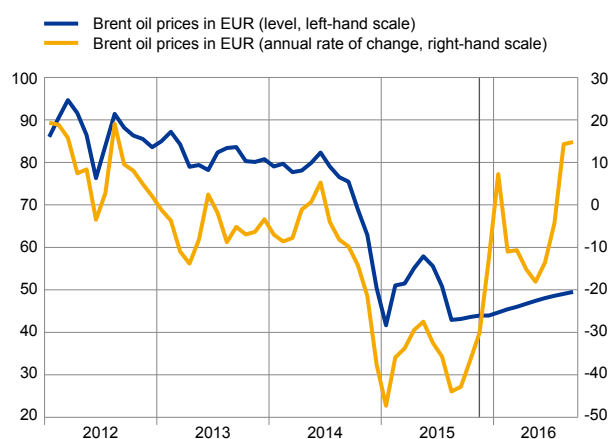


Box 3

The role of base effects in the projected path of HICP inflation

Chart A
Oil prices: actual and futures

(annual percentage changes and EUR/barrel)

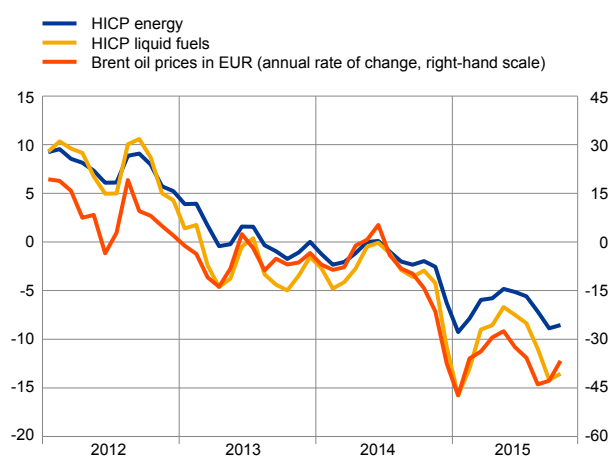


Sources: Bloomberg and ECB calculations.

Note: The vertical line separates actual data from futures and refers to 12 November 2015, the cut-off date for the assumptions of the "December 2015 Eurosystem staff macroeconomic projections for the euro area".

Chart B
Oil prices and energy inflation

(annual percentage changes, monthly data)



Sources: Bloomberg, Eurostat and ECB calculations.

Base effects will have a strong impact on the projected path for headline HICP inflation in the short term. The December 2015 Eurosystem staff macroeconomic projections for the euro area imply a significant increase in HICP inflation at the turn of the year followed by a temporary moderation until the middle of 2016.¹ This profile essentially reflects the impact of base effects on the annual rate of change in energy prices, which is the most volatile component of HICP inflation.

Oil prices have shown strong swings since the middle of 2014 which will be reflected in the annual rate of change assuming a smooth path of oil prices in the period ahead. Oil prices fell from mid-2014 to January 2015 and, after a temporary rebound between February and May 2015, have again been on a downward path since June 2015 (see Chart A). Looking ahead, the curve of oil futures prices is relatively smooth with a moderate upward slope.² This implies that, if oil prices follow the envisaged path of the futures, the expected profile of annual rates of energy inflation will mainly reflect past swings in oil prices. The pattern of the annual growth rate in oil (and energy) prices is thus driven by base effects, i.e. "atypical" month-on-month movements in the energy price index 12 months earlier. In the absence of strong movements in taxes and refining and distribution margins, developments in the price of crude oil expressed in euro translate relatively completely into corresponding developments in consumer fuel prices (which account for the largest part of consumer energy prices) and thus into overall energy prices (see Chart B).

Quantifying base effects implies some uncertainty. There is no single way of quantifying the impact of an "atypical" month-on-month price change that occurred

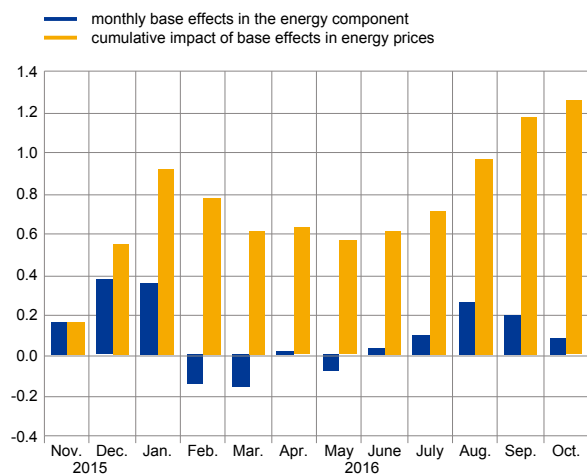
¹ See the article entitled "December 2015 Eurosystem staff macroeconomic projections for the euro area", published on the ECB's website on 3 December 2015.

² For the conversion of US dollar oil futures prices into euro, the USD/EUR exchange rate is assumed to remain unchanged at the average level observed in the two weeks ending 12 November 2015 (i.e. the cut-off date for the December 2015 Eurosystem staff macroeconomic projections for the euro area).

Chart C

Base effects stemming from energy prices

(percentage point contributions to change in headline HICP inflation)



Source: ECB calculations.

12 months previously on the change to the year-on-year inflation rate. In past analyses reported in the ECB's Bulletin, this impact has been computed for each month by subtracting the actual month-on-month movement from an estimated seasonal effect and a "trend", namely the average month-on-month change observed since the mid-1990s.³ In the case of energy inflation, where the series does not show stable seasonal effects, this boils down to a simple comparison with the trend (which reflects the impact of the long-term rise in oil prices). The swings in oil prices since autumn 2014 imply large positive base effects at the turn of the year 2015/16 followed by an alternation of negative and positive base effects which will shape the expected energy inflation pattern and thus HICP inflation over the coming 12 months (see Chart C), assuming that oil prices follow the envisaged path of the futures. The cumulative impact from base effects in energy inflation on overall HICP inflation amounts to approximately 1.3 percentage

points from November 2015 until October 2016. The estimate of this impact is somewhat lower when assuming that there is no trend in oil prices (i.e. in the order of 0.9 percentage point over the coming 12 months).⁴

Overall, the pattern of headline HICP inflation projected over the next 12 months is largely determined by base effects stemming from the energy component.

These base effects imply a strong increase in inflation until January 2016 and a small temporary decline in the first half of 2016, assuming that oil prices actually follow the path envisaged by the futures.

³ See, for instance, the box entitled "Base effects from the volatile components of the HICP and their impact on HICP inflation in 2014", *Monthly Bulletin*, ECB, February 2014. The trend amounts to about 0.3 percentage point.

⁴ As would also be the case when looking at the usually rather flat curve of futures oil prices.