

THE ROLE OF FUNDAMENTS, INVENTORIES AND OPEC OBJECTIVES IN OIL PRICE FLUCTUATION—BASED ON SVAR MODEL

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Abstract

What are the main reasons leading to the decline in the price of oil and what is the difference between the current oil price fluctuations and 2008? In this article, we develop a structural VAR model to study the short term factors of oil price. The results show that the speculation, OECD inventory and OPEC spare capacity are short-term factors, and speculation is the main cause that affects the price of oil compared with the other factors. In the medium term, supply and demand still play a dominant role. Since June 2014, the oil price has given up about 55% of its value, falling to \$44.74/b in January 2015 as global oil markets continued to be oversupplied and demand had yet to pick up. Different from the oil price fluctuations in 2008, speculation has played an import role in the process of falling oil price in the second half of 2014. For the volatility in oil price, the Chinese government and enterprises should develop appropriate policies to reduce the negative impact of oil price fluctuations on the domestic refined oil pricing reform and oil investment decisions.

Introduction

According to the study findings present above, the explanation for short-term fluctuations in oil price can be divided into two factions. One group (Kilian et al) believe that supply and demand are the main reasons for the volatility of oil price, and the other scholars believes that crude oil price fluctuations cannot be completely explained by supply and demand, short-term factors, such as inventory, OPEC spare capacity and speculation will also have an impact on oil price. The aim of this study is an attempt to answer the above arguments and research the short-term factors of oil price fluctuations. For this purpose, the structural VAR model is used to examine the impact of different factors on the price of oil.

Methods

SVAR model

Results

In order to answer this question, we examine the reactions of crude oil price to supply shock, aggregate demand shock, precautionary demand shock and speculative demand shock. Figs.1 illustrate the impulse response of oil price to structural one standard deviation innovation in other variables. The red dashed lines correspond to plus or minus two standard errors around the impulse responses.

According to Fig.1a that a one time positive shock to supply shocks had an negative effect on oil price which lasted four month. This is consistent with Kilian (2014), who suggested that the impact of supply shocks will not affect the current oil price, but there is a lag. Fig 1b shows that one standard deviation aggregate demand shock had an positive effect on oil price and the shocks are statistically significant. In the short term, the biggest impact is speculative pressure, which had an positive impact on oil price. The impact of OPEC spare capacity and OECD inventory shocks on oil price are negative, while the impact of spare capacity shocks are shorter.

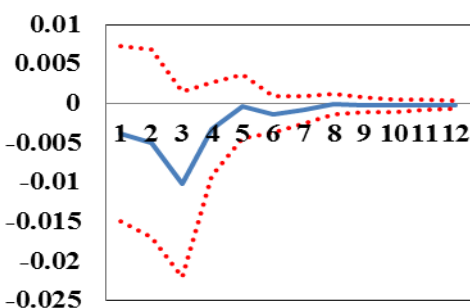


Fig 1a Response of dlnp to supply shock

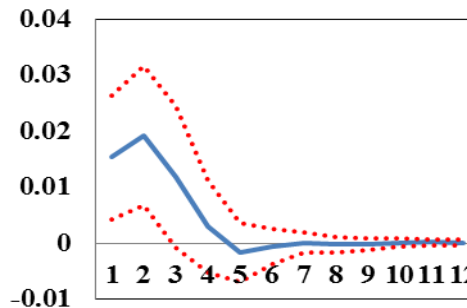


Fig 1b Response of dlnp to aggregate demand shock

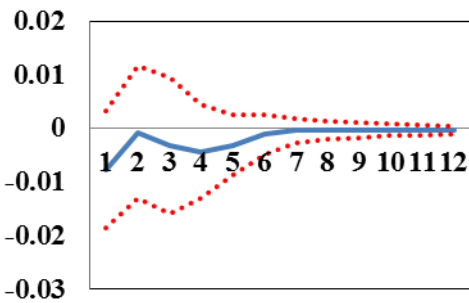


Fig 1c Response of dlnp to spare capacity shock

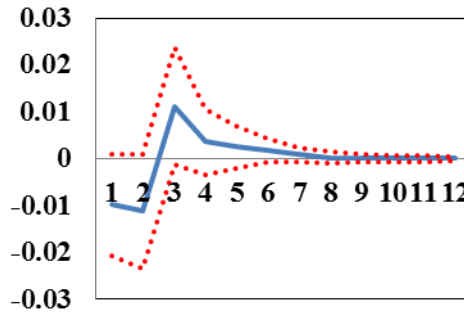


Fig 1d Response of dlnp to OECD inventory shock

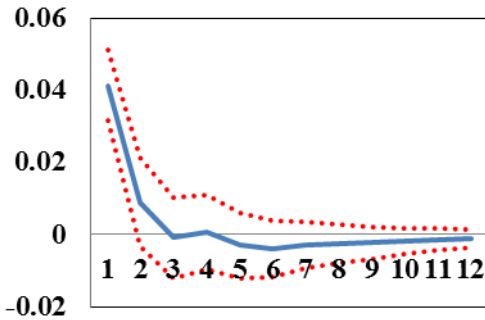


Fig 1e Response of dlnp to speculative shock

From the empirical results and analysis, we have some new understanding of crude oil market and short-term factors of crude oil price fluctuations, include the following two points:

First, we found that short-term fluctuations in crude oil price cannot be fully explained by supply and demand, inventory、 OPEC spare capacity and speculation are important short-term factors.

Second, crude oil futures market has the function of price discovery and speculation has become an important short-term factor.

Conclusions

In this paper, we analyze the impact of fundamentals、 OECD inventory、 OPEC spare capacity and speculation on oil price. We classify the above variables as supply shocks, aggregate demand shocks、 precautionary demand shocks and speculative demand shocks. Based on the SVAR model, we draw the following three conclusions.

First, we analyze the influence of fundamentals、 OECD inventory、 OPEC spare capacity and speculative shocks on oil price. The results show that the impact of supply shocks on oil prices is negative and delayed. The impact of aggregate demand shocks and speculative demand shocks on the price of oil is positive. Among them, the impact of speculative pressures on oil price greater than the demand, but the impact of speculation size on oil price is less than the aggregate demand shocks, the impact of excessive speculation is almost zero. With the increasing proportion of speculation size, speculative factors played an important role in the short-term price fluctuations.

Second, different with previous research, we put OPEC spare capacity as a precautionary demand like inventory. The results showed that OPEC spare capacity shocks indeed have an impact on oil price, but the impact is small.

Third, we explain the reasons for the decline in oil price in the second half of 2014. Consistent with most of the research, we believe that the supply shock is an important reason for the decline in the price of oil, but our results also show that speculation and economic downturn are the main factors causing the decline in oil prices so fast. Compared with the oil price fluctuations in 2008, speculation has played an important role in the process of the fell of oil price.

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