Study the Impacts of Covid-19 Pandemic on Oil Market in Iran and the Globe

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Abstract

The Covid-19 pandemic has well illustrated the extent to which the health crisis can negatively affect the economic activities of oil-exporting countries. Empirical evidence confirms that global oil prices and global demand for this commodity are the two key channels of the disease's impact on the economies of such countries. Given the high importance of this issue, this study examines the effects of this disease on US oil demand (as an indicator of world oil demand) and the West Texas price index (as an indicator of world oil prices), based on weekly data from June 14, 2019 to May 15, 2020. For this purpose, an autoregressive distributed lag model (ARDL) was used and, thus, the impact of Covid-19 on oil demand and the oil price index both in the short- and the long erm was studied. According to the findings of this study, Covid-19 had a negative and significant effect both in the long run and in the short run on the global oil price index and global oil demand. Also, with regard to the results of the causality test based on the VECM model, a strong long-term causality from the global oil price index to the Iranian oil price was confirmed. Therefore, it can be argued that Covid-19 has a strong negative impact on Iran's crude oil price index through affecting global crude oil price in the long run. Therefore, in order to avoid budget deficits and hyperinflation in Iran, oil-independent budget should be seriously considered by policy makers.

Keywords: Covid-19, Crude Oil Price, Oil Demand, ARDL Model, Causality Test.

JEL: C12, C22, Q31, Q43, I15.

1. Introduction

The global economic shock of the Covid-19 is a clear indication that the health crisis could have serious implications for economic activity. According to the International Monetary Fund (2020), the global economy is projected to shrink by 3% this year, which is even worse than the global economy during the 2008-2009 financial crisis. In the meantime, one of the key sectors that has been affected is the oil sector. In fact, following the deterioration of the global economic outlook and disputes of the oil exporting countries, oil exports and its

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products have reduced from mid-January to the end of March 2020; oil prices fell by 65% and natural gas prices by 38%. Also, according to the future markets, the price of oil will remain below $ 45 per barrel until 2023, which is 25% below its average price in 2019, and this indicates continued low demand for it. In addition, US oil inventories are rising and storing has decreased as West Texas Intermediate (US market oil) crude oil prices have fallen by $75 (Platts, July, 2020).

The world's major oil producers sought to stabilize the oil market as well as control stocks by announcing an agreement to cut oil production by 9.7 million barrels in early April 2020. However, this decrease in supply cannot compensate for the increase in US stocks to 518.6 million barrels, and this was not enough to compensate for the fall in demand, and if the upward trend in storage continues, storage tanks will be completed and storage costs of oil will increase and oil prices will fall. The US crude oil future prices also fell to a negative level for the first time in history as the contracts expired. In June 2020, about 160 million barrels of crude oil were stored in oil tankers, which was quite unprecedented, causing the largest monthly crude oil price difference in history.

In fact, given the importance of this issue, especially in the Iranian economy, in this study we seek to answer this key question: what are the channels through which the Covid-19 shock, affects the global oil price index and oil demand in the globe? Therefore, in this study, the impact of Covid-19 on US oil demand (as an indicator of world oil demand) and the West Texas Intermediate price index (as an indicator of world oil prices) was studied based on weekly data from June 14, 2019 to May 15, 2020. For this purpose, the ARDL model was used. In addition, to investigate the relationship between the global oil price index and the Iranian crude oil price index, the causality test based on the VECM model was used. In fact, in this way, the impact of Covid-19 on Iran's crude oil price index can be studied.

2. Theoretical Framework
In this section, a brief description of the channels of impact of Covid-19 disease on the global oil market is given.
2-1. Demand:
One of the key variables affecting the global oil market is related to the demand for this commodity. According to EIA[1] report (2020), despite the sharp decline in crude oil prices, global oil demand in April 2020 fell by about 29 million barrels per day, which was unprecedented in the last 25 years. Based on this report, the demand for petroleum products in our region will drop by 2.9 percent, jet fuel consumption will decrease about 15 percent and gasoline consumption will decrease about 6 percent in this year. Also, the demand for these products is expected to decrease by an average of 1.6 million barrels per day in 2020.

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1. International Energy Agency

2-2. Financial Markets:

Financial markets have also been deteriorating since mid-February, 2019, following growing concerns about the expansion of Covid-19 and its economic consequences. Based on the evidence obtained in recent months, it can be argued that the downward trend in oil prices has had a significant effect on the decline in the global financial market index. In fact, in the stock market, most of stocks are selling fast at low prices, and as this risky situation worsens, central banks are going to lower interest rates and try to increase their liquidity.

2-3. Crude Oil Stocks:

Crude oil stocks are another key variable affecting the oil market that has been severely affected by this epidemic. According to available statistics, US crude oil storage capacity has grown by about 60 percent and US Cushing reservoirs have completed about 75 percent of their capacity. This has made space for oil storage very difficult and impossible. In fact, sellers' inability to find storage space has pushed the US crude oil price index for delivery in May 2020 to the negative range in the Nymex market. In addition, rising demand for floating storage has boosted shipping rates for US crude oil tankers (Platts, July, 2020).

3. Method

The following two models were considered to examine how Covid-19 affects US oil demand (as an indicator of world oil demand) and the effect of this variable on the West Texas Intermediate price index:

$$LWTI_t = \alpha_t + \beta_1 LWTIF3_t + \beta_2 LUSOID_t + \beta_3 LSTOCKOIL_t + \beta_4 LSP_t + \tag{1}$$
$$\beta_5 CORONA_t + U_t$$

$$LUSOILD_t = \alpha_t + \beta_1 LSTOCKOIL_t + \beta_2 LSP_t + \beta_3 CORONA + U_t \tag{2}$$

> **LWTI**: West Texas intermediate index
> **LWTIF3**: Oil futures west Texas intermediate (3 months)
> **LSTOCKLOIL**: US oil stocks
> **LUSOILD**: US oil demand
> **LSP**: S&P 500 index

CORONA: dummy variable that is equal to 0 in the time period that it does not exist and equal to 1 for the period that it exists.

It should be noted that all the variables are in a logarithmic format. In order to estimate the above two equations, the ARDL model was used. Also, to investigate how the price of Iranian crude oil is affected by the Covid-19 epidemic, the causal relationship between the global crude oil price index and Iran's crude oil price was investigated using the causality test based on vector error correction model.

4. Results

Before estimating the models, Dickey-Fuller stationarity test was applied to evaluate the stationarity of the variables. Based on the results, all variables were I (0) and I (1) and, therefore, the application of ARDL technique was unobstructed. The results of estimating equation (1) indicate that in the short run, LWTI has a significant and negative effect, LWTIF3, up to four intervals, has a positive and significant effect, and finally, the variables LSP, LSTOCKOIL and LUSOILD have a negative and significant effect on independent variable. The CORONA variable also has a significant negative effect on LWTI. Based on the results of estimating Model (1) in the long run, LSTOCKOIL and LUSOILD have a negative and significant effect. In contrast, LSP and LWTIF3 have a positive and significant effect on the oil price index. The CORONA variable also has a significant negative effect on the West Texas Intermediate oil price index.

The results of estimation for equation (2) also indicate that in the short run, LSTOCKOIL has a negative and significant effect on US oil demand in its level, LSP index in the short run doesn't have a significant effect on US oil demand up to the first lag, but for SP (-2), a positive and significant effect was observed. The CORONA variable also has a significant negative effect on oil demand in the short term. In the long run, our findings show a positive and significant effect for LSTOCKOIL and LSP on LUSOILD, but in contrast, CORONA has a negative and significant effect on LUSOILD in the long run.

Furthermore, to show the effect of Covid-19 on Iranian oil prices, the causal relationship between LIROIL and WTI crude oil prices was examined. The results confirmed the existence of a strong long-term causality from WTI index to LIROIL.

5. Conclusion

According to the findings of this study, Covid-19 has had a significant negative impact on both short-term and long-term oil demand and oil price index. Based on the results of causality test, the existence of a strong long-term causality was confirmed from the global oil price index to the Iranian oil price. Therefore, based on these results, it can be argued that the decline in Iran's oil exports to its trading partners will continue significantly due to falling oil prices and following the decline in global demand for oil and political conflicts in oil-exporting countries. Finally, it can be stated that, considering the negative effects of the spread of the corona virus in international oil markets, which has occurred mainly due to the serious drop in crude oil prices index in different regions, the risk coverage of oil price fluctuations is very important. Since the prices of petroleum products, gas and petrochemical products are also subject to oil prices, the risk coverage of oil price fluctuations in international stock markets by creating risk management groups in this area (corona) or many other cases is essential.

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