

Extensive summary of CPB Document 178, *Accuracy of short-term forecasts 1971-2007*

This report analyses the accuracy of short-term economic forecasts made by the CPB. The years 1971-2007 are taken into account. The main focus is on GDP growth, but a number of other variables are analyzed as well. After this analysis, we discuss the sources of prediction errors. Next, the performance of the CPB is brought into perspective by comparing its forecasts for Dutch GDP growth to those of other, both national and international, institutes. The final section discusses the way CPB presents the uncertainty that unavoidably surrounds its forecasts.

A set of indicators is presented to illustrate the forecast accuracy of CPB outlooks for GDP growth. The average forecast error of next year's growth, during the period 1971-2007, turns out to be equal to zero. Current year's GDP growth was, on average, underestimated by 0,3%-point. However, a small average error can be the result of over- and underestimations cancelling out. The average *absolute* forecast error corrects for this. This indicator declines from 1.2%-point in the autumn-forecast for the next year to 0.7%-point in the autumn-forecast of GDP-growth in the current year. Other indicators of forecast accuracy that are investigated include the Root Mean Squared Error, the R^2 and the Theil coefficient. Furthermore, some statistical tests on the existence of a bias and on efficiency are carried out. The main message from these tests is that there is neither evidence of a bias, nor of inefficiency, in CPB forecasts. Statistical analysis also shows that there is no relation between subsequent forecast adjustments.

Other economic variables that are examined in this report include relevant world trade, household consumption, contractual wages and the consumer price index, among others. For all variables under investigation, it holds true that the average forecast error, in the autumn forecast for next year, during the years 1971-2007, lies somewhere in the interval -0.4 to 0.6%-point. Average absolute forecast errors are obviously higher. In general, the predictions of the development of variables depending most on foreign developments, such as exports, are the least accurate. Business investments turn out to be difficult to predict as well. But most problematic of all is the estimation of consumption growth in the upcoming year, according to a Theil coefficient of 1.0.

What are the causes of the forecast errors? Four sources of error can be distinguished. The single most important source of uncertainty concerns the assumptions about the international developments. Especially the development of relevant world trade is a very important factor in making forecasts for the Dutch economy. However, this is not only very difficult to forecast in itself, but it is also influenced by unforeseeable events, such as terrorist attacks or the flaring up of geopolitical tensions. In the end, about three quarters of the average prediction error of GDP growth can be explained by premises about so-called exogenous variables, differing from what eventually happened in reality, while this contribution is even as high as 90% for the forecasts of prices and volumes of the export of goods. Next, adjustments of the National accounts by Statistics Netherlands influence the accuracy of CPB forecasts. This implies that,

while making the outlook, the wrong realisations from the past were used. Via 'carry over'-effects, this affects the forecast quality. The third source of uncertainty is the macro econometric model used. Parameters are estimated and therefore intrinsically uncertain. Furthermore, they are based on the past and it is not always obvious that relations from the past still hold for the future. And, of course, a model is just a stylization of reality, which means it cannot grasp every observed detail. Fourth and final, so-called 'expert-opinion' affects the quality of predictions. Sometimes, model outcomes are adjusted on the basis of insights of specialists, for example by making use of the most recent information. The development of contractual wages is such a variable that is often adjusted, because part of this development is tied down in an early stadium as a result of collective labour agreements.

A comparison of CPB forecasts for Dutch economic growth with forecasts of other institutes learns that differences are small. None of the forecasters outperforms the others on all indicators in the years 1998-2007. When the mean absolute error of the prediction for the current year is considered, the European Commission and the OECD perform worse than average. This reflects their disadvantage in having a long forecasting process, while lacking specific information concerning the Dutch economy. The differences are even smaller when the forecast for the next year is evaluated. Given the large uncertainties, this is remarkable. Perhaps forecasting institutes simply look more at each other when preparing next year's forecast, just *because* uncertainties are very large. Looking at the ability to predict slowdowns or accelerations in economic growth, it turns out that the CPB is the only institute to do so correctly in over 50% of the cases.

It is important to stress, however, that the main goal of the CPB is to provide a useful and well founded view on the direction the Dutch economy is heading, given some assumptions, rather than merely producing to-the-digit accurate forecasts for economic growth and other variables. This is what policy makers need. The CPB can offer forecasts with a good underpinning, but giving certainty about the development of the economy is an illusion. Economics is not physics. It is, for example, impossible to say with certainty what the dollar exchange rate, the oil price or the growth rate of relevant world trade will be in the future. These variables have a large impact on the accuracy of forecasts.

An average prediction error of about zero for most variables, which the CPB manages to achieve, is quite unique from an international perspective. That is, the IMF, OECD and European Commission have a bias of tenths of percentage points or even more in their forecasts for many countries and regions. Nevertheless, the mean absolute errors of CPB forecasts are of comparable magnitude as those from other institutes. A possible explanation for this is the simple fact that the Netherlands is a small, open economy depending heavily on the difficult to forecast outside world.

This report concludes by evaluating possible ways for improving forecasts and by explaining how the CPB handles uncertainty in the presentation of its results. Forecasts, obviously, would benefit from a better

projection of developments in the international environment, although this simply is not feasible to a large extent . The macro model should be kept up to date and improved where possible, for example when new data have become available or when new theoretical insights have been developed. Complementing this, more and more use has been and will be made of so-called leading indicators and VAR-analyses to find out if adjustment of the model outcomes is desirable. However, uncertainty is and always will be part of economic life. For that reason, the CPB presents uncertainty variants in addition to the central projection almost always. These variants enable the CPB to show what would happen in case certain risks become reality.