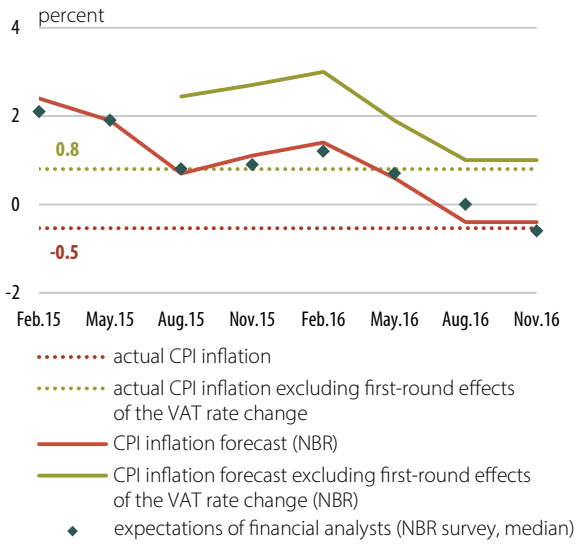
Assessment of forecast errors for the December 2016 annual CPI inflation

Given the essentially prospective nature of monetary policy decisions, warranted by the inherent time lags in central bank's decisions working their way through the economy, macroeconomic forecasts play a pivotal part in the inflation targeting strategy. With a view to improving the forecasting framework, the assessment of forecast errors is a common practice among central banks with such a monetary policy regime in place[1]. In this context, during 2016, the NBR staff further assessed the accuracy of forecasts the central bank had made in successive rounds relative to the annual CPI inflation rate for end-2016[2]. The analysis showed both the prevalent contribution to the forecast error made by inflation components exogenous to the monetary policy scope, and the importance of the global disinflationary factor in the repeated revisions of inflation projections.

The annual CPI inflation rate for December 2016 (-0.5 percent, according to NIS Press Release No. 20 of 13 January 2017) was overestimated[3] in all eight rounds under review, with forecast errors ranging between a +0.2 percentage point low (in the November 2016 *Inflation Report*) and a +2.9 percentage point high (in the February 2015 *Inflation Report*). In terms of accuracy, the size of these errors is similar to the median of those arising from financial analysts' forecasts (taken from the NBR survey on inflation expectations). In order to ensure comparability, the forecasts considered for analysis were those released by financial analysts in the months when *Inflation Reports* were published (Chart A).

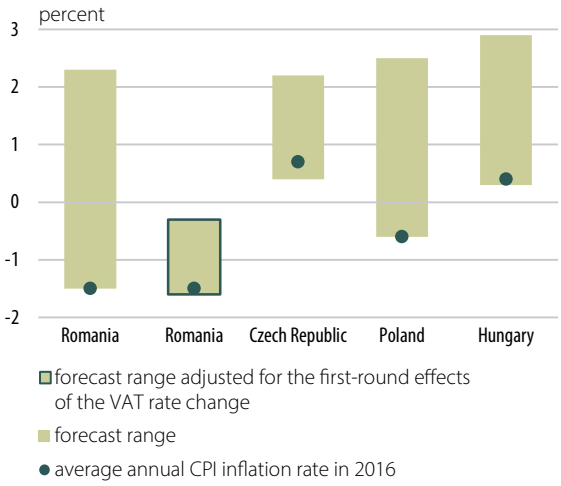
The 2016 actual average annual inflation rate stood at the lower bound of the range defined by the successively projected values of the indicator (Chart B). This owed to a number of favourable supply-side shocks having occurred in the region

Chart A. Successive forecasts of annual CPI inflation rate for December 2016



Source: NIS, NBR projections, NBR survey

Chart B. Revisions of the forecasts on 2016 average annual CPI inflation made by some central banks in Central and Eastern Europe



Source: NBR, CNB, NBP, MNB

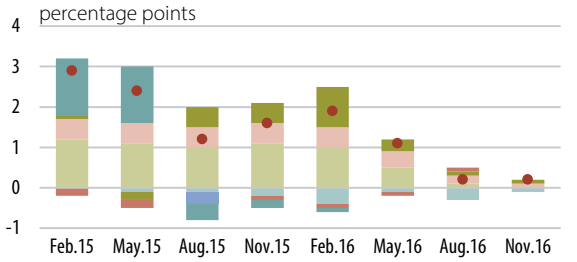
1 Assessments are made either regularly, namely on an annual basis (e.g. Magyar Nemzeti Bank, Sveriges Riksbank) or occasionally, covering a longer period of time (e.g. Česká národní banka, Bank of England).

2 Based on this criterion, the considered forecasting rounds correspond to the *Inflation Reports* published February 2015 through November 2016.

3 The forecast errors are calculated as the difference between the successively forecasted values and the actual one. A negative difference implies that the projection underestimated the actual CPI inflation rate, whereas a positive difference reveals its overestimation.

and/or worldwide (significant falls in the international commodity prices, the persistent oversupply in the EU agri-food market following Russia's ban), along with a slow recovery of effective external demand in the post-crisis period. At the same time, the fiscal measures implemented over the last two years referring to indirect tax cuts, especially the value added tax (VAT)[4], acted also towards lowering the average inflation rate both in Romania and in the other countries under review.

Chart C. Forecast errors in successive rounds, by contribution of CPI components



- first-round effects of VAT rate change/assumption of VAT rate change pass-through
- excise duty on fuels
- tobacco products and alcoholic beverages excl. the first-round effects of the VAT rate change
- adjusted CORE2 excl. the first-round effects of the VAT rate change
- VFE prices
- fuels excl. the first-round effects of change in VAT rate and in excise duty
- administered prices excl. the first-round effects of the VAT rate change
- CPI inflation forecast error (Dec./Dec.)

Source: NBR calculations

For Romania, the breakdown of forecast errors for end-2016 (Chart C) reveals the important contribution of the CPI basket sub-components directly hit by the mentioned exogenous shocks (volatile food prices[5], adjusted CORE2 index[6]). The prevalent contribution is, however, associated with the dynamics of administered prices. Their current path incorporates the most recent legislative changes in the field targeting especially prices of electricity and natural gas (revisions of regulated electricity tariffs and of competitive market component prices, deviations from the calendar on the deregulation of the end-user price for domestically-produced natural gas, mirroring inter alia international developments[7]).

In spite of the successive downward revisions of the Brent oil price, the annual dynamics of fuel prices were, contrary to apparent expectations, underestimated over the forecasting rounds, following specific developments at the end of the previous year (crude oil prices resuming notable annual growth rates amid the agreement among OPEC and non-OPEC member countries to contain production; the depreciation of the leu against the US dollar).

In the February 2015 and May 2015 projection rounds, an important source of the forecast errors for both CPI inflation and core inflation was the effect – that could not be anticipated back then – of the measure to cut, starting January 2016, the standard VAT rate from 24 percent to 20 percent, also with an impact on the paths of inflation expectations through which the second-round effects of the measure are passed on.

4 In Romania, the standard VAT rate was cut from 24 percent to 20 percent starting 1 January 2016. Moreover, all four countries subject to the analysis adopted measures for broadening the scope of the reduced VAT rate to a series of product categories in the period under review.

5 The slow dynamics of volatile food prices at the end of the previous year owed also to an agricultural production that exceeded the long-term average (except for the maize harvest). The standard assumption underlying the forecast refers to normal agricultural years domestically (as compared to the multi-annual average output).

6 For instance, this component was affected by significant drops in the prices of agri-food commodities, which had an impact on production costs incurred by local companies.

7 For further details see the Romanian Energy Regulatory Authority press releases of 30 March 2016, 23 June 2016 and 30 June 2016, respectively, available at http://www.anre.ro/ro/presa/comunicate (Romanian only).

Compared to the provisions of the Tax Code version used for mapping out the August 2015 projection (referring mainly to the standard VAT rate cut from 24 percent to 19 percent and to the lowering of the excise duties on fuels as of January 2016), the subsequent changes thereof (producing a more notable impact on the CPI inflation rate forecast), incorporated in the projection starting with the November 2015 forecasting round, envisaged a one-year delay (from 1 January 2016 to 1 January 2017) in implementing the 1 percentage point reduction in the standard VAT rate and in scrapping the special excise duty on fuels.