

Box 1.2.4: Which Factors Shape Growth and Inflation Going Forward? Model-Based Insights into the Spring Forecast

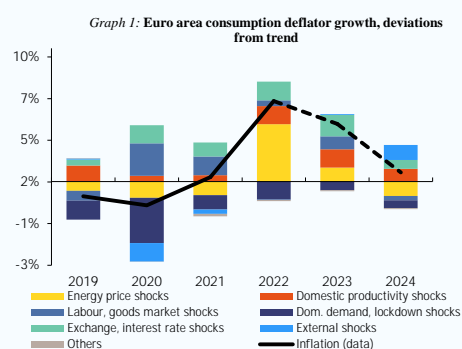
Understanding the drivers of growth and inflation in the EU is key for interpreting an Economic Forecast. The judgement-based approach underpinning the European Economic Forecast can be complemented by an analysis of the fundamental forces behind short-term macroeconomic fluctuations through the lens of an estimated structural macroeconomic model. The presented ‘shock-decomposition’ analysis takes the European Commission’s Spring Economic Forecast as input and recovers the exogenous factors (‘shocks’) that explain it in a model-consistent way. Hence, the analysis offers a stylised yet quantitative interpretation of the forecast.

The model-based analysis presented in this box points to the continued role of terms of trade and supply conditions in shaping the economic outlook in the EU. After a still sizeable impact of past increases in energy prices on inflation and growth in 2023, forecasts of GDP growth and inflation gradually revert to their long-run trends in 2024. In this regard, this model-based analysis illustrates the importance of labour market dynamics and the pass-through of energy price (dis)inflation for the economic outlook. Moreover, there are other drivers, such as the increase in the price of processed food, which the model only partially captures.

The analysis employs an estimated structural macroeconomic model to shed light on the key factors driving **the European Commission’s Spring 2023 Forecast for growth and inflation**. The Global Multi-Country (GM) model is an estimated multi-country Dynamic Stochastic General Equilibrium (DSGE) model of the euro area. It draws upon a rich data set of over 30 different time series, including, among others, national accounts variables, and trade flows. The model has been recently enriched to take into account key developments in the energy market. The model parameters are estimated with Bayesian techniques based on historical data. The series are extended with forecast variables to cover the period until 2024.

The model allows quantifying the impact of changes in external assumptions and shocks that, conditional on historical information, are most likely to drive the short-term dynamics. The model applies the same external assumptions specified in the forecast. In particular, for energy, it relies on expectations of gas and oil prices based on futures markets, following the assumptions outlined in Box 1.5.1. The explicit modelling of external assumptions allows to assess the impact of changes in the assumed path of energy prices, interest rates and external demand on forecast variables. Moreover, by comparing historical data extended with forecasts with the corresponding model variables, it is possible to identify the exogenous factors (shocks) that are likely to drive economic short- and medium-term dynamics, according to the model estimates.⁽¹⁾

The stagflationary impact of the surge in energy prices in 2021 and especially 2022 continues to play out in 2023. As shown in Graph 1, these shocks (yellow bars) remain an important driver of inflation in 2023 after explaining the bulk of the 2022 inflation spike.⁽²⁾ According to model estimates, higher energy prices will continue to drag on economic activity in 2023, while the positive effect of falling energy prices will push up GDP growth only as 2024 (Graph 2). This is because the negative contribution of energy price shocks includes second-round effects via, e.g. core inflation and labour markets that persist even as the initial



⁽¹⁾ The model identifies the driving forces and transmission mechanisms using theory-based restrictions across variables and over time. In particular, the ability of the model to fit the observed data determines the size of the various domestic and foreign demand and supply shocks.

⁽²⁾ In Graphs 1 and 2, stacked coloured bars represent contributions of groups of shocks to deviations of growth and inflation from long-term trends, indicated by dashed bold horizontal lines in both panels. Bars above (below) this line indicate positive (negative) contributions.

(Continued on the next page)

Box (continued)

commodity shock is progressively reversed. Other shocks from the external environment (e.g. non-commodity import price and trade shocks) contribute positively to inflation in 2024, while their effect on GDP growth remains more limited, as indicated by the light blue bars.

Additional inflationary pressures over the forecast horizon come from domestic supply factors, while the impact of shocks to wage dynamics has remained more limited. Productivity shocks (red bars) capture broad price-increasing supply-side deteriorations. These add to inflationary pressures coming from energy. Moreover, inflationary shocks to goods market conditions are consistent with the observation of increased profit margins. Nominal wages, in contrast, have only partially recovered the fall in purchasing power – especially in 2022. In sum, shocks affecting labour and goods markets (purple bars) have contributed little to last year's surge in inflation. Regarding GDP growth, the joint contribution of both groups of shocks (i.e. productivity and labour and good market) is most negative in 2022 and eases over the forecast horizon until it turns positive in 2024.

Pent-up demand, further propped up by government subsidies, is key in explaining the resilience of the EU economy in 2022 and 2023. In the early stages of the pandemic crisis, lockdowns led to a strong demand contraction and drove up savings. The release of excess savings propped up demand in 2021 and especially in 2022. Domestic demand and (reverting) lockdown shocks, however, continue to push consumption above its model-implied level also in 2023, possibly reflecting the positive impact of energy-related fiscal measures.

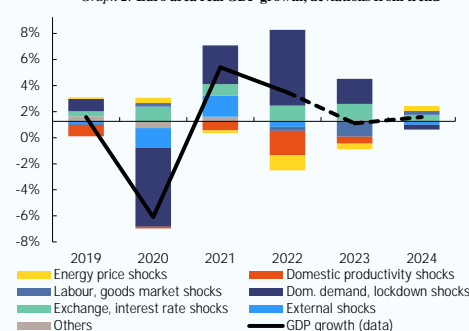
It is interesting to note that lockdown shocks in the model had relatively mild effects on consumer prices, possibly because the nature of the shock did not lead to a significant upward revision of inflation expectations. Over the forecast horizon, domestic demand shocks are expected to put less downward pressures on inflation than in 2019 and 2020. Nonetheless, while the adverse impact of these shocks on GDP growth vanished, they continued to weigh on the level of economic activity for longer, translating into low inflation pressure.⁽³⁾

Finally, exchange and interest rate shocks (green bars) contribute positively to growth but also added to inflation. In particular, interest rate shocks support GDP and inflation. This is because the current and expected level of interest rates is below the level corresponding to the Taylor-type monetary policy rule built in the model, which – based on the current level of the output gap and inflation – would yield higher policy rates. Shocks associated with the euro depreciation in 2022 also drive up consumer prices (notably in 2022 and 2023).

Some caveats need to be made. The driving factors that are recovered in this model-based analysis are conditioned on the structure of the model and the estimated parameter values. While the model aims to capture crucial aspects of the current macroeconomic environment, it necessarily simplifies reality and can only represent a limited set of economic transmission mechanisms. For example, the model does not include energy-related (tax) policies beyond excise duties. Moreover, the large shocks and non-linear effects associated with the pandemic and Russia's war of aggression pose methodological challenges for model estimations. Finally, the analysis considers the euro area as a whole, disregarding the wide variation in growth and inflation developments across euro area countries (see the country-specific chapters).

⁽³⁾ Before the pandemic, the model suggests that deflationary domestic demand shocks had persisted for a long time, which kept inflation below target. In addition, real wage rigidities can generate further inflation inertia (in line with the analysis above), explaining a partial decoupling of GDP growth and inflation. On the role of real rigidities, see also Blanchard, O., and J. Galí (2007). 'Real wage rigidities and the New Keynesian model'. *Journal of Money, Credit and Banking*, 39, 35-65.

Graph 2: Euro area real GDP growth, deviations from trend



In general, employment losses and gains since the pandemic have been strongly related to education levels. The educational attainment gap closed somewhat in 2022, as employment of