Trade-offs in monetary policy

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Flexible inflation targeting implies that the central bank must in the short term strike a balance between price stability and stability in the real economy. With some types of disturbance, for example a demand shock, there will be little or no conflict between these two objectives. Other disturbances, for example a cost-push shock, may create a conflict between price stability and stability in the real economy in the short term. The central bank then faces a trade-off. The horizon for achieving the inflation target implicitly provides some indication of how much weight the central bank gives to stability in the real economy. Considerable emphasis on stability in the real economy implies a relatively long horizon. In Norges Bank's view, a two-year horizon for achieving the inflation target normally provides a reasonable trade-off between the objectives of price stability and stability in the real economy.

The operational target for monetary policy is 2½ per cent inflation over time. Inflation may at times be higher or lower than this. Various interest rate setting strategies may be used to bring inflation back to target. One of the key questions in monetary policy is how quickly to proceed.

Monetary policy cannot influence consumer price inflation to any great extent over the months immediately ahead, partly because it takes time to change wage growth. Furthermore, many prices are subject to agreements that apply for a certain period ahead. If the objective of monetary policy were to bring inflation rapidly back to target, for example in the course of six months, the interest rate would probably have to be set to induce a substantial change in the exchange rate. Such a monetary policy strategy would at the same time result in sharp changes in demand and output. This can be described as strict inflation targeting. A more flexible approach may be to apply a somewhat longer period to bring inflation back to target, so-called flexible inflation targeting. This strategy would have less impact on demand and output than strict inflation targeting.

In many cases, a change in interest rates will contribute to steering both inflation and total demand in the desired direction. A fall in aggregate demand, for example, could result in a level of inflation, output and employment that is too low. An appropriate monetary policy stance would then be to maintain a low interest rate to stimulate a rise in both demand and inflation. Other disturbances may, however, create a conflict between stabilising inflation and the real economy in the short term. One example is a cost-push shock that pushes up inflation but at the same time reduces output and employment. A tighter monetary policy would then contribute to reducing inflation, but might at the same time result in a further fall in output and employment. Different types of disturbance will often occur at the same time, and the central bank must strike a balance between variability in output and employment on the one hand and inflation variability around the inflation target on the other.

The trade-off between price stability and stability in the real economy is often described in the theoretical literature as minimising a loss function, which includes variability in both output and inflation. See, for example, Svensson (2002).[1]

The central bank should choose the interest rate path that minimises the loss function:

$$L_t = E_t \sum \delta^\kappa [\, (\pi_{t+k} - \pi^*)^2 + \lambda(y - y^*)^2_{t+t}\,] \qquad (1)$$

In the equation, π_t denotes inflation, π^* the inflation target, y_t is output and y^* is potential output.[2] E_t is an expectations operator and indicates that expectations are formed in period t. This loss function includes expected deviations in output from potential output and deviations in inflation from the inflation target in all future periods. The deviations are represented quadratically. Substantial deviations from the targets are thus assessed as considerably more costly than slight variations. If inflation deviates substantially from the inflation target, or considerable imbalances arise in the real economy, a relatively aggressive use of instruments may be appropriate. The trade-off between inflation stability around the inflation target and stable growth in output is expressed by the parameter λ.

The discount factor δ refers to the emphasis placed on future deviations from the target.

This is a theoretical description of inflation targeting. Few central banks, if any, use such a loss function in practice. In the literature, the monetary policy regime is referred to as flexible inflation targeting if λ is greater than zero, i.e. that consideration is given to variability in both output and inflation. Strict inflation targeting implies that λ equals or is close to zero.

This theoretical description captures the main ration-

[1] Svensson, Lars E. O. (2002): "Monetary Policy and Real Stabilization", mimeo, Princeton University.

[2] y* may alternatively be interpreted as what output would have been if all prices had been entirely flexible.

ale behind the practical policy implementation by inflation-targeting central banks.

The choice of monetary policy horizon implicitly provides some indication of the central bank's loss function. A central bank that places considerable emphasis on inflation and little on the real economy will choose a short horizon. A central bank that places considerable emphasis on the real economy will choose a long horizon.[3]

Norges Bank has stated that interest rates will normally be set with a view to achieving an inflation rate of 2½ per cent two years ahead. However, it would in general be possible to achieve the inflation target more quickly with a more aggressive use of instruments. According to the theoretical literature, Norway thus has a flexible inflation target, where variability in both output and inflation is given weight.[4] Behind the choice of a two-year horizon lies a perception of how the interest rate affects developments in inflation and output, and the central bank's trade-off between variability in these two variables. This simple rule is more specific, more operational and easier to evaluate than the theoretical loss function. It is also a simplification. In most situations, a horizon of about two years will provide a reasonable trade-off between the objectives of price stability and stability in output and employment.

The inflation projection two years ahead is, however, an intermediate objective. The primary objective is nominal stability over time. Consequently, the path of inflation and the real economy in the period ahead will be taken into account when setting interest rates. In situations where the central bank's forecasts indicate that substantial imbalances in the real economy would arise if the interest rate was set so that the inflation forecast two years ahead was precisely on target, it might be appropriate to apply a somewhat longer time horizon. Financial market confidence in the inflation target also provides Norges Bank with greater scope for promoting stability in the real economy. This scope will increase further as the inflation target is incorporated as an anchor for wage formation.

However, if there is a risk that inflation may deviate considerably from the target over a lengthy period, or confidence in monetary policy is in jeopardy, a rapid and pronounced change in the interest rate may be appropriate.

[3] See, for example, Frank Smets (2000), "What horizon for price stability?", ECB *Working Paper* No. 24.

[4] How the interest rate affects the path of inflation and output is discussed in more detail in a box in *Inflation Report* 4/2000: "Effects of a change in interest rates".