## Box B: Modelling inflation in Ireland

This box explores the use of a formal forecasting model for developing inflation projections for the medium term as compared to the *Budget* 2022 forecasts, which are largely based on judgement. Inflation is modelled on unemployment, external prices, and inflation expectations.

Figure B1 presents market-implied expectations for ten-year inflation in France, derived using benchmark and inflation-linked bond yields. France's inflation expectations are shown as its inflation-linked bond market is the most liquid for the Euro area. After a period of decline over much of the past decade, inflation expectations over the coming ten years have recently reached 2 per cent, the highest level since April 2014. Byrne and Zekaite (2019) present evidence of weaker anchoring of inflation expectations after 2013 and emphasise that well-anchored expectations are important to ensure against inflationary or deflationary spirals.

### Figure B1: Inflation expectations have risen rapidly since the pandemic began

% (France implied ten-year breakeven inflation rate)


Sources: Refinitiv Eikon, and Fiscal Council workings. Get the data.

Notes: The chart shows France's implied ten-year breakeven inflation. It is calculated using the following formula: 100 * ((1 + nominal ten-year bond yield in %) / (1 + real ten-year bond yield in %) – 1). The real ten-year yield refers to the yield on a generic French HICP-linked government bond, whose coupon adjusts for the level of HICP. The breakeven is therefore the implied ten-year compound average rate of inflation for which a nominal government bond compensates an investor relative to the real yield on the inflation-linked bond.

### Modelling medium-term inflation in the Irish economy

Galstyan (2021) conducts an empirical investigation into inflation determinants. Focusing on Ireland, it notes the significant role that domestic slack has in influencing price inflation over the medium term.

Based on Galstyan's findings, HICP inflation can be forecast in a quarterly error-correction model based on inflation expectations, and seasonally adjusted unemployment rates and price inflation on imports of goods and services.[10] The sample period used here covers the period Q1 1990 to Q2 2021.

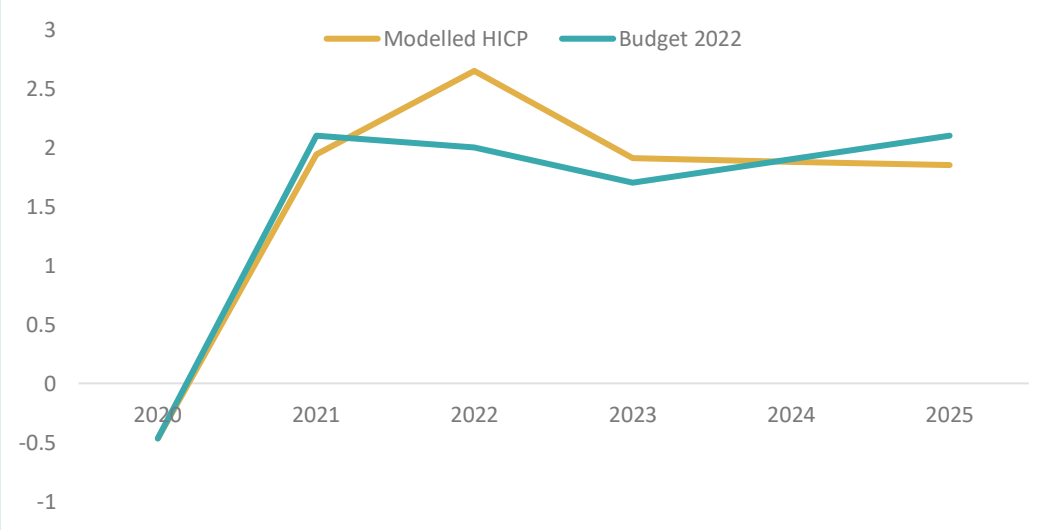
[10] Inflation expectations are taken as one-year-ahead inflation rates projected by the IMF (where spring forecasts are applied to Q1 and Q2 for year t+1, and autumn forecasts are applied to Q3 and Q4 for year t+1). Beyond 2022, the latest projections from autumn 2021 are used. The seasonally adjusted unemployment rate is mechanically extended quarterly back to 1990 using the annual labour force survey, while the import price deflator is also mechanically extended using the historical annual national income and expenditure data.

Figure B2 compares the modelled rates of HICP inflation with *Budget* 2022 projections. *Budget* 2022 forecasts are model-based for part of 2021 and 2022, and judgement-based thereafter. The rapid fall forecast for the unemployment rate in 2022 contributes to a rise in HICP inflation next year, whereas the *Budget* 2022 forecasts entail a slightly slower rate of inflation in 2022 compared to 2021. However, the projected growth rates for HICP are otherwise very similar, suggesting a return toward 2 per cent annual inflation. This is consistent with inflation expectations based on the recent ten-year French breakeven rates.

There are limits to using conventional models of inflation in unusual circumstances such as the current ones. For example, when unemployment rose rapidly in 2020, inflation did not fall in a corresponding manner. As a result, one might not expect falls in unemployment to fuel a significant acceleration in inflation. In fact, many of the factors that are likely to cause increases in inflation at present would not be typically captured by conventional models (supply-chain issues, energy price increases, temporary labour supply issues and pent-up demand).

**Figure B2: Model-based forecasts broadly align with judgement-based forecasts**

% growth year-on-year




Sources: Department of Finance, and Fiscal Council workings. Get the data.
Notes: The "Modelled HICP" forecasts are based on an error-correction model using inflation expectations, seasonally adjusted unemployment rates and price inflation on imports of goods and services.

While the model-based forecasts align well with those produced by the Department, there is scope to improve how medium-term inflation forecasts are founded. Inflation forecasts could be more usefully linked to developments in the domestic economy and its spare capacity. Factors like this and the role of expectations becoming entrenched could take on greater importance in the coming years.