

Executive summary – Accuracy of forecast of macroeconomic and budgetary data

In accordance with the tasks conferred to it under article 8, point b), of the law of 12 July 2014 on the coordination and governance of public finances, as amended (law of 12 July 2014, as amended), **the National Council of Public Finance (CNFP) presents its assessment of the accuracy of forecast of macroeconomic and budgetary data based on objective criteria.** Forecast data are from the “Notes de Conjoncture” (NDC) issued on a semi-annual basis (spring and autumn) by STATEC. However, it should be noted that the budgetary forecasts from the NDC have been established by the “National Economic and Financial Committee”.

Pursuant to the new article 8bis of the law of 12 July 2014, as amended, the CNFP analyses whether the assessment detects a significant bias affecting macroeconomic forecasts. The assessment of the presence of a significant bias is also carried out for budgetary forecasts. The CNFP notes, however, that the law of 12 July 2014, as amended, does not provide for any actions in the event of a significant bias in budgetary forecasts, in contrast to the procedure defined for macroeconomic forecasts, which requires STATEC to take the necessary actions and to make them public.

Noting that there is no national or European definition of “significant bias affecting forecasts”, the CNFP reports a “significant bias affecting forecasts” when the statistical tests indicate a significant statistical bias (i.e., a systematic under- or overestimation) in the forecasts.

The CNFP emphasizes that due to the short time horizon of the analysis of the accuracy of forecast (annual data over a period of 10 to 20 years), the power of the statistical tests, carried out by the CNFP to detect a “significant bias”, is relatively low. For this reason, the statistical tests are always preceded by an in-depth graphical analysis of forecast errors and followed by a comparison of STATEC’s performance at the European level and an analysis of the subsequent revisions of observations.

The result of the analysis of the accuracy of forecast of macroeconomic and budgetary data is divided into subgroups of variables:

- Real GDP growth (data available from 1996 to 2016);
- Employment growth and unemployment (data available from 1996 to 2016);
- Inflation (data available from 2006 to 2016);
- Nominal balance of general government (data available from 2006 to 2016).

➤ **Real GDP growth**

The CNFP notes that periods of underestimation alternate with periods of overestimation and that the mean forecast error (i.e., the average of the difference between the observations made ex post and the forecasts for a given time period) of the real growth is close to zero over the 1996 to 2016 period, suggesting that there is no systematic under- or overestimation. Statistical tests also do not indicate any statistical bias in the real growth forecasts.

Concerning the mean absolute forecast error of the real growth rate (which reveals the absolute difference between the observations made ex post and the forecasts of real growth rate), the CNFP notes that it is gradually decreasing for forecasts established closer to their target date. In addition, the CNFP notes that

the mean absolute forecast error of the real growth rate of STATEC is lower than the mean absolute forecast error that would have been produced by a first order autoregressive model, i.e. a regression model in which the projected growth is explained by its own past values rather than by other variables.

The CNFP also observes that STATEC's performance is comparable to the European Commission (EC) performance of forecasting the real growth rate for Luxembourg. In addition, taking into account the volatility of the respective economies (measured by the standard deviation of the real growth rate), the forecast performance for Luxembourg is comparable to that of its neighbours (Belgium, Germany, France).

Finally, the CNFP analyses the subsequent revisions of real growth rate observations. The statistical tests show significant upward revisions to real growth in autumn "t+3" and in autumn "t+4".

➤ **Employment and unemployment**

The assessment does not reveal a significant bias affecting unemployment rate forecasts. In contrast, employment growth forecasts are significantly biased over the 1996 to 2016 period. Indeed, the statistical tests indicate a significant underestimation of the employment growth rate (between 0.3 percentage point for forecasts in autumn "t" and 1.0 percentage point for forecasts in autumn "t-1").

The CNFP also notes that employment growth forecasts based on a first order autoregressive model would have been more accurate for the period under consideration (2008 to 2016) than the forecasts made by STATEC in spring and in autumn "t-1". On the other hand, the EC's employment growth forecasts do not show a better performance than those produced by STATEC.

➤ **Inflation**

The assessment does not reveal a significant bias affecting NICP (National index of consumer prices) and GDP deflator forecasts over the 2006 to 2016 period. However, the CNFP notes a relatively high mean absolute forecast error for the GDP deflator, even for forecasts close to the observation date. In addition, the CNFP observes that the mean absolute forecast error of Luxembourg's GDP deflator is on average 1.4 percentage point higher than that of neighbouring countries.

➤ **Nominal budget balance of the general government**

The CNFP notes that the nominal budget balances of the general government observed over the last 10 years are significantly higher than previously estimated. Indeed, over the 2006 to 2016 period, the nominal budget balance was underestimated by an average of €712 million in autumn "t-1" and €349 million in autumn "t". The statistical tests indicate significant underestimations of the nominal budget balance forecasts.

The CNFP also observes that forecasts based on a first-order autoregressive model would have been more accurate over the period under consideration than the nominal budget balance forecasts established by STATEC (for forecasts dating before autumn "t").

The results are globally consistent with those of STATEC's own evaluation of forecasting performance published in the November 2016 NDC.