Box 1 Forecasting errors in Central Bank and other inflation forecasts

Monetary Bulletin 2001/1 included a survey of errors in inflation forecasts by the Central Bank and other forecasters of inflation in Iceland. These errors have now been reassessed. It is vital for the Central Bank to monitor the errors in its inflation forecast, which is now one of the most important aspects of its activities after last year's change in the monetary policy framework. Together with other economic analyses, inflation forecasts play a key role in the Bank's monetary decisions. The following is an assessment and comparison between the Central Bank's annual and quarterly forecasts and corresponding forecasts from other sources.

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 a survey of annual inflation forecasts by the Central Bank of Iceland and other analysts, together with actual inflation figures for the period 1994-2001. As a rule the forecasts cited were those published closest to the beginning of the respective year, and in most cases after the CPI for January was made known. They are based on changes in annual averages of the CPI. Up to and including 1998 there was a tendency to overpredict inflation, which was reversed in the second half of the period when all analysts underpredicted inflation for 1999 and 2001. Forecasts for 2000 turned out to be in line with the actual rate of inflation during the period. Until last year the Central Bank's forecasts had both the lowest RMSE and smallest bias until it produced a large deviation which gave the National Economic Institute the lowest RMSE, while the bias is roughly the same for all forecasters. Over the entire period the RMSE is 1.1% in Central Bank annual forecasts, 0.9% at the NEI and the 1.4% at the Economic Consulting and Forecasting Ltd. (ECF). The Central Bank's mean bias is -0.2% compared with 0.1% at the NEI and -0.1% at the ECF. Íslandsbanki hf produced only three annual forecasts, hardly enough to draw any conclusions, and other forecasters produced even fewer.

Table 2 compares quarterly forecasts by the Central Bank and ECF. Íslandsbanki hf was included in the survey a year ago but has not published quarterly forecasts for some time, so it is omitted now. As far as is

Table 1 Forecasts for annual CPI inflation 1994-2001[1]

%	1994	1995	1996	1997	1998	1999	2000	2001
Central Bank of Iceland	1.4	2.5	2.4	2.1	2.6	1.9	5.0	4.3
National Economic Institute	2.5	2.5	2.5	2.5	2.7	2.5	3.9	5.8
ECF	1.3	3.0	2.9	2.3	3.2	2.3	5.0	3.7
Íslandsbanki[2]	.	.	.	.	.	1.7	4.9	4.4
Landsbanki Íslands	.	.	.	.	.	.	.	3.5
Kaupthing	.	.	.	.	.	.	.	3.6
Realised inflation	1.5	1.7	2.3	1.8	1.7	3.4	5.0	6.7

1. Change in consumer price index between annual averages. Forecasters' closest forecast to the New Year is shown in each case.
2. Prior to the merger of Íslandsbanki and FBA, the FBA forecast is used for 2000 and the Íslandsbanki forecast for 1999.

known, no other sources have produced quarterly forecasts. The scope of this comparison is from 1995-2001, involving periods of different lengths; ECF forecasts do not go back any further. ECF does not publish quarterly forecasts, only the monthly values of the index three months in advance, which are recalculated here as quarterly forecasts. In the first half of the period ECF overpredicted inflation on average, by 0.26% from 1995-2000, but underpredicted it by 0.05% on average in 1999-2001. Last year saw ECF's first underprediction for the following quarter since 1995: by 0.4% on average, distributed fairly evenly over the year. For most of the period the Central Bank's bias was much lower, or 0.06% from 1995-2000 but -0.11% in 1999-2001. The Central Bank also underpredicted inflation for the following quarter last year, by an average of 0.3% or rather less than ECF. The main factor at work there was a 1% underprediction during Q2, when the CPI rose by 3.5% between quarters. The mean bias for the other three quarters was acceptable, falling only 0.1% short. ECF's RMSE is rather higher than the Central Bank's for the period as a whole, although the difference is only slight. During the second half of the period, from 1999-2001, ECF's RMSE was 0.41%, which is lower than the Central Bank's 0.53% then.

Table 2 Comparison of quarterly forecasts

%	Root mean square error (%)	Mean bias (%)
Central Bank		
1995:1-2001:4	0.44	0.00
1995:1-2000:4	0.42	0.06
1999:1-2001:4	0.53	-0.11
ECF		
1995:1-2001:4	0.45	0.16
1995:1-2000:4	0.45	0.26
1999:1-2001:4	0.41	-0.05

Finally, the Central Bank's forecasts four quarters in advance were examined. Data are available for the period 1998:1-2001:4, apart from the first two quarters of 1999 and 2000, for which forecasts four quarters in advance were not published. Thus there are twelve measurements over the period with a mean bias of -0.6% and an RMSE of 1.9%. The forecast four quarters in advance from January 2001 makes a great difference here, since it ended up outside the 90% confidence limits. Excluding this single forecast, the mean bias is -0.3% and RMSE 1.6%. If the current forecast holds good or underpredicts inflation, the forecast four quarters in advance to the first quarter of this year will also end up outside the 90% confidence limits. The main reason for the greater forecasting error last year was that an unchanged rate of exchange is always assumed for the forecast period. Over last year the króna weakened by almost 15%. Studies of the effect that exchange rate has on prices show that, assuming unchanged wages, prices rise by 0.4% in the long run when the exchange rate depreciates permanently by 1%. If the above depreciation proves permanent, all things being equal it should cause the price level to rise by almost 6% in the long run.