

Natural gas price shocks impact on industries in Ukraine

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Abstract

Starting from 2006, Russia significantly increased natural gas prices for Ukraine. In the last three years it has been rising from the US\$59 per tcm to US\$180, and in the coming years it is expected to reach a transit-adjusted European market levels, presently about US\$290 per tcm. Higher prices for energy were expected to affect the overall economy, to slowdown the growth in key industries, and to have been raised the producers' price indexes. On the contrary, the empirical data demonstrated the economy to be resilient to the gas price spikes. Industries output continued to grow, which was followed by rising of prices for key export goods.

However, highly inefficient energy intensity causes external vulnerability for industries regardless of their energy consumption. While the economy demonstrated the ability to adjust to deal with gas price hikes, it is vulnerable to unfavorable terms of trade. For testing industries' resilience to natural gas price shocks it was studied, how such these strikes would push the producer price indexes. In other words, it was determined the minimum increasing in prices to provide sustainable output growth for industries.

The model which is based on the input-output framework for Ukrainian economy with 38 sectors was developed to perform the simulations. The data was aggregated by using the system of equations according to Leontief model. The natural gas price impact on the overall output was analyzed through the production side, in particular, through the amount of intermediate energy input used. While performing the model the producer price indexes sensitivity for natural gas price hikes and key export goods were determined and analysed.

The energy saving measures, which are planned by Ukrainian authorities, has to improve energy efficiency by 59% until 2030. As it was estimated by the model, the intermediate consumption of industries is not enough sensitive to these improvements and will not countervail gas price shocks. In steel production, for example, it will lead to reducing of the intermediate consumption by 5% in the whole period.

In the medium term, the costs structure of industries must be changing gradually to offset the impact of the gas price shock. The model is planned to be extended to provide the forecast for structural adjustments of Ukrainian economy.

Keywords: Input-output model, Natural gas price shock, Producer price index, Energy consumption.