)	I(1)
ADF-fisher	I(0)	I(1)	I(1)
PP-fisher	I(0)	I(1)	I(1)

Notes: Probabilities for the Fisher-type tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. The choice of lag levels for the Breitung, IPS and Fisher-ADF test are determined by empirical realisations of the Schwarz Information Criterion. The LLC and Fisher PP tests were computed using the Bartlett kernel with automatic bandwidth. Automatic lag length selection based on Schwarz Information Criteria (SIC):5. Δ denotes the first difference.

The source :Eviews 09 output

Table (4) : .Results of Pedroni cointegration test

Pedroni Residual Cointegration Test
Series: EPU OIL_PRICE COVID19

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-4.242615	0.0042	-4.313803	0.0068
Panel rho-Statistic	-4.523713	0.0002	-3.811198	0.0086
Panel PP-Statistic	-3.708058	0.0438	-4.261562	0.0119
Panel ADF-Statistic	-4.043697	0.0026	-4.011979	0.0052

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	-0.269427	0.3938
Group PP-Statistic	-2.478451	0.0066
Group ADF-Statistic	-3.477388	0.0000

The source :Eviews 09 output

Table (5):.Results of KAO cointegration test

Kao Residual Cointegration Test

Series: EPU OIL_PRICE COVID19

	t-Statistic	Prob.
ADF	-4.870753	0.0000
Residual variance	0.018757	
HAC variance	0.011949	

The source :Eviews 09 output

Table (6): ARDL(1, 1, 1).

Dependent Variable: D(EPU)
Method: ARDL

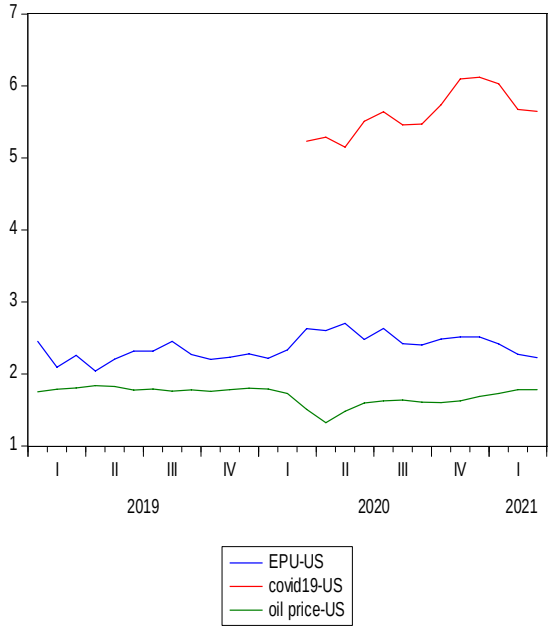
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Long Run Equation				
OIL_PRICE	-1.296029	0.176668	-7.335957	0.0000
COVID19	0.185099	0.063761	2.902997	0.0104
Short Run Equation				
COINTEQ01	-0.958154	0.223143	-4.293911	0.0006
D(OIL_PRICE)	-0.682204	0.326181	-2.091493	0.0528
D(COVID19)	0.107148	0.037041	2.892681	0.0106
C	3.495739	0.659596	5.299820	0.0001

Mean dependent var	-0.029750	S.D. dependent var	0.137165
S.E. of regression	0.102252	Akaike info criterion	-1.424471
Sum squared resid	0.167288	Schwarz criterion	-0.940587
Log likelihood	28.51812	Hannan-Quinn criter.	-1.285130

*Note: p-values and any subsequent tests do not account for model selection.

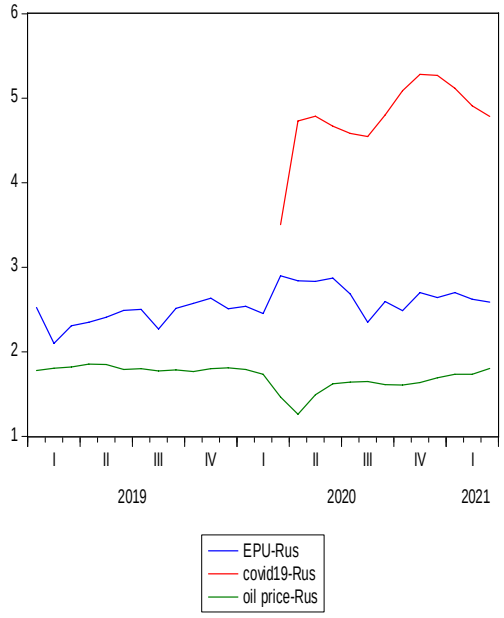
The source :Eviews 09 output

Figure (1): **The variables of this study in US**



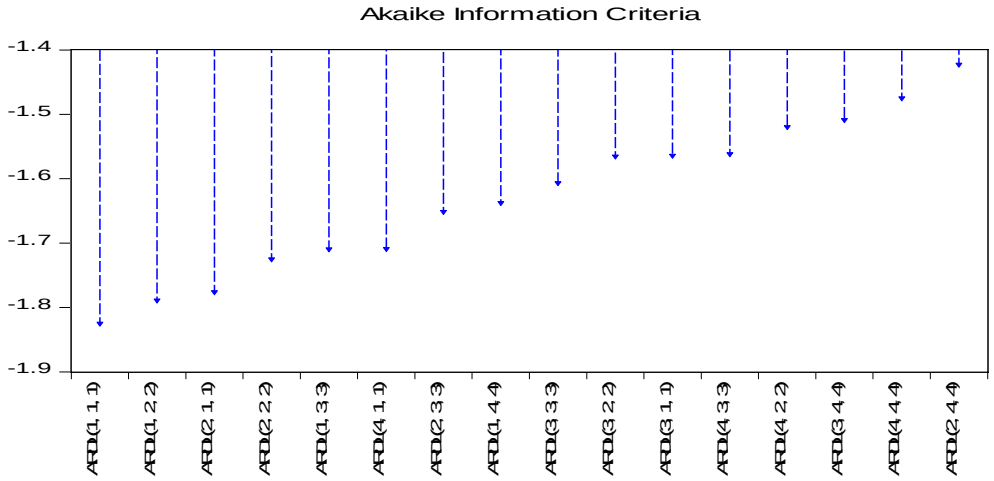
The source :Eviews 09 output

Figure (2): **The variables of this study in RUS**



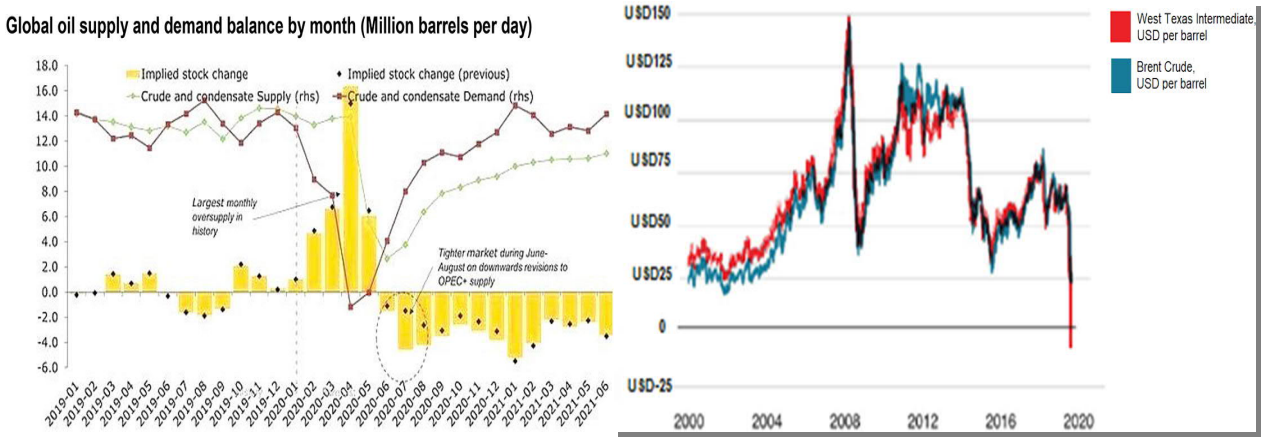
The source :Eviews 09 output

Figure (3) :**Selection optimal model ARDL according to Schwarz criterion**



The source :Eviews 09 output

Figure (4) :Oil price developments and global oil supply and demand balance



Source :
-https://www.oecd.org/coronavirus/policy-responses/the-impact-of-coronavirus-covid-19-and-the-global-oil-price-shock-on-the-fiscal-position-of-oil-exporting-developing-countries-8bafbd95/

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