



Banc Ceannais na hÉireann  
Central Bank of Ireland

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Box A:

QB 2 – April 2022

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## Benchmarking the Uncertainty Around the Central Forecast

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While the central forecasts take into account the latest available information on energy and other key assumptions, the situation is highly uncertain and, in particular, energy prices have been extremely volatile in recent weeks. Depending on the path of the conflict, there is a risk that energy prices could be higher than assumed in our central forecasts. Given this uncertainty, in this Box we consider two stylised scenarios where energy prices are higher than the baseline. We assess the potential impact of these scenarios on the global economy and on Ireland using the NiGEM and COSMO models.<sup>2</sup> The modelling exercise accounts for the different transmission channels of an energy-related supply-side shock discussed above.<sup>3</sup>

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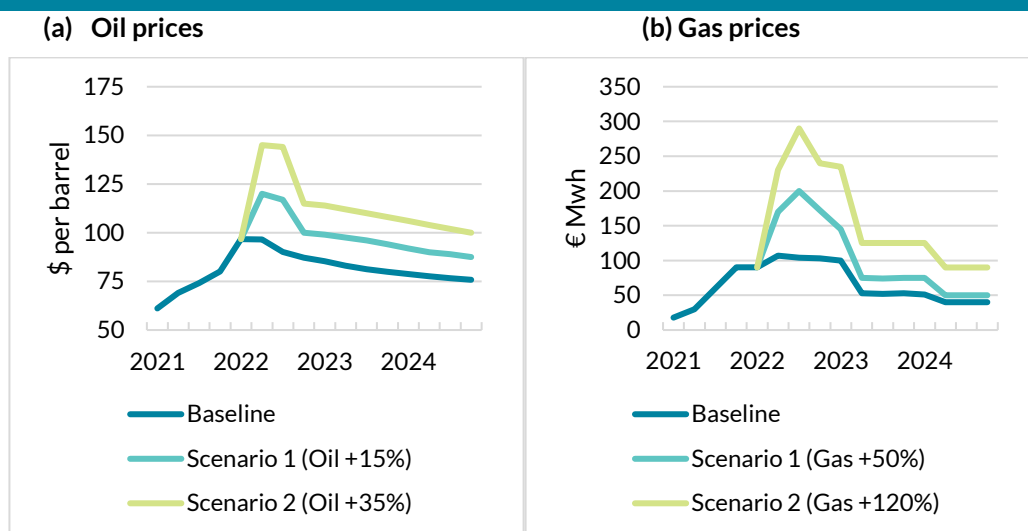
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<sup>2</sup> NiGEM is a global economic model developed by the National Institute of Economic and Social Research in the UK. The model documentation can be found at: <https://nimodel.niesr.ac.uk/> COSMO is a model of the Irish economy used by the Central Bank (see [Bergin et al \(2017\)](#) and [Conefrey, O'Reilly and Walsh \(2018\)](#)).

<sup>3</sup> The scenarios assume that monetary authorities view the shock as temporary in nature and do not respond by raising interest rates in response to higher inflation. Moreover, we do not include other potential policy responses such as stockpile releases and fuel subsidy payments to households.



Figure 1: Oil and Gas Price Scenarios



Source: Own calculations

Figure 1 shows the baseline forecasts for energy prices, which are based on the latest futures curves, and two stylised scenarios. In scenario 1, the price of oil and gas is assumed to be 15 and 50 per cent higher than in the baseline in 2022. In scenario 2, oil and gas in 2022 are assumed to increase by 35 per cent and 120 per cent above the baseline. These scenarios reflect purely technical assumptions on possible future energy prices designed to illustrate the sensitivity of the central forecasts to alternative energy assumptions.

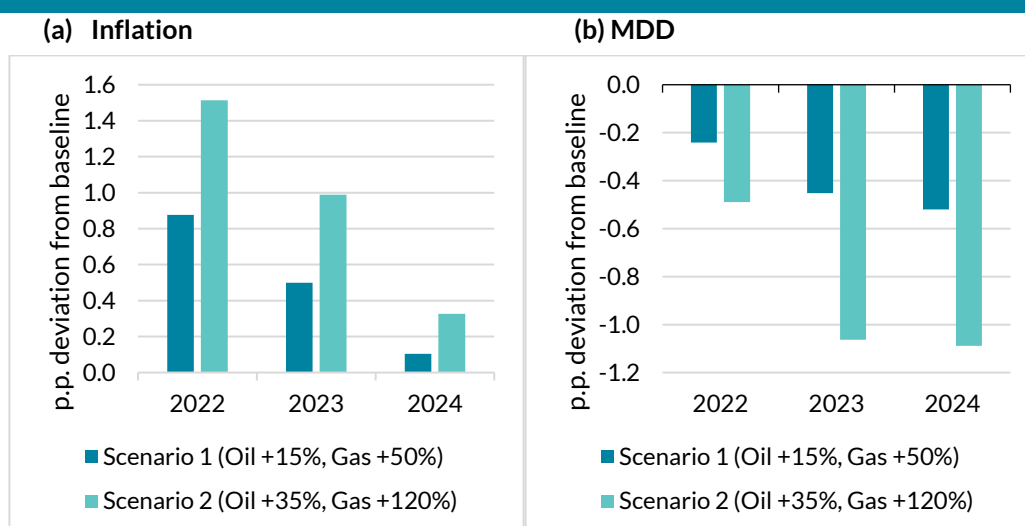
Figure 2 shows the estimated effect of the energy price scenarios on inflation and domestic demand in Ireland relative to the Quarterly Bulletin baseline forecasts. In scenario 1, inflation would increase by just under 1 percentage point and MDD growth would be 0.2 percentage points lower in 2022 than in the baseline. In the second scenario involving more significant increases in energy prices, inflation would rise by 1.5 percentage points in 2022 and MDD growth would be 0.5 percentage points lower than in the baseline projections. Consistent with the expected channels through which these type of shocks transmit, higher energy prices in excess of the baseline assumptions would increase inflation and reduce growth in Ireland relative to our central forecast.<sup>4,5</sup>

<sup>4</sup> There is some literature to suggest that there may be asymmetries and nonlinearities in the transmission of oil price shocks. Our modelling scenarios use linear models, so nonlinear relationships would have the potential to amplify some of our results. However, there is no consensus on the existence or size of these possible non-linear effects and Kilian (2008) concludes that there is no compelling evidence of nonlinear effects at the macroeconomic level.

<sup>5</sup> The impact of the high energy price scenarios on inflation and demand would be influenced by the prevailing cyclical position of the economy and conditions in the labour market.



Figure 2: Impact of Energy Scenarios on Irish Inflation and Growth



Source: Own calculations.

These scenarios provide estimates of the sensitivity of baseline inflation and growth forecasts to a change in assumptions on energy prices. There are some caveats that should be considered in interpreting the results. First, the scenarios consider the impact of increases in energy prices in isolation. No additional shocks to consumer prices such as from increases in non-energy food or other commodities are included. If further energy price rises were accompanied by increases in other non-commodity prices or other changes in the wider economic environment, then the impact on inflation and growth could be larger than reported here. Relatedly, increases in energy prices such as those considered in both scenarios could be accompanied by a rise in uncertainty. If uncertainty effects were included in the modelling scenarios, they would amplify the negative effect on aggregate demand.

As well as further increases in prices, another more damaging outcome is the potential for the rationing of energy supplies in Europe, in particular gas, depending on the path of the war over the coming months. While Ireland does not have direct reliance on Russian gas, a shortage of gas at EU level is still likely to have an impact if some of Ireland's currently imported gas supply was diverted to other EU Member States. Gas provided 34 per cent of Ireland's primary energy supply in 2020, with around 64 per cent imported via gas interconnectors from Scotland.<sup>6</sup> Gas accounted for just over half (51 per cent) of the electricity generated for end users in Ireland in 2020. Given the importance of gas for electricity generation in Ireland, rationing of supply would have significant negative implications for the output and exports of energy-intensive manufacturing sectors.

<sup>6</sup> See [https://www.seai.ie/publications/Energy-in-Ireland-2021\\_Final.pdf](https://www.seai.ie/publications/Energy-in-Ireland-2021_Final.pdf) and [https://www.gasnetworks.ie/docs/corporate/company/Irelands-Gas-Network\\_Delivering-for-Ireland\\_FINAL-file-as-published-11-11-2021.pdf](https://www.gasnetworks.ie/docs/corporate/company/Irelands-Gas-Network_Delivering-for-Ireland_FINAL-file-as-published-11-11-2021.pdf)



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Lastly, an important consideration is the elasticity of substitution for different factors of production, particularly intermediate inputs.<sup>7</sup> It is challenging to estimate the degree of substitutability between different intermediate inputs reliably and this measurement problem would be compounded if there were large changes to the input mix across Europe. It is plausible to assume that the elasticity of substitution is larger in the medium to long run and smaller in the very short run. Thus, the macroeconomic effects of the Russian invasion of Ukraine depends crucially on the duration of the war and how production processes and inputs may adjust in response to price changes over time.

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<sup>7</sup> <https://www.ifo.de/publikationen/2022/working-paper/what-if-economic-effects-germany-stop-energy-imports-russia> (published 7 March, 2022).