The Impact of COVID-19 Pandemic on the Economic Security of Russia and European Countries

Bartosz Kozicki[1] Marcin Górnikiewicz[2] Marzena Walkowiak[3]

Abstract:

Purpose: The study investigates the impact of the COVID-19 pandemic on Russia and European countries' economic security.

Design/Methodology/Approach: The research began with a multifaceted analysis of oil prices before and after the COVID-19 pandemic declaration. It then examined oil demand and air passenger volumes in European countries to impact world oil prices.

Findings: The article deals with issues related to oil prices, passenger air transport, multivariate analyzes, and economic security.

Practical Implications: Categorized line and bar charts and indicators of dynamics on a fixed base were applied to analyze economic security better. This article focuses on European countries, while the core matter of oil prices is its demand and the number of passengers transported by air in European countries.

Originality: The lack of analyzes in the literature related to the impact of the COVID-19 pandemic in Russia and European countries' economic security.

Keywords: Crude oil prices, passenger air transport, multivariate analyzes, economic security.

JEL: C51, E31, E37, E64.

Paper Type: Research in Security Studies.

---

[1]Military University of Technology, Warsaw, Poland, e-mail: bartosz.kozicki@wat.edu.pl;
[2]Military University of Technology, Warsaw, Poland,
e-mail: marcin.gornikiewicz@wat.edu.pl;
[3]Military University of Technology, Warsaw, Poland,
e-mail: marzena.walkowiak@wat.edu.pl;

1. Introduction and Literature Review

During the outbreak of the COVID-19 pandemic, it was particularly important for countries around the world to maintain economic security in order to further economic development and provide a sense of certainty and a guaranty that they seek solutions to overcome the spreading infectious disease (Redo, Wójtowicz, and Ciak, 2018; Khan *et al.,* 2020; Grima *et al.,* 2020). The first diagnosed case of COVID-19 was revealed in Wuhan, China, in December 2019 (Zhu, Zhang, Wang, Li, Yang, and Song, 2020). A Novel Coronavirus from Patients with Pneumonia in China, 2019, New England Journal of Medicine. The disease spread very quickly, and in the following weeks, it was diagnosed in other countries such as South Korea, Japan, Taiwan, and Thailand. The largest outbreak of COVID-19 in Europe was observed in Italy in early 2020 (Medonet, 2020).

On March 11, 2020, the infectious disease COVID-19 has declared a pandemic (Satomi *et al.,* 2020). The pandemic's appearance showed that in many countries, the health care system was not prepared for such a situation (Matuka, 2020). Microsoft co-founder Bill Gates has described COVID-19 as a "once-in-a-century pathogen we have been worried about" (CNBC, 2020). The spread of COVID-19 resulted in the closure of borders, suspension of air traffic, and increased border controls (IOM, 2020; Manurung, 2020).

The situation caused a slowdown in world economies, anxiety, and long-term changes in the markets, which manifested in the fall in natural resources prices, such as oil or natural gas (Luisetto, Fiazza, and Latiyshev, 2020). The drop in oil prices was triggered by the spread of infectious disease COVID-19 in most European countries, South America, and China. This, in turn, led to the fact that the main world importers of crude oil, such as China or European countries, reduced the demand for this raw material (Kingsly and Kouam, 2020).

Undoubtedly, low oil prices have affected the income of countries such as Russia, Saudi Arabia, and others, whose main source of budget funds is the sale of this raw material. The study attempts to investigate the impact of COVID-19 on the economic security of Russia and European countries. The first stage of the research will be to conduct a multidimensional analysis of oil prices.

2. Multidimensional Analysis of Oil Price

The research began with drawing a line chart (Figure 1) of the data on crude oil prices in dollars per barrel daily from January 4, 2010, to October 5, 2020.

Figure 1. *Line chart of raw oil price data in US dollars per barrel from 4 January 2010 to 5 October 2020*
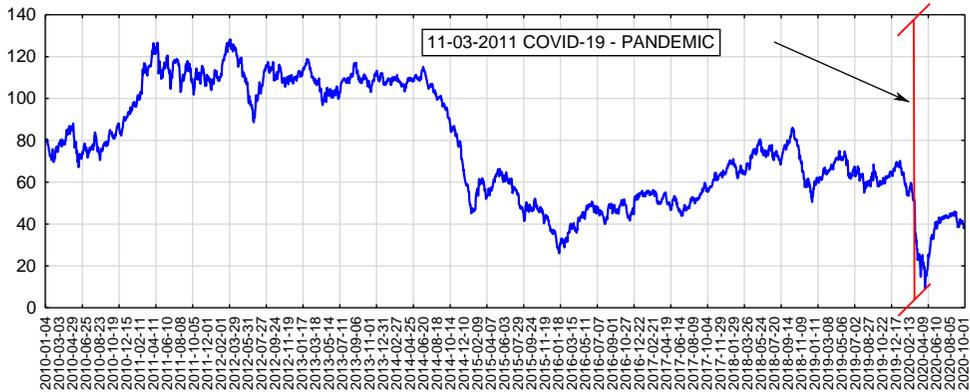
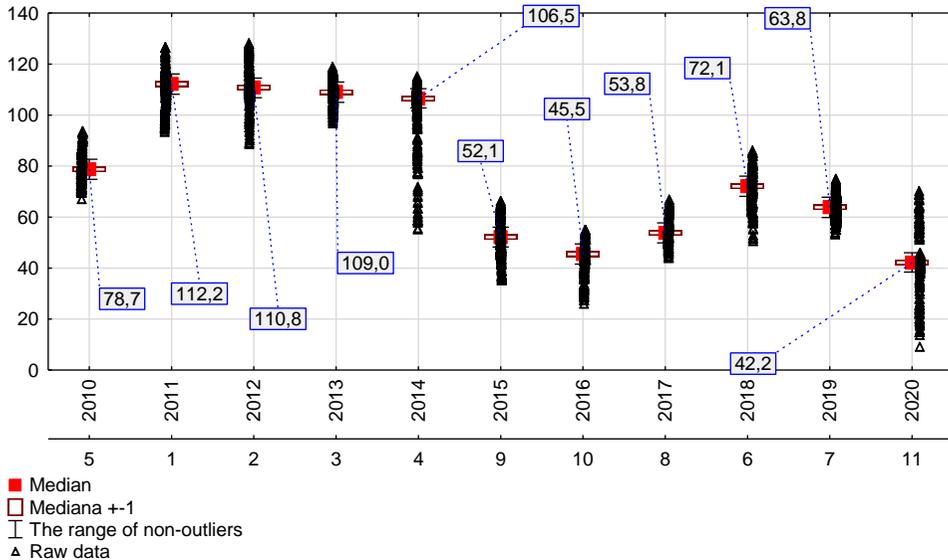*Source: Own study based on data obtained from the website: https://www.eia.gov/ [as of 5 October 2020]*

Figure 1 shows that crude oil prices in dollars per barrel ranged from $ 9 to about $ 130 from January 4, 2010, to October 5, 2020. Crude oil prices fell sharply at the start of the COVID-19 pandemic (March 11, 2020). On March 5, 2020, the price per barrel was USD 51.29, and on April 21, 2020, it dropped to USD 9.12 per barrel. Then oil prices per barrel increase to around $ 40.

For research purposes, it was decided to examine prices in individual years 2010–2020, calculating their medians and outlining the recorded primary data (crude oil prices in dollars for 1 barrel) - Figure 2.

The data presented in Figure 2 shows that the highest median of prices in dollars per barrel of crude oil in 2010-2019 was visible in 2011 and amounted to 112.2. The second place in the ranking of the highest median prices in dollars per barrel of crude oil was 2012 with a score of 110.8, and the third was 2013, where the median was 109. The lowest in the ranking is 2020, where the median was 42.2 USD per barrel of crude oil. The years 2014 and 2020 are characterized by the longest oil price ranges in dollar terms.

For illustrative purposes, it was decided to conduct a comparative analysis of prices per barrel of crude oil in the same months in 2010-2019, with the year 2020. The results of the research are presented in Figure 3. The data observation in Figure 3 shows that at the time of the COVID-19 pandemic, the price of a barrel of crude oil in US dollars was approximately half of the same month's arithmetic mean of the same month 2010-2019. The lowest arithmetic mean of prices per barrel of crude oil in dollars was recorded in April 2020 and amounted to 18.4. May 2020 was second in the ranking with a result of $ 29.4 per barrel. March 2020 is third in the ranking with a result of $ 32 a barrel.

Figure 2. *Categorized chart box – whiskers of the primary data on crude oil prices in dollars per barrel from 4 January 2010 to 5 October 2020 (X2 axis ranking*
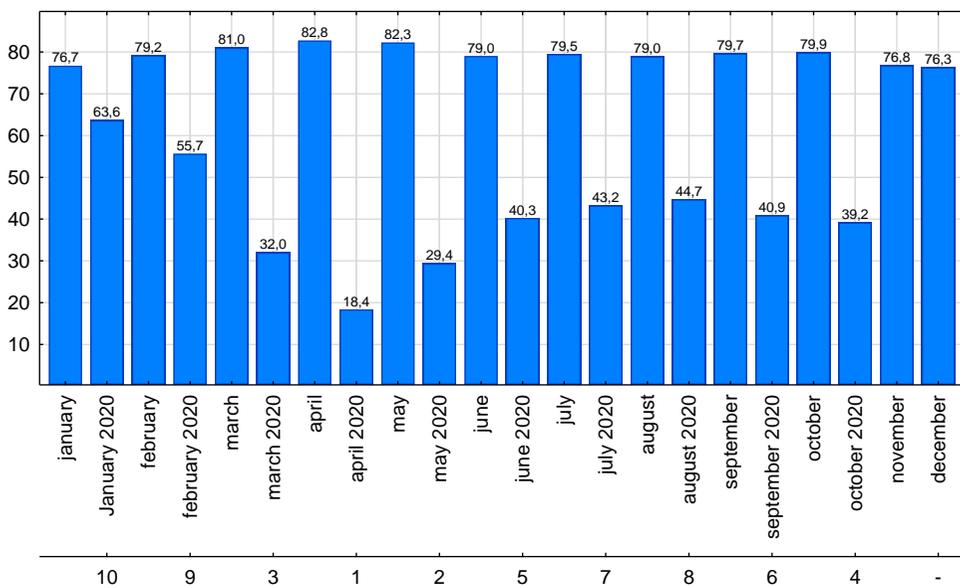

Source*: Own study based on data obtained from the website: https://www.eia.gov/ [as of 5 October 2020].*

During the COVID-19 pandemic (March 11 to October 5, 2020), the arithmetic mean of crude oil prices in dollars is 35.41, while the median is 40.32. The standard deviation from the average is $ 9.77 a barrel. For illustrative purposes, Figure 4 presents the total financial expenditure incurred on oil extraction in selected countries of the world for 1 barrel in dollars.

The data presented in Figure 4 shows that the highest financial expenditure on the extraction of 1 barrel of crude oil in dollars is Venezuela and amounts to $ 63. The US is in second place, where the production of 1 barrel of crude oil on land requires USD 49. Kazakhstan is third with $ 44 for the extraction of 1 barrel of crude oil. The fourth and fifth places in the ranking belong to Russia, where the extraction of 1 barrel of crude oil at sea is $ 44 of a financial outlay, while on land, it is $ 42. The lowest ranking is for Saudi Arabia, where the production of 1 barrel of crude oil is $ 17.

Figures 1 to 4 show that from March to October 2020, in countries where crude oil is sold, except for Saudi Arabia, it is not very profitable, even does not allow for income. This is due to the high financial outlays related to mining (Fig. 4) concerning the prices in force on the market since the outbreak of the COVID-19 pandemic until now.

Figure 3. *Categorized bar chart of raw oil price data in dollars per barrel from 04/01/2010 to 31/12/2019 with data from 02/01 to 05/10/2020 on a monthly basis (labels on the X scale with the same names of months include arithmetic mean of crude oil prices for identical months from 04/01/2010 to 31/12/2019, while the labels marked with the month of the year 2020 include the arithmetic mean of crude oil prices of the identical months from 02/01 to 05/10/2020 2020 (X2 axis - ranking of arithmetic mean of crude oil prices in dollars per barrel in 2020 on a monthly basis from the lowest to the highest value)*

Source: *Own study based on data obtained from the website: https://www.eia.gov/ [as of 5 October 2020].*

Low prices on the market for 1 barrel of crude oil in dollars during the COVID-19 pandemic were caused by a decline in global demand for this raw material. The next substantive point was devoted to the multidimensional analysis of oil demand in European countries.

3. Multidimensional Analysis of Crude Oil Demand

For research purposes, a comparative analysis of crude oil demand in European countries was carried out every month from January 2019 to July 2020. For this purpose, dynamics indicators with a constant basis (January 2019) were calculated and summarized in Figure 5.

Figure 5 shows that, since the COVID-19 pandemic outbreak, there has been a decline in demand for crude oil in the analyzed European countries. The phenomenon is visible from April to July 2020. In July, we see a slight increase in the demand for crude oil, caused by the holiday season and the opening of air

traffic. The highest increase in the dynamics index on a fixed basis was observed in July 2020 in Romania to 166.48.

***Figure 4**. Categorized bar chart of the total financial outlays incurred on crude oil extraction in selected countries of the world for 1 barrel in dollars*
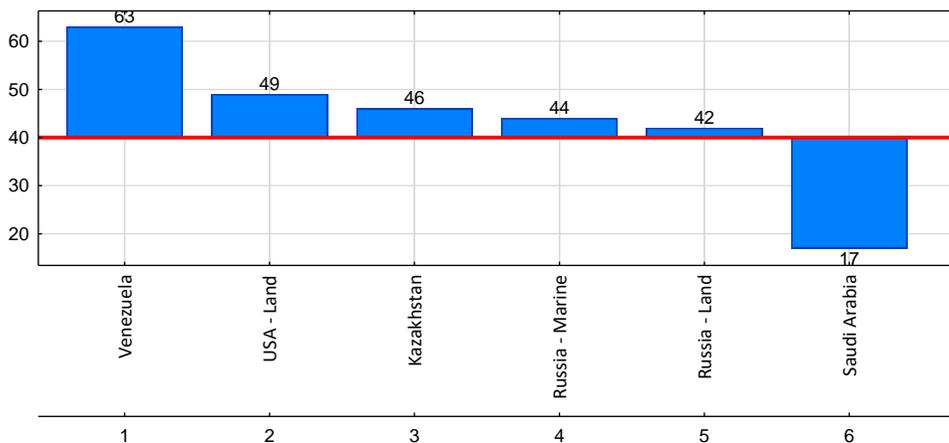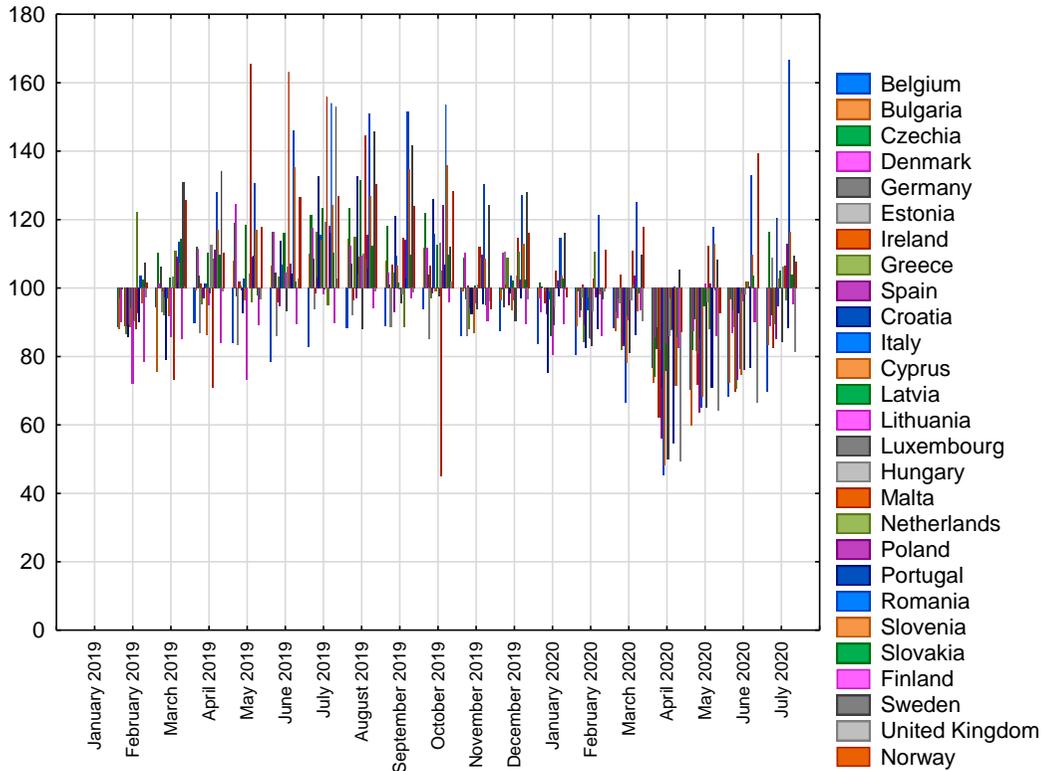

Source: Own study based on data obtained from the website: https://www.energetyka24.com/rosyjska-ropa-jedna-z-najdrozszych-na-swiecie [as of October 9, 2020]

A comparative analysis and ranking (Figure 6) of the difference in the sum of crude oil demands from January to July between 2020 and 2019 in the analyzed European countries in thousands of tons were performed.

The analysis carried out in Figure 6 shows that in 23 European countries out of the 27 studied, there was a decline in the demand for crude oil from January to July between 2020 and 2019.

The highest difference in crude oil demand from January to July between 2020 and 2019 was observed in the United Kingdom and amounted to - 8,592,000 tonnes. Italy is in second place, where the difference was - 8,249 thousand tonnes. Spain takes third place in the ranking with the result - 7 566 thousand tonnes. On the other hand, Germany is in fourth place with a result - 6,236 thousand tonnes. Belgium is next with the result - 2 354 thousand tonnes. Each of the 18 European countries had a negative difference of fewer than 2,000 thousand tonnes. Slight increases were observed in four European countries: Estonia (20,000 tonnes), Romania (23,000 tonnes), Lithuania (24,000 tonnes), and Finland (49,000 tonnes). A multidimensional analysis of the number of passengers transported by airlines in European countries was carried out in the next substantive point.

Figure 5. *Categorized bar chart of dynamics indexes with a fixed base (January 2019) for crude oil demand from January 2019 to July 2020 in European countries*

4. Multidimensional Analysis of the Number of Air Passengers

The reduced demand for crude oil was due to the number of passengers transported by airlines, caused by the suspension of air services due to the COVID-19 pandemic. This became the basis for delineating people transported by air transport in the same month (March) between 2020 and 2019 in 30 European countries and ranking the obtained results.

The observation of the data presented in Figure 7 allows us to conclude that in all 30 analyzed European countries, the difference between the number of passengers transported in the same month (March) between 2020 and 2019 was negative. The lowest value was recorded in Great Britain and amounted to –11,305,427 passengers. Germany is second with a score of -10,749,931. The next places in the ranking are taken by: Italy (-9,837,275), Spain (-9,598,432), France (-7,529,074),

the Netherlands (-3514,371), Switzerland (- 2 923 035), Portugal (-2 057 877). The rest of the countries showed a difference of fewer than 2,000,000 passengers. In total, in the 30 analyzed European countries, fewer people were transported in March 2020 than in March 2019: 76 002 405 passengers.

Figure 6. *Bar ranking graph of the difference in the sum of crude oil demand from January to July between 2020 and 2019 in the analyzed European countries in thousands of tonnes*
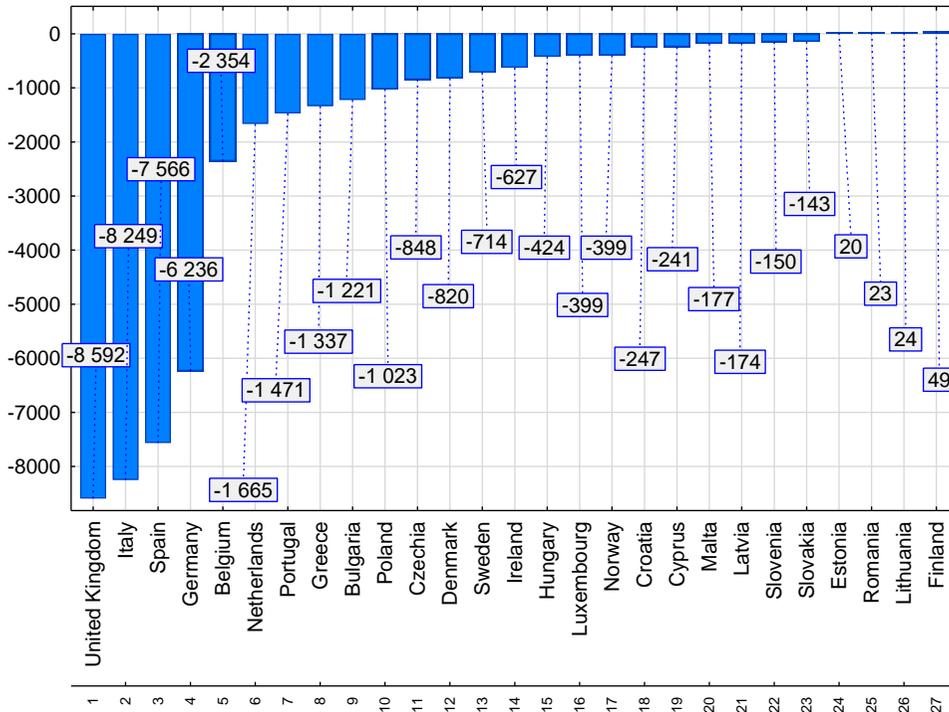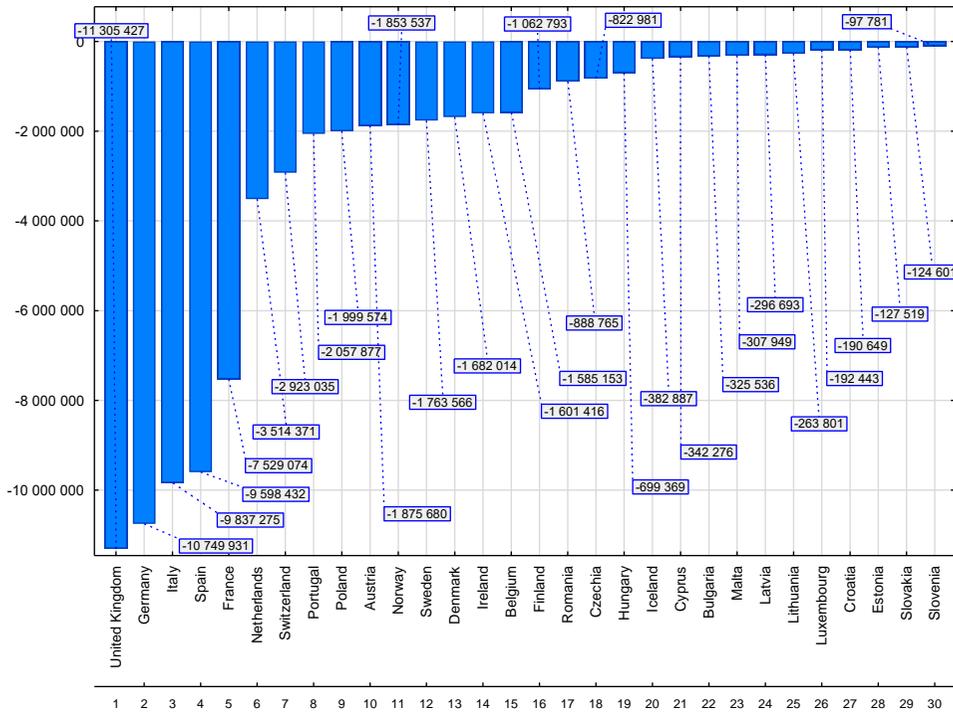

Source: *Own study based on data obtained from the website: https://ec.europa.eu/ [as of 5 October 2020].*

The analysis carried out with the method of cultural foresight depicted societies with the highest abilities to manage their own resources, which were assigned values from 0 (low self-organization abilities), 0/1 (relative self-organization abilities), 1 (high self-organization abilities). To assign a value from 0 to 1 in determining the culturally conditioned ability to manage the societies' own resources, the following values of cultural codes were taken into account: HU - HU / LU; CO - IN / CO; ST; HN; LT; CM. The adopted values resulted from analogies to societies with a high level of self-organization, and the researchers used the results of security studies to determine the above-mentioned values.[4]

---

[4] *See: Górnikiewicz M. Cultural foresight of threats to national and international security, ed. MUT, Warsaw 2018. HU - High Understanding, LU - Low Understanding; CP -*

Figure 7. *Ranking of the difference of people transported by air transport in the same month (March) between 2020 and 2019 in 30 European countries*

Source: *own study based on data obtained from the website: https://ec.europa.eu/ [as of 5 October 2020]*

United Kingdom	0	Finland	0/1
German	0/1	Romania	1
Italy	0/1	Czechia	0/1
France	0/1	Hungary	0
Netherlands	0/1	Iceland	0
Switzerland	0/1	Bulgaria	1
Portugal	1	Malta	0/1
Poland	0/1	Latvia	0/1
Austria	0/1	Lithuania	1
Norway	0/1	Luxembourg	0/1
Sweden	0	Croatia	1
Denmark	0	Estonia	0/1
Ireland	0	Slovakia	0/1
Belgium	1	Slovenia	1

Cooperation, IN - Independence, CM - Competition, ST - Stabilization, HL - High Uncertainty, Low Uncertainty - LN, LT - Long-term, ST - Short-term, SL - Selectivity. CM – Comprehensiveness.

The above study showed that societies from such countries as Portugal, Belgium, Romania, Bulgaria, Lithuania, Croatia, Slovenia reveal the highest ability to optimally manage their own resources (including the period of low availability of these resources in the COVID-19 period), which suggests that the economy of these societies will continue to function properly despite the reduced economic state compared to that before the outbreak. Similarly, residents of countries such as the United Kingdom, Sweden, Denmark, Ireland, Hungary, and Iceland will be most affected by the epidemic's economic impacts. The societies of other countries will feel the results of the epidemic only to a certain extent. However, despite the noticeable decline in the economic state, this particular situation should not significantly devastate these societies' economies enough to have far-reaching effects on average citizens. At the same time, considering the level of wealth of the inhabitants of the United Kingdom, Sweden, Denmark, and Ireland, it can therefore be assumed that the citizens of these countries will be most severely affected by the economic impacts of COVID-19, and the economic position of these countries will significantly weaken against the societies that manage their won resource much better, even those, whose societies will be particularly fiercely experienced by the epidemic.

4. Summary and Conclusions

The outbreak of the COVID-19 pandemic has led to a decline in oil prices around the world. From March 5, 2020, to April 21, 2020, the price dropped to $ 9.12 per barrel. The research shows that at the time of the COVID-19 pandemic, the price of a barrel of crude oil in US dollars was approximately half of the arithmetic mean of the same months in 2010-2019. The lowest arithmetic mean of prices per barrel of crude oil in dollars was recorded in April 2020 and amounted to $ 18.4. From March to October 2020, in countries where crude oil is sold, except for Saudi Arabia, it is not very profitable or makes it impossible to profit. This is due to the high financial outlays related to mining (Fig. 4) concerning the prices in force on the market since the outbreak of the COVID-19 pandemic until now.

Russia is one of the examples of countries that are loss-making as a result of the COVID-19 pandemic. The total financial expenditure on the extraction of crude oil at sea is $ 44 per barrel, and on land - $ 42 per barrel, with the average price oscillating from February 2020 around $ 40 for 1 barrel of crude oil. The prevailing pandemic may lead to irreversible changes in the Russian economy caused by a lack of financial resources, resulting from low world oil prices.

Since the COVID-19 pandemic outbreak, the demand for crude oil has declined in the analyzed European countries. This phenomenon is visible from April to July 2020 (Fig. 5).

In 23 European countries, out of the 27 considered, crude oil demand declined from January to July between 2020 and 2019. The highest difference in crude oil

demand in the months from January to July between 2020 and 2019 was observed in Great Britain and amounted to -8592,000 tonnes. Italy is in second place, where the difference was -8249 tonnes. Spain takes third place in the ranking with a result of –7566 tonnes.

In all 30 analyzed European countries, the difference between the number of passengers transported in the same month (March) between 2020 and 2019 was negative. The lowest value was recorded in Great Britain and amounted to -11,305,427 passengers. Germany is in second place with a result - 10,749,931. The next place in the ranking is for Italy, with the result of z9,837,275 passengers. Large drops in the number of people transported by air translate into a slowdown and weakening of the economy's individual sectors. The longer-term COVID-19 pandemic in Europe could bankrupt shipping and other companies, lead to unemployment and trigger a global financial crisis.

After the analysis with the applied method of cultural foresight, it can be assumed that among the studied societies, some of them will ensure optimal functionality of their own economy. Simultaneously, the other part may experience a shock ending in strong turbulence or a complete economic decline, depending on the epidemic's duration. This, in turn, allows us to identify those societies that will benefit economically from the epidemic compared to others: Portugal, Belgium, Romania, Bulgaria, Lithuania, Croatia, Slovenia.

References:

CNBC. 2020. Bill Gates: Coronavirus may be 'once-in-a-century pathogen we've been worried about'. https://www.cnbc.com/2020/02/28/bill-gates-says-coronavirus-may-be-once-in-a-century-pathogen.html.

Forbes. 2020. Retrieved October 12, 2020. https://www.forbes.pl/gospodarka/koronawirus-zamkniecie-granic-od-15-marca-zamkniecie-galerii-handlowych-i-restauracji/n5nl3g1.

Górnikiewicz, M. 2018. Prognozowanie kulturowe zagrożeń bezpieczeństwa narodowego i międzynarodowego - Cultural foresight of threats to national and international security, ed. MUT, Warsaw.

Grima, S., Dalli Gonzi, R., Thalassinos, I.E. 2020. The Impact of COVID-19 on Malta and its Economy and Sustainable Strategies. Available at SSRN: https://ssrn.com/abstract=3644833 or http://dx.doi.org/10.2139/ssrn.3644833.

Khan, S., Rabbani, R.M., Thalassinos, I.E., Atif, M. 2020. Corona Virus Pandemic Paving Ways to Next Generation of Learning and Teaching: Futuristic Cloud Based Educational Model. Available at SSRN: https://ssrn.com/abstract=3669832.

Kingsley, K., Kouam, H. 2020. COVID-19 and oil prices, SSRN Electronic Journal.

Luisetto, M., Fiazza, C., Latiyshev, O.Y. 2020. COVID-19 Pandemia and the Management Strategy for Business and Economy # COVID-19 #Coronavirus #Management #Economy #Emergency #Infectious Disease #Virologist, Management and Business Administration IMA Academy Lab.

Manurung, H. 2020. Russia - ASEAN relations during COVID-19 pandemic. https://www.researchgate.net/publication/342499986.

Matuka, A. September 2020. COVID-19 Outbreak and US Economic Policy Uncertainty: An ARDL Approach. SSRN Electronic Journal, https://www.researchgate.net/publication/344083397.

Redo, M., Wójtowicz, K., Ciak, J.M. 2018. Bezpieczeństwo finansów publicznych - Security of public finances. CeDeWu, Warsaw.

Reliefweb.int . 2020. Retrieved October 12, 2020, from: https://reliefweb.int/sites/reliefweb.int/files/resources/DTM%20%28COVID-19%29%20-%20Global%20mobility%20restriction%20overview%20-%2019%20March%2C%20202020.pdf.

Satomi, E. et al. 2020. Alocação justa de recuros de saúde escassos diante da pandemia de COVID-19 Considerações éticas. Einstein SÃ £ o Paulo, 18(2), 1-5, DOI: 10.31744 / einstein_journal / 2020AE5775.

Wazna, M. 2020. Retrieved October 12, 2020, from: https://www.medonet.pl/koronawirus/koronawirus-na-swiecie,jak-rozprzestrzenial-sie-koronawirus-covid-19-sars-cov-2-na-swiecie-,film,70030550.html.

Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song J. et al. 2020. A Novel Coronavirus from Patients with Pneumonia in China. New England Journal of Medicine.