

# ***ACTUAL OR NUMERICAL? A DISCUSSION ON CRUDE OIL PRICES AND EXPORTS***

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## **Overview**

Energy prices is an important factor affecting the global economy. With the acceleration of China's industrialization and urbanization, energy prices have a greater impact on China's price level and economic development. Ren (2012) thought that on the one hand, China's demand of energy and the import dependence was growing, China had become the world's second largest energy producer and consumer; on the other hand, the international energy prices affected by the subprime mortgage crisis and the subsequent fluctuations was large. After joining WTO, China's foreign trade developed rapidly, the scale of trade continued to expand. The volume of exports rose from 249 billion to 2275 billion during from 2000 to 2015, increased by 10 times. From 2009, China's export trade was become the world's first by overtaking Germany.

Shao (2012) considered that in the context of huge energy consumption and a high degree of dependence on foreign, whether the high or wide shock of energy prices, will have an impact on China's trade structure. International crude oil prices had large fluctuations in recent years. The international crude oil prices had been keeping stable about 16 years from 1986, it was about \$10~30 a barrel after the third oil crisis. Since then it went through two big ups and downs, it had jumped to an all-time record about \$150 a barrel in 2008. It is widely believed that China's economic growth drove the demand and prices of crude oil. Nearly two years, the prices of international crude oil fluctuated between \$30-60 a barrel because of the supply exceeds the demand. According to historical data, it is found that there is a positive correlation between China's export trade and international crude oil price in 1977-2010, but it has changed since 2011. International crude oil prices have begun to decline, while China's export trade is on the rise. This was not consistent with historical experience(Figure 1). Some scholars believe that this is due to China's labor surplus, but we find the same phenomenon occurred in some oil trading countries and regions, such as Europe, the United States, Canada, Mexico, etc(Figure 2-4). So, what we want to talk about is that exports and oil prices is really relevant or just numerically related.

In this article we will use linear and nonlinear Granger causality test to do the preliminary judgment of the relationship between oil prices and exports. We choose the Middle East, Mexico and Canada as oil exporting countries, the United States, Japan, Europe and China as oil importing countries. They were respectively discussed, and we tried to find the real link between exports and international crude oil prices from a global standpoint.

## **Methods**

Granger Causality test and Dynamic Factor Model.

## **Results**

From the F statistics, we know that ①the export volume of all countries is not the cause of Granger's oil price, and the price of oil is not the export volume of the reasons for the trade of the Granger.② At the 0.1 level of significance, the volume of export trade in all countries is the cause of the nonlinear Granger. ③under the 0.1 level of significance, the oil price is the nonlinear Granger cause of export trade volume, and the nonlinear causality is established in all countries.

Through the Dynamic Factor Model, we get 2 export trade factors, factor 1 is export trade factor. there is a strong positive marginal effect between oil price and export. The coefficient of factor 2 was found to be not significant, and the coefficient of factor 1 was significantly positive. The marginal effect of oil price and oil-exporting countries' export trade is 0.676, The developed countries is 0.671. Among them, the marginal effect of China's export trade and oil price is 0.597, and the marginal effect between the developed countries and the oil price is 0.699. On the whole, the impact of oil prices on export and import countries are basically equal. In importing countries, the marginal effect of oil price on developed countries is greater, and there is little effect on china.

## Conclusions

First of all, this paper examines the correlation between crude oil prices and exports of major economies. The results show that: 1. There is a strong correlation between crude oil prices and the exports of major economies in the world; 2. There is a stronger correlation between crude oil prices and oil exporting countries, in which, the correlation coefficient in the Middle East is 0.835; 3. The correlation between crude oil prices and oil importing countries is related to the stage of economic development, developed countries are more closely related to oil prices.

And then, the Granger causality test is used to test the oil price and the export of major economies. The results show that: 1. The export volume of all countries is not Granger's reason for oil prices, and oil prices are not Granger's reason for export volume. 2. At a significant level of 0.1, the volume of export trade in all countries is the nonlinear Granger cause of oil prices, the change of export volume of one country will cause the change of international crude oil price, and this kind of influence relation is non-linear. 3. Third, at a significant level of 0.1, oil price is a nonlinear Granger cause of export trade, and the nonlinear causality is established in all countries. But in the short term, Japan does not show the relationship, that is, in the short term, Japan's export volume is not affected by changes in oil prices.

At last, model the Exports of major economies and crude oil prices by Dynamic Factor Model(DFM). The results show that: For the oil exporting countries like Middle East, Mexico and Canada, the rising crude oil prices will lead to a decline in exports, the falling crude oil prices will rise the exports. For oil importing developed countries like the United States, Japan and Europe, the rising crude oil prices will lead to a decline in exports, but the falling oil prices will not lead to a significant rise in exports. For oil importing developing countries like China, the rising oil prices will lead to an increase in exports in the short term. If the oil prices continue to rise, exports of China will also be reduced, when oil prices fall, exports will increase significantly in the short term. In general, the fluctuation of crude oil price has a linear relationship with the export of oil exporting countries. However, the relationship between oil importing countries is relatively complicated. This paper argues the main reason for this phenomenon is that, for oil importing countries, fluctuations in oil prices have little impact on the country's production costs, and the changes in costs lags behind the crude oil prices.

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