Box 2. Re-assessing output gap following the revision of the historical GDP series

The output gap is a synthetic measure of the gap between aggregate demand and supply in the economy, assessed as the difference between actual GDP (reflecting short-term developments in aggregate demand) and potential GDP (showing long-term developments in aggregate supply)[1]. The output gap estimation is directly influenced by developments in the statistical data series, a pivotal role being attributed to the dynamics of the seasonally adjusted real GDP.

With the publication of the flash estimates on GDP dynamics in 2017 Q4[2], the NIS announced that the seasonally adjusted quarterly GDP series had been recalculated. Based on the information made available by the NIS release, GDP and its related components had been recalculated in the context of:

– the revision of unadjusted quarterly GDP series for 2007-2012 with a view to reconciling them with the revised annual data to reflect the implementation of the methodological changes on the treatment of Eurostat reservations regarding the gross national income;

– the revision of unadjusted quarterly GDP series for 2015-2016 with a view to reconciling them with the annual data (2015 – final version, 2016 – semi-final version);

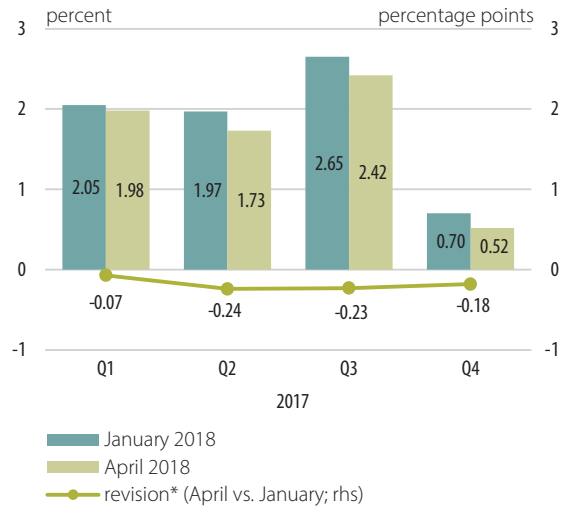
– the incorporation of estimates for 2017 Q4.

Chart A shows the annual economic growth for 2007-2012 based on the data released in January 2018[3], featured in the baseline scenario in the February 2018 *Inflation Report*, and on the data released in April 2018[4], featured in the present *Report*. Recent data show that the economic contraction recorded in 2009 was slightly lower, while during 2010, GDP posted a steeper decline.

Chart A. Economic growth

Source: NIS

Chart B. Quarterly GDP growth



*) For January 2018 data, 2017 Q4 shows the short-term forecast used in the previous round.

Source: NIS, NBR

1 For details on the output gap definition and the estimation methods employed by the NBR, see Box "Output gap: definition and estimation methods" in the NBR *Annual Report* 2016 and article "Evaluarea deviației PIB în cadrul BNR" (http://www.opiniibnr.ro/index.php/macroeconomie/271-evaluarea-deviatiei-pib-in-cadrul-bnr).

2 NIS Press Release No. 44 of 14 February 2018.

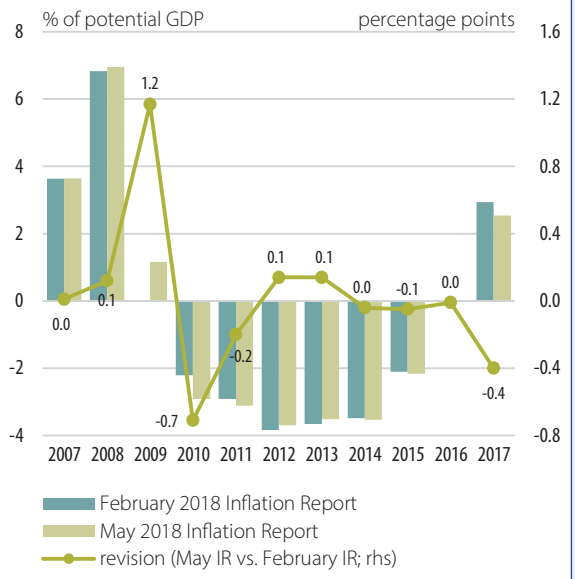
3 NIS Press Release No. 16 of 12 January 2018.

4 NIS Press Release No. 84 of 5 April 2018.

Subsequently, in 2011 and 2012, economic growth was higher, being revised at rates almost double the previously reported values.

The changes made to the unadjusted GDP series reflected also in revisions of the seasonally adjusted series, of which the most relevant for the current output gap assessment occurred in the course of 2017 (Chart B). The systematic downward revisions of the GDP dynamics in the first three quarters of 2017 added to a slight overestimation of the dynamics for 2017 Q4 in the previous round, following, inter alia, more favourable previous historical data.

Chart C. Output gap



Source: NBR assessments based on data provided by the NIS

Chart C shows the output gap re-assessment compared to the previous forecasting round for 2007-2017. The revisions made to the seasonally adjusted real GDP series generally reflected also in the output gap re-assessment. For 2011-2013, the economic growth revision was largely incorporated into potential GPD growth, given that, looking at GDP components, GFCF made a more favourable contribution, also reflected in a higher capital stock. Compared to the previous round, for 2017, output gap was revised downwards by 0.4 percentage points (from 2.9 percent to 2.5 percent). The re-assessment of the output gap is based on: (i) the revision of the historical series and the forecast error in the previous round, accounting for about one quarter of the total revision; (ii) the reconsidered size of the bumper crop effect that occurred mainly in 2017 Q3, amounting to around 0.2 percentage points and (iii) the impact of updating the other drivers. The downward revision of the output gap during the historical interval leads to a downward revision of the projected output gap too.

Considering the unobservable nature of the output gap, its estimation, especially in real time and in the context of the frequent revisions of the primary data series, features a high degree of uncertainty and is inherently likely to undergo subsequent revisions[5].

5 See NBR *Occasional Paper* No. 15/2015, "Modelling Statistical Data Uncertainty in the Context of Historical Revisions" for a quantitative assessment of the uncertainty surrounding the historical revisions of the quarterly growth of real GDP.