

The effects of external shocks on Azerbaijan economy


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Motivation

Over the last few decades world economy become more integrated which makes it important to learn the effects of foreign factors on the domestic economies.

We learn the effects of foreign shocks on the economy of oil rich Azerbaijan.

Azerbaijan economy faced dramatic fluctuations during the last three years which were mainly attributed to declining oil price.

In this research we want to determine:

- *if oil price is responsible also for the fluctuations in the non-oil sector of the economy and;*
- *If developments in the economies of trade partners of Azerbaijan have important impacts on the economy of Azerbaijan.*

Methodology

Similar literature primarily uses Vector Autoregressive Model (VAR).

VAR allows to track the impulse response reactions, and to learn the forecast variance decomposition of the variables. VAR model we use is in the following form:

$$y_t = \sum_{i=1}^p A_i y_{t-i} + \sum_{j=0}^q A_j x_{t-j} + u_t$$

Where: y_t is a $k \times 1$ vector of k endogenous variables;

A_i is a $k \times k$ matrix of coefficients of endogenous variables,

A_j is a $k \times n$ matrix of coefficients of exogenous variables;

x is $n \times 1$ vector of exogenous variables;

u_t is $k \times 1$ vector of error terms

Methodology

The model we use is

Structural Vector Autoregressive Model with Block Exogeneity restriction

- In the restricted VAR, the error terms are the weighted average of structural errors.
- To recover the structural errors, some restrictions should be applied: we apply Cholesky restrictions.
- The right hand side of ordinary VAR is usually symmetric with respect to lags. However, in our model we restrict lag structure such that domestic variables have neither contemporaneously nor lagged effect on the foreign variables (small economy assumption).

Data description

- We estimate the model for each of the trade partners – EU, Russia, and Turkey – separately.
- External shock variables in each group are oil price, and GDP growth and inflation (consumer price index - CPI) of the trade partner. Domestic variables are non-oil GDP growth, inflation (CPI), and non-oil exports of Azerbaijan.
- All variables are in growth terms.
- The data are quarterly spanning from 2001Q1 to 2017Q4.
- Data for domestic variables come from the Central Bank of Azerbaijan. Real oil price data comes from U.S Energy Information Administration . Data related to trade partners come from OECD and Eurostat databases.

Major findings

- Oil price is the most important external shock for non-oil sector of Azerbaijan economy
 - 10 % increase in oil price transmits to accumulated 6% increase in non-oil export and 1% increase in non-oil GDP growth by the fourth period. Oil price explains about 15% and 50% of variation in non-oil exports and GDP growth respectively by the fourth period.
- EU origin shocks have larger impact on Azerbaijan economy among trade partners
 - The responses of all three domestic variables to EU GDP growth is significant at least at one standard deviation. 10% increase in EU GDP growth transmits to accumulated 3.4% increase in non-oil exports by the fourth period. EU GDP growth accounts for about 25% of variation of inflation in Azerbaijan by the fourth period.
- A surprising finding of the research is the *insignificant* response of the domestic inflation to EU inflation
 - One explanation to this finding might be the structure of the imports from EU so that Azerbaijan mainly imports capital goods from EU which has relatively small portion in consumer basket.

Major findings

- Russia related economic variables has major impact on the price levels in Azerbaijan
 - 10% positive shock to Russian GDP growth transmits to accumulated 1 % increase, and 1 % increase in Russian price level transmits to accumulated 3% increase in Azerbaijan inflation by the fourth quarter respectively.
 - Russian GDP growth and CPI growth accounts for about 25% and 16% of the domestic inflation by the fourth quarter respectively.
- Turkey related shocks has the lesser effect on Azerbaijan economy
 - Only non-oil GDP growth of Azerbaijan responds only to GDP growth of Turkey, and the response is significant only at one standard deviation confidence level.
 - Turkey origin shocks do not account more than 4% variation of any domestic variable by the fourth period.

Discussions and conclusion

- The research shows that exogenous shocks have an important impact on the economy of Azerbaijan.
- Oil price and EU related economic shocks are of major importance.
- The paper recommends two policy responses:
 - *To diversify the economy – in order to strengthen the non-oil sector and make the economy less dependent on the oil sector.*
 - *To switch to the floating exchange rate in order to prevent imported inflation.*

Thank you for your attention !