

Box 1.3: Euro area GDP growth drivers in 2019 – analysis using a structural model

The real GDP of the euro area is forecast to grow by 1.9% in 2019. This box presents a decomposition of the growth forecast using a structural macroeconomic model.⁽¹⁾ The model features two regions, the euro area and the rest of the world (RoW), and it has been estimated using quarterly data for the period from the first quarter of 1999 to the second quarter of 2018. Estimation of a structural model allows for the identification of shocks, i.e., the exogenous factors that drive the short- and medium-term deviations of the endogenous variables from their long-run trends (including GDP, inflation, domestic demand, and trade), and it provides an interpretation of the dynamics from the perspective of economic theory.⁽²⁾

Model-based forecast decomposition

The model-based analysis proceeds in three steps. In the first step, the model is estimated on historical data. The data set is then extended by the European Commission's autumn 2018 forecast until 2019 for the set of the available variables. The final step recovers the shocks⁽³⁾ that are necessary for the model to replicate the forecast values given the estimated model parameters and historical shocks.

Using a detailed structural model to decompose macroeconomic dynamics has the advantage that the model can exploit the rich information provided by the data. In particular, a detailed model allows for the driving forces to be identified on the basis of restrictions imposed by the model equations, i.e. by economic theory, across variables and over time. The sign and size of the different domestic and foreign demand and supply shocks, including financial, commodity price, productivity, and policy shocks, is determined by the ability of these shocks to fit not only GDP, but also other observed

variables in the model, such as consumption, investment, trade, employment, and their co-movement.

The various drivers (the model includes 29 types of exogenous shocks) are summarised into seven distinct groups of factors, namely: (1) shocks to euro area productivity; (2) euro area labour and goods market adjustment as captured by wage and price mark-up shocks; (3) oil price shocks; (4) euro area domestic demand shocks, i.e. changes in consumption and investment demand in the euro area that are not explained by fundamentals such as household income, interest rates and return expectations on physical capital and financial assets; (5) euro area monetary policy shocks that capture deviations of short-term interest rates from the estimated policy rule; (6) euro area exchange rate shocks, which affect the exchange rate of the euro independently of the monetary policy stance; and (7) shocks to world demand and international trade, which include foreign demand and supply shocks and deviations of trade volumes and prices from the estimated export and import demand and pricing equations. The remaining shocks and the effect of initial conditions are summarised as 'others'. The groups (1) to (3) act mainly on the euro area economy's supply side, whereas (4) to (7) predominantly affect demand for goods and services in the euro area in the short and medium term. The model-based decompositions presented below identify the importance of each of these groups of shocks.

Domestic demand drives GDP growth...

Graph 1 displays the model-based decomposition of annual real GDP growth. The solid black line shows the historical data, and the dashed line represents the European Commission's forecast for 2018 and 2019. The coloured bars show the contribution of the groups of driving forces to deviations of GDP growth from its long-run trend of approximately 1.4%, i.e. the value at which the (solid) horizontal axis intersects the vertical axis. Bars above (below) this horizontal axis indicate positive (negative) contributions to GDP growth in a given year. The sum of positive and negative contributions matches the data (black solid line) for any point in time.

The decomposition of real GDP growth in Graph 1 points to domestic demand as the main driver of above-trend growth in 2019. The positive growth contribution by domestic demand is attributed by

⁽¹⁾ These results are based on the Global Multi-Country (GM) DSGE model developed by DG ECFIN and the Joint Research Centre of the European Commission. A detailed description of the GM model can be found in: Albonico, A., L. Calès, R. Cardani, O. Croitorov, F. Ferroni, M. Giovannini, S. Hohberger, B. Pataracchia, F. Pericoli, R. Raciborski, M. Ratto, W. Roeger and L. Vogel (2017). 'The Global Multi-Country Model (GM): an Estimated DSGE Model for the Euro Area Countries'. *Working Papers 2017-10, Joint Research Centre, European Commission*.

⁽²⁾ The model is a structural macro-model in the New-Keynesian tradition with rigorous microeconomic foundations derived from utility and profit optimisation and including frictions in goods, labour and financial markets.

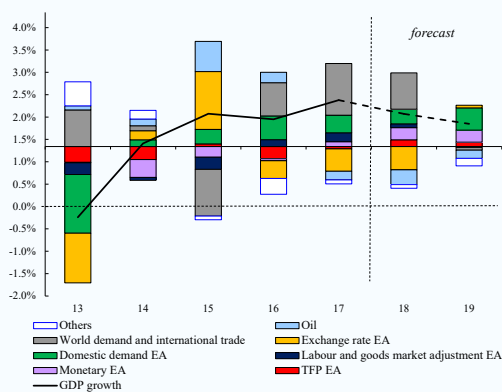
⁽³⁾ The different types of domestic and foreign shocks on the demand and supply side are discussed below.

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Box (continued)

the model mostly to private consumption. In addition, monetary policy remains expansionary compared to the model's monetary policy rule (targeting a positive output gap and consumer price inflation close to 2%), which is reflected in negative shocks attributed by the model to the policy rate. The negative shocks to the policy rate support euro area GDP growth by stimulating interest-sensitive components of domestic demand (such as investment and durable consumption goods) and by strengthening net exports via depreciation of the euro's nominal effective exchange rate. Regarding supply-side drivers, Graph 1 indicates a small positive contribution from productivity (TFP) growth, whereas increasing oil prices in 2019 have a dampening impact on growth (increase by about 7% in USD terms relative to 2018 in the forecast assumption based on future prices). According to the model, the positive contribution from world demand and international trade peaked in 2017, diminishes in 2018 and turns slightly negative in 2019.

Graph 1: Euro area real GDP growth

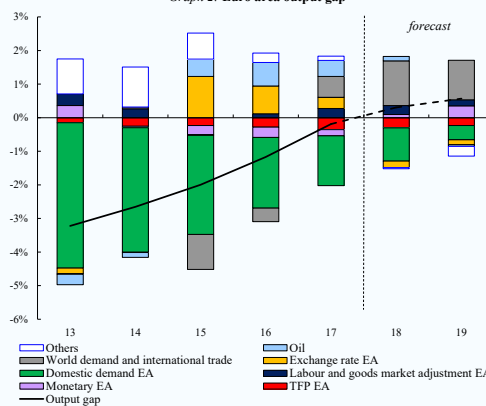


...but remains still below long-run levels...

While domestic demand, in particular private consumption, appears as the dominant positive contributor to growth in 2019 (see Graph 1), the legacy of weak domestic demand still affects the level of euro area activity negatively, compared to its long-run trend. This is illustrated by the decomposition of the output gap as the percent gap between actual GDP and potential GDP in Graph 2. Downward pressure from weak domestic demand on output levels has subsided in recent years in line with a deceleration of post-crisis deleveraging in the private sector. Its negative impact on the level of economic activity is estimated to decline further according to the forecast, in line with the positive contribution of domestic demand factors to GDP growth in 2019 (see Graph 1). Despite the gradual recovery of domestic demand and its contribution

to closing the output gap in recent years, the contribution of domestic demand factors to the output gap is still negative. By contrast, reflecting its positive contributions to growth since 2016, the contribution from world demand and international trade to the level of GDP is still positive in 2019 (but smaller than in 2018). Also, Graph 2 points to a positive contribution of monetary policy to the closing of the output gap and its move into positive territory over the forecast horizon, in line with the positive 2019 growth effects in Graph 1.

Graph 2: Euro area output gap

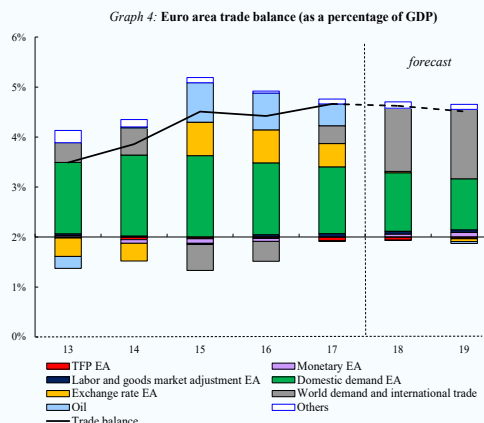
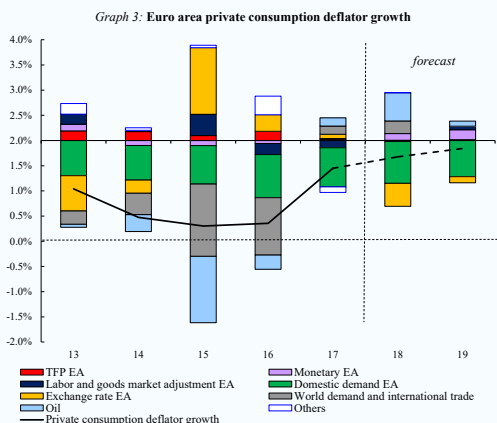


...while inflation increases only gradually in 2019...

The fact that domestic demand still hovers below the historical average in the forecast also affects euro area inflation and net exports. Inflation, as measured by the annual growth of the private consumption deflator, is expected to rise moderately in 2019 (Graph 3), but the inflation rate remains below the ECB's definition of price stability, which is close to but below 2%. According to the decomposition from the estimated model, depressed levels of domestic demand remain the main reason for the still subdued pace of annual inflation. Its contribution dominates the positive contribution from the monetary policy stance and from cost-push factors, among which the projected increase in oil prices has the largest effect. As explained above, the contribution of 'monetary policy' only reflects the deviation of interest rates from a Taylor rule. Unconventional monetary policy measures are not explicitly considered but may be partially captured by exchange rate fluctuations and additional domestic demand. This explains the relatively small size of monetary policy shocks over time according to the model.

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Box (continued)



...and the trade surplus is forecast to persist.

The subdued momentum of domestic demand, which dampens the demand for imports, explains around 1.0% of GDP of the euro area’s trade surplus projected for 2019. The forecast incorporates world demand and trade factors, as the other important driver of the surplus in 2019 (contribution of 1.4% of GDP). In addition, the decomposition in Graph 4 points to a minor positive contribution from expansionary monetary policy to net exports in 2019 and small negative contributions from the nominal appreciation of the euro and the rise in oil prices, which are part of the forecast assumptions for 2019. ⁽⁴⁾

Taken together, the model-based decomposition presented in this box attributes above-trend euro area real GDP *growth* in 2019 to continued domestic demand growth and to an accommodative monetary policy stance. Domestic demand levels remain below the historical average, however, implying a still negative (although diminishing) contribution to the *level* of economic activity. Below-average levels of domestic demand also explain low levels of inflation in the euro area and a significant part of the trade balance surplus incorporated in the European Commission’s forecast for 2019.

⁽⁴⁾ For a detailed account of euro area trade balance drivers in recent years, see Giovannini, M., S. Hohberger, R. Kollmann, M. Ratto, W. Roeger and L. Vogel (2018): ‘Euro Area and U.S. External Adjustment: The Role of Commodity Prices and Emerging Market Shocks’. *CEPR Discussion Papers 13141*.