## Box 1 Forecasting errors in Central Bank inflation forecasts

*Monetary Bulletin* 2002/1 included an evaluation of errors in inflation forecasts by the Central Bank and other forecasters of inflation in Iceland. A similar evaluation is provided below. It is vital for the Central Bank to monitor the errors in its inflation forecast, which together with other types of economic analysis has become an integral part of the Bank's activities after the change in the monetary framework almost two years ago. An updated evaluation of the Central Bank's annual and quarterly forecasts is discussed below, but comparison to forecasts from other sources will not be discussed on this occasion.

Evaluations of inflation forecasts focus on their bias and root mean square error (RMSE). The bias shows the forecasts' mean deviation from actual inflation and thus whether inflation is being systematically over- or underpredicted. The root mean square error measures how far the forecast value differs from the true value.

Table 1 presents an overview of the Central Bank's forecasting errors over the period from the fourth quarter of 1994 to the fourth quarter of 2002. It should be borne in mind that some forecasts for the first years do not extend over full four quarters, but those made from

Evaluation of forecasting errors in Central Bank

11	iflation	torecast	S	
Forecast for next	one	two	three	four
(number of quarters):	quarter	quarters	quarters	quarters
Bias	0.01	-0.07	-0.12	-0.33
RMSE <sup>1</sup>	0.41	0.90	1.43	1.78
Forecast for infla-		Forecast published in		
tion within year:	Q1	Q2	Q3	Q4
Bias	-0.86	-0.56	-0.21	-0.14
RMSE <sup>1</sup>	2.38	1.82	1.11	0.76
Forecast for year-on-		Forecast published in		
year annual inflation	Q1	Q2	Q3	Q4
Bias	-0.27	-0.18	0.01	0.00
RMSE <sup>1</sup>	1.15	0.68	0.35	0.10

1. RMSE: Root mean square error.

Q4/1999 onwards cover at least four quarters. Since Q2/2001 the Bank has forecast at least eight quarters in advance, as assumed in the joint declaration of the Government of Iceland and the Central Bank from March 2001. In April this year, when figures for Q1/2003 become available, it will for the first time be possible to compare a forecast eight quarters ahead with actual inflation.

The upper part of the table shows the bias and RMSE of forecasts projecting from one to four quarters into the future. One-quarter forecasts reveal virtually no bias, but this grows as the forecast horizon is extended and on average the Bank has underpredicted inflation by 0.33% on a four-quarter projection. However, this may be misleading. Until 2000 the error of forecasts over a horizon of four quarters was only -0.01% while over the period 2000-2002 it was -0.81%. The largest deviation emerged during the first half of 2001 when the impact of the unanticipated weakening of the króna in the second half of 2000 and first part of 2001 was being transmitted into the price level. The Bank forecasts are always based on the assumption of unchanged exchange rate, since research indicates that to be normally the best forecast. As may be expected, the RMSE increases the longer the forecasting period, as uncertainty increases.

For obvious reasons, in the cases of forecasts over one calendar year, the largest bias and highest RMSE are observed for the forecast conducted at the beginning of each year, when the forecasting period is longest, then these diminish as the forecasting period wears on.

Due to the carry-over effect involved in year-onyear average inflation forecasts, i.e. from the previous to the current year, the bias and RMSE is lower.

It would also be interesting to examine the discrepancy between actual inflation and confidence limits in the Bank's forecasts. Since the Bank has only recently begun to publish forecasts which incorporate these factors, the number of available forecasts four quarters ahead that can be compared to such confidence limits is still insufficient, but soon this will be possible.

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