

Forecasting the Oil Price

Because Azerbaijan is an oil rich country changes in oil prices impact the economy and makes it important to take those impacts into account in monetary policy decisions. In this regard, it is extremely important to consider future dynamics of oil prices while making economic forecast. Many international organizations¹ regularly announce forecast of oil prices and the Central Bank uses those forecasts in its research and analysis. However, because those organizations usually provide oil forecast data in particular frequencies (usually twice or four times a year) and those frequencies do not necessarily coincide with the Monetary Policy Committee meeting in the Central Bank, the Research Department conducts oil price forecast and uses it for internal research and analysis along with forecasts of international organizations. Internal forecast also helps take into account not only expectations of international organizations, but also those of the subject that decides on policy decision.

For this purpose the Research department uses a model based on Kilian (2009)². Though the main purpose of Kilian (2009) is to determine structural shocks, the model is also suitable for oil price forecasting. The model is a Vector Autoregressive (VAR) model in three variables. The model can be characterized as follows:

$$x_t = \alpha + \sum_i^k A_i x_{t-i} + e_t$$

where, x_t is an $n \times 1$ vector of variables

α is an $n \times 1$ vector of parameters

A_i is an $n \times n$ matrix of parameters

e_t is an $n \times 1$ vector of disturbances.

In the current model n is 3. The variables used in the model are global oil supply (production), Global Economic Activity index (as a proxy for oil demand) and oil price. There are no cross equation restrictions on disturbance terms. In principle the structural disturbances can be restored by imposing proper restrictions, but we do not impose any restriction because the aim of estimation is only forecasting but not structural decomposition. It is obvious that the variables are dependent in the lags of all the variables in the model (hence the name vector autoregressive model).

Global oil supply and oil price data is obtained from US Energy Information Agency database. Data on Global Economic Activity index is constructed based on Kilian (2019)³ and is available in the webpage of the author.

¹ International Monetary Fund, World Bank, OOOPEK etc..

² Kilian, Lutz. 2009. "Not All Oil Price Shocks Are Alike: Disentangling Demand and Supply Shocks in the Crude Oil Market." *American Economic Review*, 99 (3): 1053-69.

³ Kilian, Lutz 2019, "Measuring global real economic activity: Do recent critiques hold up to scrutiny?", *Economic Letters*, Volume 178, May 2019, p. 106-110.