Banc Ceannais na hÉireann
Central Bank of Ireland
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Box D: QB 2 – June 2023

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Impact of Pipeline Pressures on the Inflation Forecasts

By Stephen Byrne, Darragh McLaughlin, and John Scally[1]

The surge in input costs over the past two years has led to a marked increase in the prices faced by producers and wholesalers in Ireland. In turn, these input price increases have been passed on to consumers, as reflected in the historically high rates of consumer price inflation seen over the past number of quarters (Byrne, McLaughlin, & O'Brien 2022). Of these input costs, the price of energy and food have seen the largest increases. Koester et al (2021) show that these input cost shocks generated "pipeline" pressures in the early stages of the production process, which are passed through to consumer prices. However, food and energy commodity prices have begun to fall sharply during the first half of 2023 (Figures 1 & 2), but consumer prices for food and energy have fallen more slowly. How much these commodity price decreases pass through to consumer prices depends on many factors, in particular the extent to which firms pass them on or use them to maintain or increase profit margins (see Box E).

The spike in oil and gas prices during 2022 precipitated a historical increase in the HICP energy price index (Figure 2). For retailers of electricity, home heating oil, and other fuel products, the increase in wholesale energy prices represented a large shock across the entirety of their production chain. Accordingly, the pass-through to consumer prices of this shock was sizeable and quick. However,

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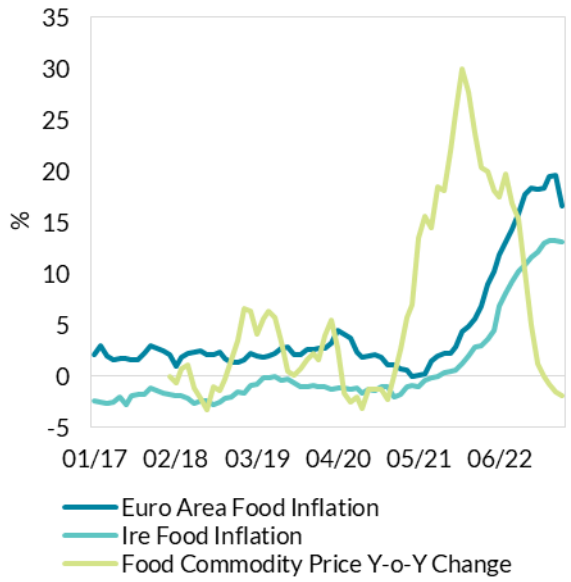
these commodity prices have fallen sharply since the third quarter of 2022, yet retail energy prices for gas and electricity have not declined for Ireland during 2023 (Figure 3).[2]

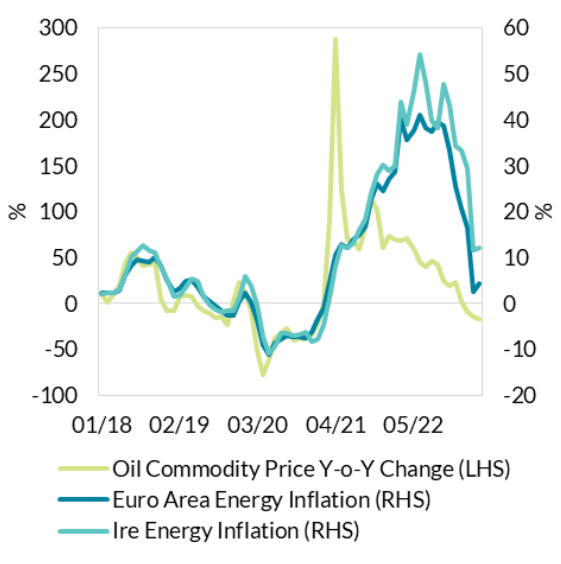
Historic Food and Energy Price inflation begin to ease

Figure 1: HICP food price inflation & food commodity price year-on-year % change



Source: Eurostat, ECB
Note: Food price commodity index contains an aggregation of agricultural commodity prices relevant to food price inflation (e.g. wheat, soy, cereals, meat)

Figure 2: HICP energy price inflation & oil commodity price year-on-year % change

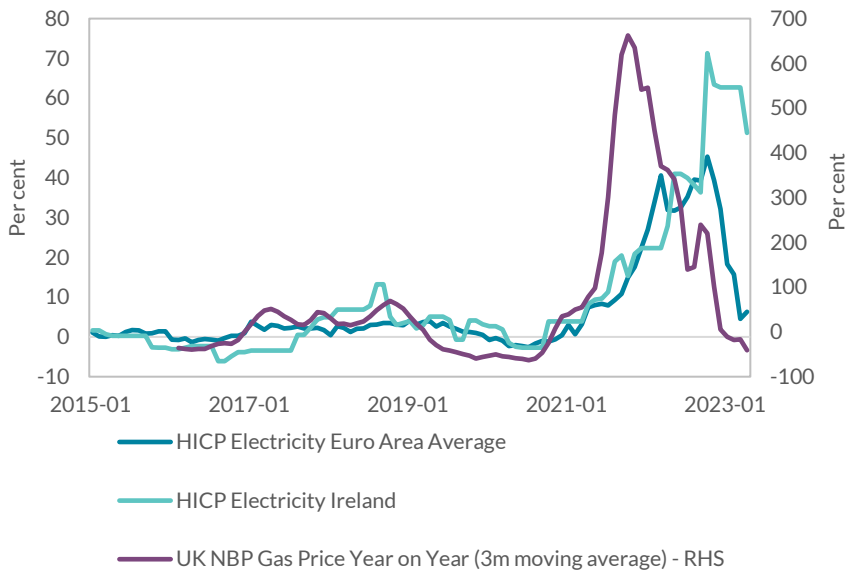


Source: Eurostat, ECB

[2] The slight decline in the consumer price energy index relates to the quicker pass-through of recent oil price declines to petrol, diesel and home heating oil.

Electricity prices have not fallen in Ireland at the same speed as the euro area

Figure 3: HICP Electricity and gas prices.

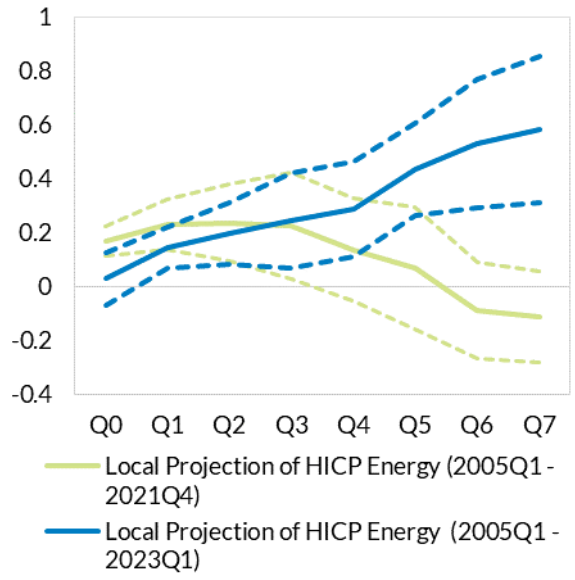


Source: CSO Quarterly National Accounts, CSO Productivity in Ireland 2021 and Central Bank staff estimates.
Note: The ULC contribution is the sum of the contributions of labour compensation and labour Productivity. GVA inflation is then the combination of the ULC and unit profits contribution.

Historically, changes in the wholesale price of energy and food were not as large and not as persistent. Figure 4 & 5 illustrate the effects on consumer prices from a change in producer prices. Before Russia's invasion of Ukraine, shocks in energy tended to phase out after 3 quarters. Shocks now are more persistent and can have larger impacts up to 7 quarters into the forecast horizon. This signifies that, in particular for energy, the increase in wholesale prices were passed on to consumers more forecefully and over a longer time period than had been the experience before the Russian invasion of Ukraine. Conversely, wholesale price decreases should result in decreases in consumer prices into the forecast horizon.

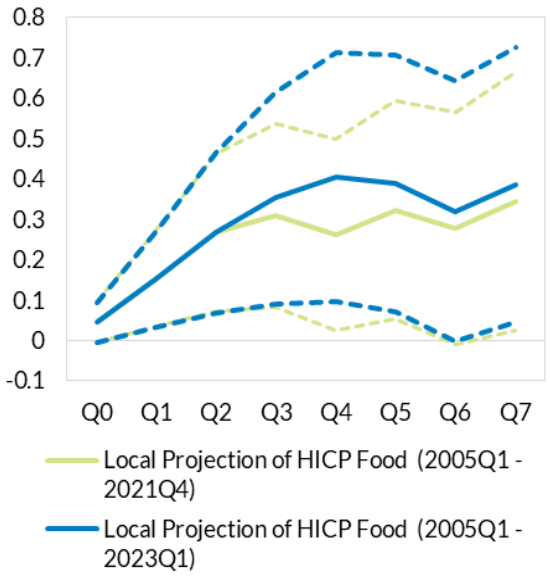
Commodity price shocks are larger and more persistent

Figure 4: Cumulative impulse response [3] of HICP energy to a 1% change in the wholesale price of energy



Source: Authors' calculations

Figure 5: Cumulative impulse response of HICP food to a 1% change in the wholesale price of food



Source: Authors' calculations

A number of factors complicates the pass-through of input costs to consumer prices in the energy sector. In particular, energy retailers use financial markets to "hedge" the future price of oil and gas. This means that firms may have contracts to purchase oil and gas and other energy products today at prices significantly different than those commodities are currently trading on spot markets. To the extent that these hedging strategies are consistent over time, our model should still capture the relationship between input costs and their eventual pass-through to consumer prices. However, it is possible that some firms altered their hedging strategies in the face of the oil and gas price shocks of in early2022. As a result, the pass-through of energy price falls may be slower than that of energy price increases.[4]

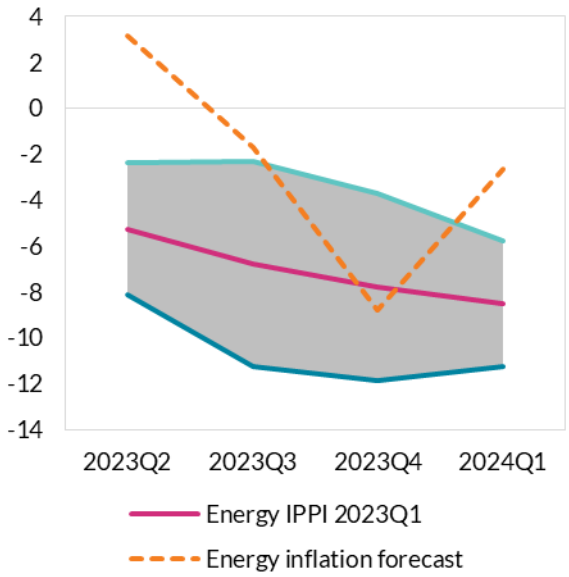
[3] The dotted lines indicate 95% confidence bands. The horizontal axis shows quarters after the impact. The reduced form equation is estimated using the local projections method following Jordà, Ò., "Estimation and Inference of Impulse Responses by Local Projections", American Economic Review, Vol. 95, No 1, 2005, pp. 161-182. The green lines estimate an impulse response with data running up until Q4 2021, while the blue lines represent an impulse response estimated until Q1 2023. The regression equation includes the logs of the HICP index and the Producer Price Index and up to 7 lags for both energy and food.

[4] In addition, pass-through to consumer energy prices could depend on the number of customers on fixed price contracts. Also, in practice, energy suppliers don't change prices on a monthly basis based on their exposure to future contracts. They generally wait for these pressures to build which results in prices changes greater in

Here, we derive indicators for producer price pressures for both energy and food price indices based on the methodology outlined by Koester et al (2021). Their model uses local projections to assess the cumulative change in energy and food prices from changes in their respective wholesale input price series. The aggregate changes are then used to create a pipeline pressure series.[5] The implied price declines from the decrease in these "pipeline" pressures for energy prices are shown in Figure 6 alongside the expected changes in actual energy prices. Pipeline pressures in energy are to subdue in the next few quarters. The extent to which this is passed on to consumer prices depends on past "hedging" strategies of firms, as well as the multitude of factors outlined above. Overall, the drag being exerted by lower pipeline pressures is underpinning the expected path of consumer energy prices.

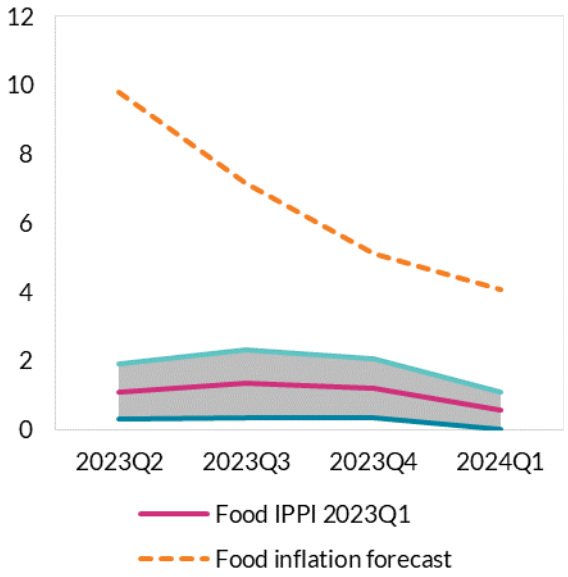
Pipeline pressures for food and energy to ease

Figure 6: Energy Pipeline pressures and inflation forecast



Source: Author's calculations

Figure 7: Food Pipeline pressures and inflation forecast



Source: Author's calculations

magnitude but less frequent. These factors can affect the pass-through of input prices to actual measured consumer prices.

[5] The shaded area indicates the 95% confidence bands. The horizontal axis shows quarters after the impact. The reduced form equation is estimated using the local projections method following Jordà, Ò., "Estimation and Inference of Impulse Responses by Local Projections", American Economic Review, Vol. 95, No 1, 2005, pp. 161-182. This method allows a time profile to be obtained for the impact of the variable of interest. The regression equation takes results from figures 5 & 6 and the estimation sample runs from 2005Q1 to 2023Q1. A cumulative impulse response is obtained and it, combined with its error bands is in turn used to create a pipeline pressures index for both energy and food prices.

Food prices increased sharply during 2022, reflecting the large increases in commodity prices for crucial inputs like wheat, grain and the effect of energy price increases on production and transport costs. These "pipeline" pressures have led to increases in consumer prices for food during the first half of 2023 (Figure 1). In recent months however, the price of these inputs has also flat lined but food inflation remained elevated and above that implied by the decrease in input price growth. In Figure 7, we show that this decrease in food "pipeline" pressures, i.e. the decrease in producer prices for food, imply a deceleration in food price inflation in the second half of 2023 into early 2024.

To conclude, sharp increases in commodity prices for energy and food in 2022 led to an increase in producer prices, which in turn passed through to historically-high increases in consumer prices for food and energy. In recent quarters, decreases in oil and gas prices on wholesale markets have translated into a decline in producer prices, but this has not passed-though fully in the deceleration of consumer prices yet. However, easing pipeline pressures are beginning to have an effect, which is expected to become more prominent.