EFFECTS OF OIL SHOCKS IN A QUARTERLY SVEC MODEL OF THE UNITED STATES

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(1) Overview

Oil market developments remain major drivers of global economic performance. After reaching peak levels in mid-2008 oil prices dropped dramatically to about $40 per barrel by mid-2009 under a severe global economic recession. However, oil prices have increased equally dramatically since mid-2009 and stands at almost $100 per barrel in early 2013. The immediate return of high oil prices in 2009 is a departure from the aftermath of past severe global economic recessions, and seems to be an important factor in the slow global recovery. There are several potential options to respond to the tight global oil market, including the development of alternative fossil fuel resources such as tar sands, shale oil, shale gas, and renewable energy resources. In particular, recent successes in the development of shale oil and gas resources in the United States have produced optimism that this could relieve the pressure on global oil prices. Projections suggest that the United States could become a net oil and LNG exporter in the 2016 to 2020 time frame (EIA, 2013). It is important to evaluate the potential impacts of these options on oil market variables and the macroeconomy.

(2) Methods

This study develops a quarterly structural vector error correction (SVEC) model of the US economy with a focus on the oil market. The model includes macroeconomic variables (gross domestic product, exchange rate, inflation, money supply), and oil market variables (oil price, oil consumption and OPEC spare capacity). The latter two oil market variables are crucial determinants of oil prices, but are rarely included in VAR/VEC models of the oil market. Short- and long-run parameters of our SVEC model are identified using the permanent-transitory (P-T) decomposition method of Gonzalo and Ng (2001). Impulse responses and variance decompositions of the model variables are performed, and the model is used to simulate scenarios of energy market developments in a manner similar to the approach in Cologni and Manera (2008).

(3) Results/Conclusions

The mean oil price elasticity of the US real GDP is estimated at about -1.6% with a range of +0.4% to -3.2%. Scenarios incorporating the impacts of different potential developments in the global energy market provide insights into their impacts on prices and economic performance.

References

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