Economic Commentaries

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**This Economic Commentary updates the assessment of GDP forecasts presented in the material for assessing monetary policy published by the Riksbank in connection with the first Monetary Policy Report of this year. The results of the assessment show that all of the forecasters examined made substantial errors with regard to GDP growth in 2008. The Riksbank's forecasting accuracy was slightly better than the average of all forecasters.**

# The accuracy of different analysts' forecasts for GDP in 2008

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## The Riksbank analyses monetary policy and forecasts in an annual report

Every year the Riksbank publishes material to use as a base for the Riksdag Committee on Finance's assessment of monetary policy.[2] An important component of an assessment of monetary policy is an analysis of the accuracy of the forecasts published. In the material for assessing monetary policy the Riksbank's published forecasts are compared with forecasts made by other professional economic analysts. The variables that are assessed are GDP growth, CPI inflation and unemployment. It is primarily the forecasts for developments in 2008 made in 2007 and 2008 that are assessed. The results show that the Riksbank's forecasts have had a good standard of accuracy compared with other forecasters, but also that all forecasters made many forecast errors. However, the analysis of the GDP forecasts was limited by the fact that Statistics Sweden had not yet published the National Accounts for the fourth quarter of 2008 when the material was published. This meant that the outcome for GDP growth in 2008 was not available. The data for GDP growth in 2008 which was used instead in the material published was the Riksbank's forecast from February 2009. Since then the National Accounts for the fourth quarter have been published, which now enables an assessment of the whole year 2008. This Economic Commentary thus aims to update the assessment of the forecasts with a correct analysis of GDP growth in 2008.

## Swedish economy shrank in 2008

Swedish GDP fell by 4.9 per cent (calendar-adjusted) in the fourth quarter of 2008, compared with the corresponding quarter in 2007, which is the weakest rate of change since the first quarter of 1993. The Riksbank's forecast in February 2009 was that GDP would fall by 1.1 per cent. The observed growth rate in the final quarter of last year means that the Swedish economy shrank by 0.2 per cent in 2008. However, it was assumed in the material for assessing monetary policy that the outcome for the whole year would be 0.7 per cent.

Figure 1 shows the forecasts for GDP growth in 2008 made by various forecasters in 2007 and 2008. The Riksbank and other forecasters made roughly the same incorrect assessments of GDP growth in 2008.[3] None of the forecasters included in the assessment expected a fall in GDP growth in 2008. During most of 2007 the forecasters instead assumed that growth in 2008 would be around 3 percentage points higher than it was. Later, at the end of 2007, the forecasters began to revise down their growth forecasts and in December 2008 most of these forecasts were within the interval of 0.7 to 1.1 per cent.

[1] We would like to thank Mikael Apel, Joanna Gerwin, Jesper Hansson and Ulf Söderström for their comments on this article.
[2] See "Material for assessing monetary policy 2006-2008", Sveriges Riksbank, published on 16 February 2009.
[3] The analysis is based on data gathered by the National Institute of Economic Research and the Riksbank. One advantage of these data is that they show exactly when the forecasts were made. The forecast comparison includes the ten institutions assessed in "Material for assessing Monetary Policy 2006-2008": the Swedish Ministry of Finance (FD), the Swedish Retail Institute (HUI), the National Institute of Economic Research (KI), the Swedish Trade Union Confederation (LO), Nordea, SEB, Svenska Handelsbanken (SHB), the Confederation of Swedish Enterprise (SN), Swedbank and the Riksbank (RB).

## Assessment of GDP forecasts for 2008

It may be difficult to understand from Figure 1 how well the Riksbank has succeeded in forecasting developments in comparison with other forecasters. One means of obtaining a comprehensive measure of a forecaster's accuracy is to calculate the average forecast error, that is, calculate how much the forecasts have on average deviated from the outcome. This type of summarising measure can then be used for comparisons of different forecasting institutes, but it does not take into account the fact that the institutes publish their forecasts at different points in time. In practice, this means that the forecasters have access to different amounts of information (in the form of, for instance, outcomes, indicators and other agents' forecasts) when they make their forecasts, which means that it is not entirely fair to compare forecast errors directly. A forecaster that systematically publishes its forecasts after all of the others is expected on average to have a better accuracy than the other forecasters.

As with the analysis in the material for assessing monetary policy, the method used here is that of Andersson and Aranki (2009) for adjusting for the publication date of the forecast.[4] This involves using a statistical method to estimate how much of the forecast error of each forecaster can be explained by the length of the forecast horizon.[5] The remaining part of the forecast error, the part that does not depend on differences in the length of the forecast horizon, can then be used as a measure for a fairer comparison of different forecasters (see page 3 below for a technical description of the method).

Figure 2 shows the forecast error adjusted for differences in the forecast horizon with regard to the mean absolute forecasts solely for developments in 2008. The accuracy of the Riksbank's forecasts was comparatively good in 2008. However, all of the forecasters showed a low degree of precision. The Confederation of Swedish Enterprise had on average made the most accurate GDP forecasts for 2008, while the National Institute of Economic Research had made the least accurate.[6]

As the economy is constantly affected by different shocks that are difficult to foresee, the accuracy of the forecasts varies. For instance, a large forecast error may be due to a shock that was not possible to predict. An assessment of an individual year thus provides only limited information on the respective forecaster's forecasting ability. It is therefore more correct to compare the precision of different forecasters over a longer period of time. Figure 3 therefore shows adjusted mean absolute forecast errors for the period 1999–2008. The Riksbank's forecasts have been relatively good in this longer assessment period, too, but there is little difference between the various forecasters.

[4] See Andersson, M. K. and T. N. Aranki (2009), "A comparison of different forecasters' ability given the publication date effect", article to be published in Sveriges Riksbank Economic Review.
[5] The horizon effect is assumed to be common to all forecasters and the calculations have used absolute forecast errors to place underestimates and overestimates of the outcome on a par.
[6] In an article in the Dagens Industri newspaper published on 4 March 2009, The Swedish Confederation for Professional Employees (TCO) was said to be the best forecaster of GDP in 2008. However, TCO is not included in this study as it ceased publishing forecasts after December 2007. A substantial difference between this study and the assessment in Dagens Industri is that the assessment in this Economic Commentary analyses all forecasts made during the two years prior to the outcome being known. Dagens Industri, on the other hand, bases its assessment on only one observation, namely the forecast made immediately prior to 31 December 2007.

# A method of controlling for differences in the amount of information available to different forecasters – a technical description

Let $y_t$ be the outcome for variable $y$ year t (for example, GDP growth in 2008) and assume that the forecast for $y$ is $\hat{y}(h)_{it}$, where $h$ shows how many months prior to the outcome the forecast is published. $h$ is thus a measure of the information available at the time of publication – the lower $h$ is, the shorter the forecast horizon is and the more information is available. i is an index of different forecasters.

Forecaster i's different absolute forecast error can thus be defined as

$$\varepsilon_{it} = \left| y_t - \hat{y}(h)_i \right| \quad (1)$$

The mean absolute error (MAE) for forecaster i is calculated as

$$MAE_i = \frac{\sum \varepsilon_i}{n_i} \quad (2)$$

where $n_i$ = number of forecasts made by the respective forecaster.

MAE defined as in equation (2) is often used to compare different forecasters.

The starting point for the new calculation method is that the absolute forecast errors in equation (1) can be divided up into different components: a component that is due to the amount of information available at the time of publication (the forecast horizon), a component that reflects the different forecasters' general forecasting ability ($\mu_i$) and a component that captures the fact that different years can be more or less difficult to forecast for all forecasters ($\lambda_t$).

The absolute forecast error can thus be divided up as follows:

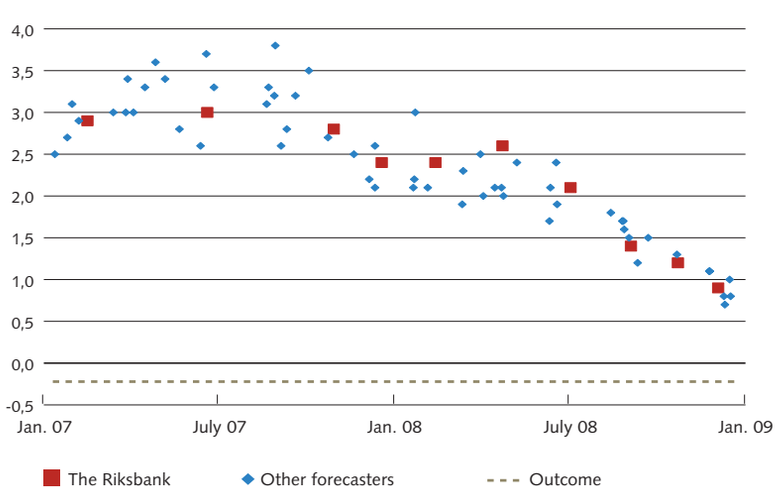
$$\varepsilon_{it} = \alpha h_i + \mu_i + \lambda_t + e_i \quad (3),$$

where $\alpha$ shows the effect on the forecast error of the horizon increasing by one month and $e_{it}$ is a random error term.

By estimating equation (3) using a statistical method and comparing the estimate of $\mu_i$ for the various forecasters it is possible to make a comparison where one has taken into account the fact that forecasters publish their forecasts at different points in time and thus have access to different amounts of information.

**Figure 1. GDP growth 2008, outcome and forecasts at different points in time.**

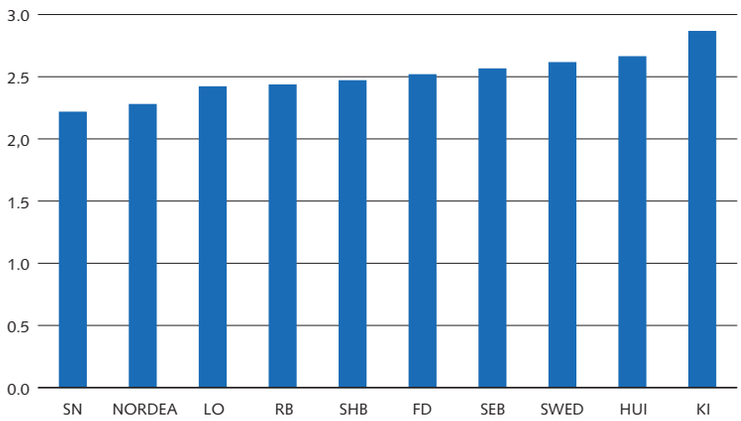
Annual percentage change




Note. Other forecasters refer to the institutes listed in footnote 2.
Sources: National Institute of Economic Research, Statistics Sweden and the Riksbank

**Figure 2. The accuracy of the forecasts for GDP growth 2008 among different forecasters.**

Adjusted mean absolute error in percentage points

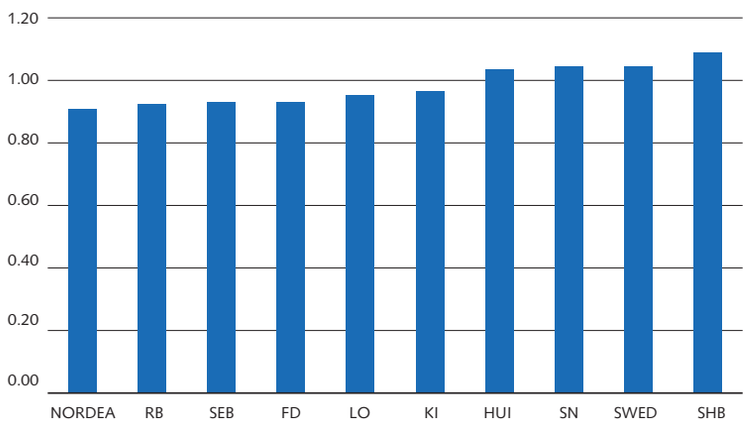



Note. See footnote 2 for an explanation of the abbreviations.

Sources: The National Institute of Economic Research and the Riksbank.

**Figure 3. The accuracy of the forecasts for GDP growth among different forecasters, 1999-2008.**

Adjusted mean absolute error in percentage points




Note. See footnote 2 for an explanation of the abbreviations.

Sources: The National Institute of Economic Research and the Riksbank.