Investigating the Effect of Quality Value Index and Market Time Structure on the Price Formula of Iranian Crude Oil in the Asian Market

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Abstract

The Asian oil market is one of the largest markets in the world, with the largest oil customers such as China, India, etc. located in this region. Therefore, examining the country's crude oil price formula in the Asian market in terms of technical issues of the oil market such as quality value indicators and oil market structure, in addition to price relations with crude oil market indices, is very important in explaining the country's crude oil price formula in the Asian market. Oil competitors have been trying to gain more market share in Asia in recent years by changing the price formula for crude oil. For this purpose, in this article, using the monthly data of the time series from 2013 until 2019 and multivariate GARCH method, the formula of Iranian crude oil price in the Asian market is examined based on the technical and economic parameters of the market. The results of this study show that the price of Iranian crude oil in the Asian market is a function of the quality value of Iranian crude oil compared to competitors, the degree of cantango or backwardness of the crude oil market and fluctuations in the average oil prices of Dubai and Oman. Also, the TAPIS index crude oil indirectly affects the country's oil price by affecting the Oman and Dubai crude oil markets.

Keyword: Market Structure, TAPIS Crude Oil, Qualitative Value Index and Price Formula.

JEL Classification: G1, O16, P18.

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1. Introduction

The Asian market is one of the most important markets in the world due to the population growth in this region and consequently the favorable outlook for oil demand in this market, and the oil producing countries are also competing with each other for a greater share. One of the important components in gaining more shares in the Asian market due to the competition of oil exporters in this market is the price of crude oil offered. Therefore, reviewing the formula based on each of the index crude oil can be effective in attracting customers and thus in oil revenues. the importance of this issue in the fact that the high dependence of the country's economy on oil revenues has increased the vulnerability of the country's economy and has caused severe disruptions in the country's current development programs. Understanding the mechanism of oil price formation can reduce the risk of oil price fluctuations and its negative effects on the Iranian economy. The Asian market is one of the most important crude oil markets in the world and the largest consumers in the world such as China, India, Japan and South Korea, which are the second, third, fourth and fifth largest consumers of crude oil in this market, respectively. Population growth, the rise of the middle class, and the rapid pace of urbanization will increase Asia's demand for consumer goods, packaging materials, and building materials that are increasingly made of plastic. During the sales embargo period in the previous period in 2012, the Asian market was still active as one of the target markets for the country's oil exports. The main producers and exporters of crude oil have always been in close competition to gain more market share and outperform other exporters. Crude oil price is one of the most important strategies of oil companies in increasing market share. In this regard, the world's state-owned companies are constantly changing their pricing system and oil price formula in accordance with market conditions and in order to gain market share. Due to the great importance of the Asian market, this article seeks to examine the factors such as quality value index and market structure index on the formula of Iranian crude oil prices in this region. This study seeks to answer the questions of whether the oil quality value index has a significant impact on the formula of Iranian oil prices in the Asian market? Also, does the market structure (cantango or backward) have a significant effect on the formula of Iranian oil price in the mentioned market? And finally, what is the appropriate model to explain the refinement of Iran's crude oil price formula in the Asian market?.

2. Theoretical Framework

The use of index crude oil to determine the oil price formula was very strong from 1974 to 1985, due to the support of OPEC producers, especially Saudi Arabia, for the announced prices of crude oil based on index (reference) crude oil. This was despite the fact that the sharp drop in crude oil prices in the 1980s and the reluctance of Saudi Arabia to use its crude oil as an indicator crude oil for other OPEC producers to use in their price formulas led to the introduction of an index the quality value of oil. Based on the calculation of the price of crude oil, this index was related to several specific parameters, including the gross value of the extracted product, refining costs and the time value resulting from the harvest period to the delivery of crude oil (Kameli, 2012). In the current oil pricing system, which is based on pricing or offering a formal pricing formula based on crude oil (reference), low-volume crude oil markets such as West Texas Intermediate, Brent and Dubai-Oman go to much higher production markets such as producers. It connects the Persian Gulf or other parts of the world, and through this, the oil price of these large producers depends on the price of index crude oil (with low production). Despite the high volume of production in the Persian Gulf, these markets have a low trading volume because the number of oil contracts is limited and there is no forward market or exchange contract or future cash market for them except the Dubai Stock Exchange. It has also created constraints that have hampered the oil and oil chain chains of these large producers, and in addition, these markets have continued to lack diversification (Pirung, 1996). The theory of market time structure considers the market structure as an important factor in oil price fluctuations and the crude oil price formula. The time structure of prices refers to the relative prices of a commodity that can be delivered at different times. For example, the price of Brent delivered in April compared to the price of Brent delivered in May. The difference between the two prices is the basis of price difference transactions. According to the theory of production coordination, production has more flexibility compared to consumption. For this reason, it is the producers who are futuristic in trading futures contracts (Mabro, 1998).

3. Method

The variables used in the model on a monthly basis from 2013 to 2019 are presented in Table (1). In this research, the official formula of Iranian crude oil price in the Asian market is evaluated by considering the indicators of time structure and quality value index;

$$\log(IC) = c_1+c_2 \log(ME) + c_3 (W) + c_4 (CAD) +e_t \quad (۱)$$

$$\log(DU) = c_5+ c_6 \log(BD) + c_7 CAD+ c_8\log(T)+e_t$$

$$\log(OM)= c_9+ c_{10}\log(BD) + c_{11}\log(T) + c_{12} (CADOD)+et$$

$$\sigma t2(i) = M(i) + A (i)et-12+ B (i) \sigma_{t-1}$$

The time structure index of the spot price difference between the prices of Dubai oil futures is calculated and the quality value index, as mentioned in the theoretical foundations, is the total value of products from refining Iranian oil. The variables used in this paper are:

Table (1) Introduction of variables

Variables	
BD	Brent Dated Crude oil price
IC	Iranian crude oil prices in the Asian market
DU	Dubai crude oil prices
W	The quality index of Iranian crude oil
Om	Oman crude oil prices
Me	Average prices of crude oil from Dubai and Oman
CAD	Dubai Oil Market Structure Index (Cantango)
CAOD	Oman oil market structure index compared to Dubai (Cantango)
T	Tapis crude oil prices (Asian light market index crude oil)

In this section, to determine the significance of the variables, the unit root test is checked through Eviews9 software and monthly data from 2013 to the end of 2019.

4. Results

All coefficients of model variables are statistically significant. If the average price of crude oil in Dubai and Oman increases by one percent, the price of Iranian crude oil in the Asian market will increase by about 1.2 percent. According to the theoretical framework, with the growth of the market time structure index (the amount of cantango oil market - Dubai crude) due to the increase in excess oil supply, demand for this crude oil will increase because in this situation oil prices are

currently less than The price is in the future, so it is economical for buyers to buy oil and store it and consume it in the future, and therefore the price of Dubai crude oil will increase, followed by the strengthening of Iranian crude oil prices. . According to the model model, the quality value index has a significant and positive sign, which indicates that if the quality value index of Iranian crude oil is higher than competitors' crude oil, customers will have more demand than Iranian crude oil and as a result its price will increase compared to competitors. Finds. In general, the proposed model can be efficient to determine the price of Iranian crude oil in the Asian market and take into account the price formula based on the technical issues of the market, significant quality indicators (comparison to competitors, especially Saudi Arabia) and the time structure of the market. Can be modified. According to market theories, Dubai crude oil has a movement with European market index crude oil and is a function of Brent crude oil, which according to the equation for one percent increase in Brent crude oil price explains about 1.05% of Dubai crude oil price changes. Also, as expected, with the increase in the amount of cantango in the Dubai oil market, the demand for this crude oil will increase due to consumers' preference to buy oil at a low price and store it for the future, and as a result, its price will increase. On the other hand, Tapis crude oil (Malaysia) as one of the leading crude oil (light and sweet) in the Asian market is inversely related to the price of Dubai, Oman and Oman crude oil, no matter how much the price of Tapis crude oil increases. Because the sour and medium crude oil market is different from the sweet and light crude oil market in terms of demand, because the crude oil of Dubai, Oman and Iran are classified as Tapis crude oil (light and sweet) as sour and medium crude oil. The demand for sour crude oil is adjusted and their prices are reduced compared to this Tapis crude oil. Therefore, based on the estimates, the research questions on the significance of the quality value index and market structure on the price formula are confirmed, and regarding the appropriate formula of Iranian oil price in the Asian market, the above model is proposed, which consists of index oil, crude oil and other Effective parameters (mentioned indicators) are to be used.

5. Conclusion

Market structure index (cantango or backward market), index of quality value of Iranian crude oil in comparison with competitors' oil, crude oil index of this region are the most important components that are insignificant in determining the formula of Iranian oil price in this market. Also, with the change in the price of crude oil

from Dubai and Oman, turbulence will be transferred to the Iranian oil market in the Asian market. The results of the present study show that its price in this region, in addition to being a function of the average crude oil of Oman and Dubai index, is also a function of quality value index and market time structure that the weight of these indicators is not considered in price calculations. Another result of the present study is that the price of crude oil in the Asian market index (TAPIS) does not directly affect the price of Iranian crude oil in the Asian market, but affects the price of Iranian crude oil by affecting the price of crude oil in Oman and Dubai. Price time structure index is an important component that affects all oil markets and has been considered by producers in the oil price formula. It is suggested that in the formula of Iranian crude oil price in this market, the amount of cantango or backwardness of Dubai oil market should be used according to the estimates of the research model. It is also recommended that the variable of the quality value of Iranian crude oil relative to Saudi crude oil be determined in determining the price of Iranian crude oil in the Asian market. On the other hand, according to the research findings, to determine the official price of crude oil, first by analyzing the market and Dubai oil price based on oil price changes, the European market index (Brent) and then market fluctuations, Oman crude oil was used to determine the oil price formula.

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