Visualizing the World Crude Oil Price

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(1) Overview

Rather than the description of past story shown in most visualization charts (Isma'il, 2012), this paper tries to use the visualization skill to project the crude oil price in the near future. EIA provides the crude oil price forecasting figures in its short-term energy outlook every month based on the liquid fuel balance chart which also indicates the quarterly liquid fuel demand and supply in past years and next year (EIA, 2018). Although this demand and supply scheme can generally project oil price movement well, it ignores the fact of quick response production characteristic of large shale oil supply in North America recently. Many small shale oil producers produce more oil very quickly once the crude oil price increases to a higher level, while close their oil wells also quickly as the price drops down. Without capturing the relative share of this shale oil production, the projection of the crude oil price in the near future may be biased.

The purpose of this paper is to capture the evolution of world crude oil production and demand by applying the dynamic visualization techniques. We will draw several kinds of dynamic visualization slideshows to capture the movement of different oil production, demand, export, import etc. of different countries in the world. Our preliminary results show that these dynamic visualization slideshows can enhance the projection of the crude oil price in the near future.

(2) Methods

After reviewing all related articles, we tackle this issue step by step as below:

1. Collect oil production, demand, export, import etc. for all countries from JODI data bank.
2. Collect WTI and BRENT spot price from EIA.
3. Draw dynamic visualization bar and world map slideshows for oil production, demand, export, import etc. respectively for top 30 countries from January 2002 to September 2018.
4. Separate the shale oil production and non-shale oil production by using different color.
5. Combine above slideshows with the corresponding WTI and BRENT price trends to judge the most probably price movement in the near future. For example, WTI price will drop much quicker if past crude oil production increment mainly comes from the shale oil.
6. Build up the relationship among dynamic visualization bar charts and WTI/Brent prices.
7. Conclude and make some suggestions.

(3)Results

Using monthly data from January, 2002 to September, 2018 for all above data, our preliminary dynamic visualization results show us some new view for better capturing the world crude oil market movement such as the top two crude oil export countries are more dominated the world export market for many years, which indicating the cooperation of Saudi and Russia will better control the world oil price. By the way, recent rapid oil production increase in US may indicating the world oil market will quickly move to the demand and supply rebalance in the middle year of 2019 since shale production

can be adjusted quicker.

(4)Conclusions

Visualization skill is more popular today with the help of ICT and big data.　　This paper using the dynamic visualization technique to draw some interesting slideshow based on the rich data from JODI data bank.　　Our preliminary results show that these dynamic visualization slideshow can enhance the projection of the crude oil price in the near future.　　Recently, less crude oil import change in the top 30 countries, rapid export increase from Saudi Arabia, and significant shale production from US implied that the world oil market can be rebalanced quickly than most experts had expected.

Major References

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Figure 1: Dynamic visualization slideshow for oil export for top 30 countries from January 2002 to September 2018