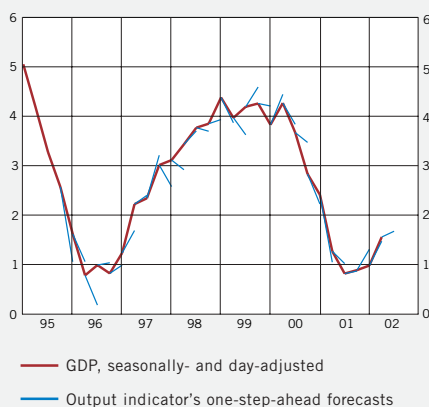


## A MODEL FOR INDICATING QUARTERLY OUTPUT CHANGES

**Figure B7. The indicator's historical forecasts together with seasonally- and day-adjusted GDP.**

Percentage annual change



Sources: Statistics Sweden and the Riksbank.

The preliminary quarterly national accounts for Sweden are usually published with a time lag of more than two months. One way of assessing the state of the economy sooner is to use the information that is published on a monthly basis. With these statistics, economic activity in the most recent quarter can be predicted. A model for GDP changes that uses monthly data on manufacturing output, retail turnover and hours worked in public authorities as explanatory variables is described briefly here.<sup>3</sup> The choice of variables is motivated by how GDP is calculated from the output side. In order to catch GDP rigidity, the model uses the previous quarter's GDP observation.<sup>4</sup>

### ESTIMATION AND FORECASTING CHARACTERISTICS

The output indicator has been estimated with the least squares method on data for 1990 Q1 onwards. The one-step-ahead forecasts obtained with the model outside the sample have been evaluated for the period 1996 Q1 to 2002 Q2. The results are presented in Fig. B7.

The deviation in the output indicator's one-step-ahead forecasts from the GDP outcome has generally been small. Compared with other simple predictive models, such as a naive forecast (no change from the previous quarter) or a forecast based on GDP's unconditional mean, the mean square error of the indicator is small.

A characteristic of a good GDP indicator is its ability to predict the direction of the next quarter's change in GDP. For the 26 periods (1996 Q1 to 2002 Q2) for which the direction of the output indicator's predictions has been studied, the model misjudged the direction six times and judged correctly 20 times. In other words, the model judged the direction of the change correctly in 77 per cent of the cases.

For 2002 Q3, the output indicator predicts a GDP growth rate of 1.7 per cent in annual terms, which is 0.1 percentage point higher than the prediction for Q2.

3 The data on hours worked are published sooner than the figures on manufacturing output and retail turnover. In order to obtain the forecast even earlier, manufacturing output and retail turnover in the third month of the quarter can be based on business tendency data (from the National Institute of Economic Research) and a quick index (from the Research Institute of Trade), respectively. The indicator is then available about one month earlier than when the corresponding indicator model is strictly based on monthly statistics or on Statistics Sweden's activity index.

4 Estimated on the whole of the period from 1990 Q1 to 2002 Q2, the output indicator gives the following result:

$$\Delta RNP_t = 3.31 \times 10^{-4} + 0.146 \Delta TP_t + 0.133 \Delta OMS_t^0 + 0.0998 \Delta AT_t^{eff} + 0.499 \Delta RNP_{t-1} + \varepsilon_t$$

(7.36x10<sup>-5</sup>)      (0.0310)      (0.0438)      (0.0744)      (0.0941)

where the variables on the right-hand side are constructed as the sum of each quarter's monthly observations. The figures in parentheses are the standard error of the coefficient.