

Box 4 The short-term relation between changes in policy interest rate and exchange rate

One of the most important transmission channels for monetary policy in a small, open economy like Iceland is the exchange rate channel. By raising its policy rate the Central Bank of Iceland can make domestic bonds more attractive, thus increasing demand for them, which in turn increases demand for krónur, leading to a temporary strengthening of the exchange rate, all other things being equal. Such a strengthening causes a temporary rise in the real exchange rate which then weakens the competitive position of domestic industries and reduces domestic demand. Furthermore, the stronger exchange rate slows down rises in import price increases, which has a direct effect on domestic prices. The output gap and inflationary pressure are thereby diminished.

Monetary policy, on the other hand, is only one of many determinants of exchange rate developments, since other market factors and investor expectations are also important and often more so. For this reason it has often proved difficult to assess the impact of monetary policy on the exchange rate and its timing. One

method which is frequently employed is to use a VAR analysis which attempts to isolate the impact of policy rate changes on the exchange rate of currencies. The general findings of such studies suggest that the impact of central bank interest changes are generally in the direction indicated by theory, but often take longer to be transmitted than might have been expected beforehand. A similar analysis is made in Thórarinn G. Pétursson's article in *Monetary Bulletin* 2001/4.¹ It emerges there that the changes in the Central Bank's policy rate have relatively little impact on the exchange rate of the króna for the following quarters and that their delayed timing is consistent with comparable international studies.

Despite the relatively small impact of monetary policy on the exchange rate in the long run, the short-term impact can be sizeable. One way to examine this is to take the days when the Central Bank has changed

1. Thórarinn G. Pétursson (2001), "The transmission mechanism of monetary policy", *Monetary Bulletin*, 2001/4, pp. 62-77.

its policy interest rate and analyse the impact this had on the exchange rate of the króna in the following days using a simple regression analysis. The regression model is given as

$$(100/k)(\log s_{t+k} - \log s_t) = \alpha_k + \beta_k x_t + \varepsilon_{kt}$$

where s_t is the exchange rate index for the Icelandic króna against foreign currencies on day t , x_t is the change in the Central Bank's policy rate on day t , k is the number of trading days after the change in the policy rate, ε_{kt} is an independent and identically distributed residual and α_k and β_k are the parameters to be estimated.

To examine the impact of changes in the policy interest rate on the exchange rate of the króna, data were used from November 18, 1997, when the Central Bank made its first interest rate change after the reorganisation of Iceland's foreign exchange market on July 8 the same year. Since then, the Central Bank has changed its policy rate eighteen times. Thus, the analysis involves a relatively small data set, during which substantial systemic reforms were made, e.g. concerning the Central Bank's involvement in the foreign exchange market and the monetary policy framework. These findings therefore need to be interpreted cautiously.

The Central Bank's policy rate changes are always made after the closure of the market, so that the changes are measured then. The foreign exchange rate index is the registered exchange rate for each day, so that s_t is the registered exchange rate for the day when the interest rate change is made (just before noon that day). Exchange rate changes are therefore calculated between two daily recorded exchange rates.²

The empirical analysis assesses the impact of policy interest rate changes on the exchange rate of the króna one, two, five, seven, ten and thirty trading days following the policy rate change. The estimation results are shown in the table.

It can be seen that a rise in the policy rate generally has a statistically significant negative impact on the foreign exchange rate index for up to seven business days afterwards (based on the 95% confidence level), i.e. a rise in the policy rate leads to a rise in the

The effects of Central Bank of Iceland policy rate changes on the króna 1997-2002

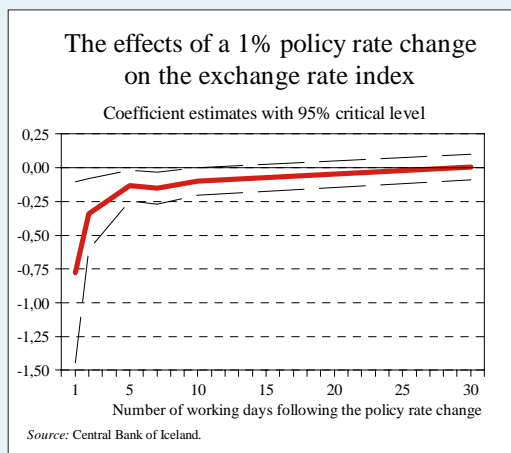
Working days following the policy rate change	β_k	$se(\beta_k)$	R^2_k
$k = 1$	-0.775†	0.321	0.216
$k = 2$	-0.342†	0.126	0.284
$k = 5$	-0.133†	0.055	0.110
$k = 7$	-0.152†	0.057	0.144
$k = 10$	-0.101	0.048	0.123
$k = 30$	0.004	0.045	0.000

$se(z)$ is the standard error of coefficient z corrected according to the Newey-West method. † indicates that the coefficient is statistically significant from zero according to a 95% critical level.

exchange rate of the króna, and the opposite applies if interest rates are cut. The initial impact is the largest, with a 1% policy rate rise leading to a 0.75% fall in the exchange rate index on average. The impact is just over 0.3% after two days, 0.15% after seven business days and has become statistically insignificant from zero ten days after the interest rate change.

Likewise, the explanatory power of monetary policy for exchange rate movements is the greatest immediately after the rate change. Interest rate changes explain about 20% or more of exchange rate changes for the first two days afterwards, but their impact has totally disappeared 30 business days afterwards.

The chart shows the accumulated impact of interest rate changes on the exchange rate index. It shows how the effects are greatest at first and then slowly fade out.



2. It would have been better to measure s_t with the exchange rate of the króna at the end of each day, but such data are not available for the whole period.