Oil and the macroeconomy

Economists have long studied the link between oil prices and the macroeconomy, finding that oil price shocks have been important drivers of past recessions (Hamilton, 1983; Bjørnland, forthcoming). Figure 1 shows that the price of oil has more than doubled in recent years, rising by $40 a barrel between January 2016 and January 2018 and is forecast to increase further. In this box, we ask how an exogenous increase in the price of oil might affect the economy.

Oil price changes can affect the economy through a number of channels. One channel is simply through the valuation of oil for oil-producing economies. For those that produce oil, a rise in oil prices raises revenues. A second channel is through the terms of trade. A rise in oil prices is likely to improve the terms of trade for oil exporters, but worsen the terms of trade for importers. This tends to raise the demand for non-oil goods and services in oil-exporting economies, but reduce demand in oil-importing economies. A third channel is the role of energy as a factor of production. A rise in the price of oil might reduce usage, leading to a decline in potential output. A fourth channel is through prices. A rise in oil prices might not only increase import prices but also pass-through to consumer prices, depending on the response of monetary policy (Bernanke et al., 1997).

An important question is the source of the shock. If the increase in prices stems from rising oil demand, then there is evidence that economic activity might be less affected than if the spike arises from the supply side (Killian, 2009). Figure 2 plots a historical decomposition of the West Texas Intermediate (WTI) oil price index between the first quarter of 1988 and the third quarter of 2017. The decomposition is based on a Bayesian VAR model using sign and quantity restrictions to identify oil supply, oil demand and oil specific shocks (Killian and Murphy, 2012). The results show that the recent increase in prices has been driven by the rise of positive demand shocks and the fall of negative supply shocks.

Using the National Institute Global Econometric Model (NiGEM), we simulate the effects of an exogenous $10 increase in oil prices. Figure 3 shows the response of the world oil price, US real GDP, US inflation and the US policy rate to the shock to world oil prices. The top-left panel shows that, by construction, the shock raises oil prices by $10 in each quarter of 2018. Thereafter, the shock dissipates. The top-right panel shows that this shock reduces US economic activity on impact, peaking at roughly –0.15 per cent. The bottom-left panel shows that inflation gradually increases to a peak of approximately 0.3 percentage points and fades away thereafter. The bottom-right panel shows that the Federal Reserve would respond to this inflationary pressure by raising the policy rate. The response of the UK economy to the same shock is qualitatively similar as economic activity falls, while inflation and the policy rate rise.

In summary, the simulation shows that a further increase in oil prices would raise inflation and mildly depress output in the UK and US economies. In general, the economic impact would be conditional on a number of factors, such as domestic oil reserves, the oil intensity of output, the response of monetary policy and the source of the shock.
Oil and the macroeconomy (continued)

Figure 3. Response of world oil price, US real GDP, US inflation and US policy rate to a temporary $10 world oil price shock

Source: NiGEM.

REFERENCES

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