

Box 1.1: Looking at euro area GDP growth in 2019 through the lens of an estimated model

Euro area real GDP is forecast to grow by 1.2% in 2019, 0.7 pps. lower than expected in the 2018 autumn forecast and below its long-run trend for the first time since 2013. The downward revision of the forecast for real GDP has been accompanied by a weaker outlook for inflation and a slight reduction in the forecast for the euro area's trade balance. The pace of employment growth is also expected to moderate. This box discusses the main drivers of expected growth in 2019 and the revisions compared to the autumn forecast through the lens of a structural model.

The advantage of using a detailed structural model to decompose macroeconomic dynamics is that such models exploit the rich information provided by the data. In particular, models allow 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 demand and supply shocks⁽¹⁾ is determined by their ability to fit not only GDP, but also other observed variables (and their co-movement), such as consumption, investment, trade and employment.

The analysis builds on the Global Multi-Country Model, which is a macroeconomic model in the New-Keynesian tradition with micro foundations derived from utility and profit maximisation by households and firms respectively, featuring frictions in goods, labour and financial markets.⁽²⁾ The analysis uses a configuration with two regions, the euro area and the rest of the world (RoW), which has been estimated using quarterly data for the period from 1999-Q1 to 2018-Q4. The estimation of the model identifies the shocks, inspection of which provides an interpretation of the data from the perspective of economic theory.

⁽¹⁾ The exogenous factors that drive the short- and medium-term deviations of endogenous variables (including GDP, inflation, domestic demand, and trade) from their long-run trend paths.

⁽²⁾ The Global Multi-Country (GM) DSGE model has been 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*.

Model-based analysis of forecast drivers

The analysis proceeds in three steps. First, the model is estimated on historical data. Second, the time series are extended by the European Commission's forecast for 2019 for the set of available variables. In the third step, the shocks that are necessary for the model to fit the forecast given the estimated model parameters are recovered. A comparison of the model-implied shocks across the different forecast vintages provides information on the drivers behind the forecast revisions.⁽³⁾

The large number of shocks (the model includes 36 types which reflect the rich dataset) are summarised into seven groups of drivers, 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) domestic demand shocks, i.e. changes in euro area consumption and investment demand that are not explained by fundamentals such as household income, interest rates and return expectations on capital and financial assets, and discretionary changes to fiscal policy; (5) euro area monetary policy shocks that capture deviations of short-term interest rates from the estimated policy rule; (6) exchange rate shocks, which affect the euro exchange rate independently of the monetary policy stance; and (7) shocks to world demand and international trade, including foreign demand and supply shocks and deviations of trade from the estimated demand and pricing equations. The remaining shocks and effects of initial conditions are summarised in 'others'. The model-based decompositions in the following sections identify the importance of each of these groups of shocks.

The GDP growth slowdown in 2019 is driven by demand factors...

Graph 1 provides the model-based decomposition of annual real GDP growth. The solid black line depicts the historical data, and the dashed line represents the European Commission's forecast for 2019. The coloured bars indicate the contribution of the driving forces to deviations of GDP growth from its long-run trend of 1.3%.⁽⁴⁾ Bars above (below) long-run growth indicate positive

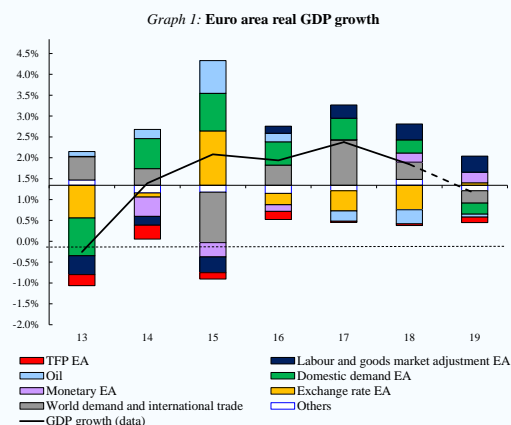
⁽³⁾ It should be noted that differences in identified shocks between two forecast vintages can result from the forecast revision itself, but also from revisions in historical data between two vintages.

⁽⁴⁾ Trend growth of real GDP is determined by trend productivity and trend labour force growth.

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Box (continued)

(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 and the forecast (dashed line) for 2019. The trend line illustrates that expected GDP growth is below trend growth in the forecast for 2019.

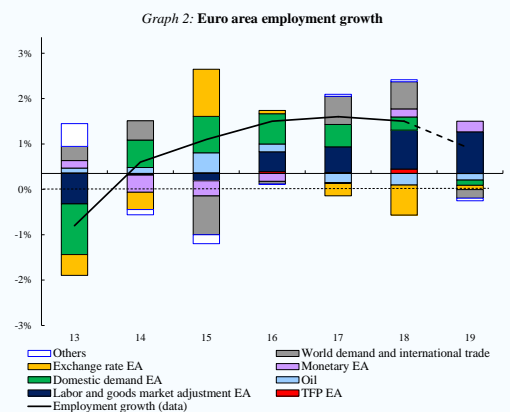


The decomposition of real GDP growth points to world demand and international trade as a key driver of the growth slowdown between 2018 and 2019. Its contribution to annual GDP growth changes markedly (-0.7 pps.) between the two years. Domestic demand shocks become a dragging factor of similar size (-0.6 pps.). The contributions to deviations from trend growth move from positive in 2018 to negative in 2019 for both drivers. The shift in the contribution of foreign factors is dominated by a slowdown in trade associated with slowing growth in euro area export markets and some market share losses. The main component in the slowdown of domestic demand growth is a slowdown in investment growth. According to the model's estimated shocks, however, the decline in export growth and investment is not exceptional by historical standards and points to a rather cyclical, temporary, impact on economic activity in the euro area.

On the upside, the negative growth contribution from the euro's appreciation in 2018 abates in 2019, for which the forecast assumptions display a moderate depreciation against major currencies. The negative contribution from oil prices also diminishes in 2019, as the forecast assumption incorporates little price change after significant oil price increases in 2018. The model identifies a persistently positive and slightly strengthening contribution to growth from monetary policy, which remains expansionary compared to the estimated monetary policy rule in the model. Moderate wage growth in combination with falling

unemployment, which the model explains by favourable labour supply shocks, contributes positively to real GDP growth through positive employment effects, but without further strengthening between 2018 and 2019.

The outlook for the labour market, however, shows employment growth in the euro area slowing less than real GDP growth. Importantly, employment continues to grow faster than the labour force, leading to a decline in the rate of unemployment. Real wage and labour cost growth are, furthermore, expected to remain unchanged or to slow slightly despite the projected decline in unemployment. The combination of falling unemployment and constant wage growth is interpreted by the model as a result of positive adjustment on the supply side of the labour market, leading to wage moderation (Graph 2).



The downward revision of expected real GDP growth in 2019 by 0.7 pps. compared to the 2018 autumn forecast is the result of a few factors. Actual euro area real GDP growth for 2018 was by 0.2 pps. lower than expected in the autumn, primarily due to a weaker contribution from domestic demand and external trade. Contrary to the present forecast, the 2018 autumn forecast included stronger growth in private consumption and did not incorporate the pronounced trade slowdown present in the current assessment. Investment demand and productivity growth have also seen a downward revision in the current forecast. All these elements are temporary factors affecting GDP growth. The long-term trend component of euro area growth in 2019 has remained unchanged.

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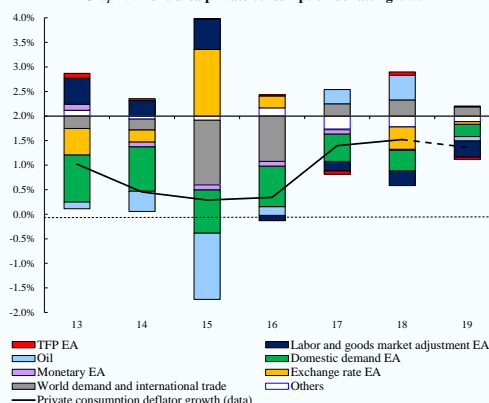
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...which play a secondary role in changes in inflation...

Inflation, as measured by the annual growth of the private consumption deflator, is forecast to slow slightly to 1.4% in 2019 from 1.5% in 2018 (Graph 3). The outlook for changes in private consumption price inflation between 2018 and 2019 is dominated by the outlook for oil prices. Given the important weight of fuel and energy in the consumption basket, transmission of oil price shocks to the private consumption deflator is strong and immediate. After increasing by 31% in 2018, oil prices in USD are assumed to fall moderately in 2019. Hence, the inflationary effect of oil price shocks in 2018 disappears in 2019. The change in the oil price assumption alone reduces inflation by -0.6 pps. in 2019 compared to 2018. The anti-inflationary impact of exchange rate shocks in 2018 diminishes the inflation outlook for 2019 as the effective appreciation of the euro in 2018 gives way to mild depreciation in 2019, although previous appreciation still affects inflation through the persistence in the production cost channel to some extent.

International trade contributes to the slowdown in inflation through a slowing of euro area import price growth. The slowdown of export growth, which is an important factor behind weakening GDP growth, has little immediate impact on consumer price inflation, due to the limited sensitivity of prices to activity in the short term. Instead, the contribution of exports to activity remains above its long-term average, which explains why the overall contribution of trade and world demand to inflation is still positive. Domestic demand continues to weigh negatively on the inflation outlook, but its negative effect does not increase in 2019 because inflation responds sluggishly to economic activity. Wage moderation, inferred from low wage growth despite positive employment dynamics, continues to dampen inflation in 2019.

Graph 3: Euro area private consumption deflator growth



Compared to the AF 2018 forecast, the current expectations for inflation are lower by 0.3 pps. The main factor behind the revision is a change in the oil price assumption, where the AF 2018 was based on a stronger and sustained price increase, complemented by upward pressure from stronger foreign and domestic demand.

...but affect the trade balance.

The euro area's net exports of goods and services remain in surplus, but are forecast to decline from 4.0% of GDP in 2018 to 3.8% of GDP in 2019. The major driver of the decline in the trade surplus is the negative impact of the euro's depreciation on the terms of trade and the slowdown of world and export demand (counteracted in this group by a decline in import prices), whereas oil price developments raise net exports compared to 2018 by reducing the import bill.

Graph 4: Euro area trade balance (as a percentage of GDP)

