

## Appendix 1

# Inflation target misses: A comparison of countries on inflation targets

Just over four years have elapsed since the Central Bank of Iceland moved onto an inflation target as its new monetary policy regime. Iceland is one of just over 20 countries to do so since New Zealand became the first inflation targeter in 1990.<sup>1</sup>

Under the new framework, price stability was made the main objective of monetary policy in Iceland. The target was specified in a joint declaration by the Central Bank and the Government of Iceland as a twelve-month rise in the consumer price index (CPI) of 2.5%.

Although the Central Bank aims to keep the rate of inflation on average as close to 2.5% as possible, temporary deviations from the target are sometimes unavoidable, e.g. when inflation increases or decreases due to unforeseen shocks beyond the Central Bank's control. Circumstances may also arise in which the Bank sees no reason to prevent deviations if they are short-lived and do not undermine the credibility of the target. In this context it should be borne in mind that the main purpose of the inflation target is to create a credible medium-term anchor for inflation expectations. Provided that the Bank's explanations for deviations are credible, they need not damage the credibility of its monetary policy.

### Target misses

Even though temporary target misses are unavoidable and need not be harmful, very frequent and large misses can clearly undermine the credibility of monetary policy. In this light it is worth examining how successful central banks on an inflation target have been in keeping inflation close to the target.

The first column of the table shows the average deviation from the target (or midpoint of a target range) in the 21 countries defined as inflation targeters by Pétursson (2004).<sup>2</sup> It reveals that a number of central banks have managed to keep average inflation on target (Chile, Israel, Poland and the UK). However, average inflation has been some

1. A detailed description of these countries' inflation targeting regimes and their evolution is given by Pétursson (2004). An assessment of the macroeconomic impact of inflation targeting is provided by the same author (2005).

2. Data show quarterly year-on-year changes in the CPI, except for countries that target core inflation. These countries are Australia and New Zealand (CPI excluding mortgage interest costs until 1999 in Australia and 2000 in New Zealand, when the index was redefined and mortgage interest costs excluded from it); the UK (retail price index excluding mortgage interest costs until 2004, then the HICP); Norway (CPI adjusted for tax changes and excluding energy products); South Africa (retail price index excluding mortgage interest costs); South Korea (CPI excluding agricultural products and oil); Thailand (CPI excluding energy and unprocessed food items); and the Czech Republic (CPI excluding regulated prices and the direct impact of indirect taxes and subsidies until April 2001, then headline CPI). Data extend to Q2/2005. For further discussion of the data and development of inflation targets in the country sample, see Pétursson (2004, 2005).

way above target over this period in Iceland, which ranks with Brazil, Mexico and South Africa among the highest overshooters. The second column shows the standard deviation of target misses (or from the midpoint of the target range). The standard deviation is around 2.3% in Iceland, while the average is 1.6% in the total sample and only 1% for the eight sampled industrialised countries.

### Inflation target misses

Country	Average deviation from target (%)	Standard deviation of target misses (%)	Frequency of target range misses (%)	Average value of target range misses (%)	Duration of target range misses (quarters)
Australia	0.2	1.1	51.0	0.8	4.2
Brazil	3.3	4.1	64.0	3.3	5.3
Canada	-0.4	1.0	37.0	0.6	2.0
Chile	0.0	1.5	43.0	1.2	4.3
Columbia	-0.3	1.9	40.0	1.0	4.0
Czech Republic	-1.9	2.0	81.0	1.8	5.5
Hungary	1.0	1.5	33.0	2.0	5.0
Iceland	1.7	2.3	33.0	1.7	3.0
Israel	0.0	2.8	82.0	1.8	6.4
Mexico	2.3	1.6	73.0	0.5	4.0
New Zealand	0.2	0.8	19.0	0.3	3.0
Norway	-1.1	1.2	61.0	1.0	11.0
Peru	-0.5	1.4	43.0	1.0	3.0
Philippines	-0.4	2.4	86.0	1.9	6.0
Poland	0.0	2.6	74.0	1.6	5.0
South Africa	1.6	2.3	50.0	2.1	7.0
South Korea	-0.6	1.7	46.0	1.3	3.3
Sweden	-0.9	1.1	48.0	0.8	6.7
Switzerland	-0.1	0.5	5.0	0.0	1.0
Thailand	-1.1	0.5	0.0	-	-
UK	0.0	0.4	0.0	-	-
Average of sample	0.2	1.6	46.0	1.3	4.7
Average of industrialised countries	0.0	1.1	32.0	0.7	3.9
Average of other countries	0.3	2.0	55.0	1.5	4.5

On first impression the Central Bank of Iceland appears to rank with the poorest performers in inflation targeting: only five countries have a higher standard deviation and none of them is an industrial country. However, several qualifications need to be made, all partly explaining Iceland's poor rating in this comparison. First, Iceland bases its inflation target on the headline CPI. Several other central banks base their targets on a core index which is less volatile than the headline index. Second, a number of central banks in the sample have regularly changed their targets over the period, sometimes even in line with the inflation outlook, with the aim of reducing target misses. Examples are the changes in central bank targets in Brazil and Columbia in recent years. Third, it should be pointed out that some central banks did not set numerical targets until several years after formally moving onto an inflation target, to allow the surge in inflation caused by imbalances under the preceding monetary framework to subside. Examples are South Korea and Sweden when they abandoned their fixed exchange-rate regimes. This obviously produces smaller deviations from target in these countries compared to Iceland, which defined a numerical target from the outset and has not changed it since. In fact, deviations from

the inflation target in Iceland can largely be attributed to pressures which accumulated during the fixed exchange-rate era and came to the fore in the first year after the target was introduced. The króna depreciated swiftly after it was floated, which sent inflation soaring. This is evident from Chart 1, where the standard deviation of target misses (using a two-year window) has been falling in recent times and is currently around 1%, in line with the figures for other industrial countries.<sup>3</sup>

Despite these shortcomings in the comparison, it cannot be denied that Iceland has shown fairly large deviations from the inflation target. A number of explanations are possible. First, the Central Bank of Iceland might simply be underperforming in its targeting relative to other central banks, and be less credible than most other central banks. Another explanation is that Iceland simply experiences a more volatile business cycle with sharper impacts on inflation developments than most other countries (especially the industrialised ones), making it more difficult to keep inflation on target.

One approach for exploring this more closely is to examine the correlation between the standard deviation of target misses and the standard deviation of output growth in the respective countries (output growth data are from Pétursson, 2005). In the total sample, the correlation is only 0.2, which is hardly large enough to support this hypothesis conclusively. However, countries such as Brazil, South Africa and Hungary have had difficulty in keeping inflation close to target in spite of relatively mild business cycles in the sample period, while others such as South Korea and New Zealand experience strong swings but have still kept exceptionally close to target. Removing these five countries from the sample substantially increases the correlation between standard deviations in the inflation target and output growth, to just over 0.6. Thus Iceland's target misses appear to be attributable to economic volatility to some degree. While the objective of monetary policy is admittedly to dampen business cycle volatility, some fluctuations can be expected to persist in Iceland on account of its small and relatively undiversified economy, the strong impact that exchange rate fluctuations have on domestic prices, and the importance of industries based on natural resources which are prone to fluctuations beyond the scope of monetary policy.

### Inflation beyond the target range

Most inflation-targeting central banks also set a target range around their point targets, but assign different functions to them. Some countries only define a target range within which inflation will be kept. In other countries, including Iceland, the range defines only the size of deviation that may be regarded as normal based on underlying fluctuations in inflation; in such cases, the central bank is expected to provide an explanation when inflation moves outside the range. However, these countries have generally underlined that the range serves

Chart 1  
Deviation of target misses (two-year window)  
Q4/2002 - Q2/2005



Source: Central Bank of Iceland.

3. When Iceland moved onto an inflation target in 2001, the Central Bank announced its objective of bringing inflation down to target no later than the end of 2003, which was achieved. Confining the study to the period since 2003 yields an average deviation from target of only 0.4% and a standard deviation of 0.9%.

no real role in monetary policy decisions, emphasising the point target as the focal point of policy decisions and that inflation outcomes outside the range can sometimes be natural.

Column three of the table shows the frequency of target range misses in the 21 sampled countries. It shows that inflation has always stayed within the range in Thailand and the UK but has been outside the range in more than 80% of cases in the Czech Republic, Israel and the Philippines. In Iceland, inflation has been outside the range in one out of three instances. This is in line with the experience of other industrialised countries, although it should be borne in mind that the target range in Iceland is wider than in other industrial countries (3% as against 2%; see Pétursson, 2004). Based on the standard deviation of target misses and assuming a normal distribution, inflation in Iceland could have been expected to be outside the range in 45% of cases.<sup>4</sup> Thus the frequency of range misses has been somewhat lower than might have been expected for a normal distribution.

As the fourth column shows, the absolute deviation of range misses has been greatest on average in Brazil and South Africa. Iceland's average has been around 1.7%, which is somewhat higher than in other industrialised countries despite its rather wider range, and is the result of the high rate of inflation during the first year of targeting, as pointed out above.<sup>5</sup>

Finally, the table shows the average number of quarters when inflation has been outside the target range. Norway has experienced the longest duration of range misses, with inflation below the range for just under the last three years. Inflation has been outside the range for three quarters on average in Iceland, which is less than the industrial countries' average. In general, however, these deviations appear to be relatively short-lived, given the lags in the transmission mechanism of monetary policy, which is commonly considered to be around two years. This implies that central banks respond to foreseeable target range breaches well before they actually occur.

### Conclusion

The finding of this comparison is that Iceland has experienced greater deviations from its inflation target than other industrialised countries, partly reflecting its highly volatile business cycle. However, the bulk of these deviations may be traced to the inflationary phase following the exit from the fixed exchange-rate regime in 2001, so that the standard deviation of target misses is probably greater so far than may be expected in the future. The frequency of target range misses is well in line with that of other industrialised countries and is what might be expected given the underlying fluctuations in inflation in the sample period. The target range misses have, moreover, been relatively short-lived.

4. The range was narrowed from 5% in 2001 to 3.5% in 2002 and to the current 3% in 2003. Based on a 2.3% standard deviation of target misses, the range should contain 55% of the probability distribution of inflation on average over the whole period, i.e. inflation should lie outside the range in 45% of cases based on a normal distribution of target misses.

5. For the period since 2003 the numerical value of deviations from the target range is 0.4%.

The general conclusion is that deviations from the inflation target appear to be fairly common and sometimes fairly large and persistent. Nonetheless, this has not permanently damaged the credibility of the regime, and no central bank has abandoned inflation targeting due to dissatisfaction with its results.<sup>6</sup>

#### *Sources*

Pétursson, Thórarinn G. (2004): Formulation of inflation targeting around the world, *Monetary Bulletin* 2004/1, 57-84.

Pétursson, Thórarinn G. (2005): Inflation targeting and its effects on macroeconomic performance, *SUERF Studies*. Forthcoming.

6. Finland and Spain discontinued inflation targeting in 1999 when they joined the EMU. Poland, the Czech Republic and Hungary will do the same several years hence.