

Monetary Economics

The Practice of Central Banking - Instrument and Targeting Rules

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Introduction

- ▶ Three Fundamental Problems of Monetary Policy Under Discretion
 - ▶ Inflation Bias - unexpected change in policy can "confuse" the private sector
 - ▶ uncertainty about the structure of the economy (and not only shocks)
 - ▶ lags in economy response to interest rate - lack of knowledge about the transmission mechanism
- ▶ Friedman 1960 - No monetary policy is possible and desirable. Fix Money Growth Rule
- ▶ Taylor Rule as Constrained Discretion
- ▶ Inflation Targeting as discretion with fix objective

Monetary Policy Rules

- ▶ Friedman - Fix Money Growth Rule: any other policy inefficient
- ▶ Today - Rules to make policy predictable (and efficient)
 - ▶ Instrument Rules - Taylor Rule

$$i_t = i_{t-1} + \phi_\pi (\pi_t - \pi^*) + \phi_y y_t$$

- ▶ Targeting Rule - Define the final target - Lower policy constraint, more transparency in the objectives

$$\pi_t = \pi^*$$

Inflation Forecast Targeting

- ▶ Inflation Targeting is about a set of rules on how do conduct and communicate monetary policy
 - ▶ Independent monetary policy authority (instrument, not goal independence) - long term focus
 - ▶ communicate a technical objective in line with social preferences - define a numerical inflation target and be accountable for its achievement
 - ▶ clearly define the rules to follow to reach that objective - transparency in the decision process and responsibilities
- ▶ Inflation Forecast Targeting is the way inflation targeting is implemented in a situation where the response of the economy to change in monetary policy is slow
- ▶ Is inflation targeting "best" Monetary Policy strategy? no comment

Inflation Forecast Targeting

The principles for monetary policy decisions can be formulated as a simple rule of thumb: if the inflation forecast, based on an unchanged repo rate, is in line with the target at the suitable horizon, than the monetary stance is appropriate: if the forecast is above (below) the inflation target, than the monetary stance is too expansionary (restrictive) and the repo reate should be raised (lowered) immediately or in the near future. As this rule of thumb refers to an inflation forecast with the instrument unchanged, it is natural for the Riksbank to present its forecast accordingly (Berg, 2000)

Inflation Forecast Targeting

- ▷ Dynamic IS-AS model (Svensson 1999)

$$\pi_{t+1} = \pi_t + a(y_t) + \varepsilon_{t+1} \quad (1)$$

$$y_{t+1} = b(y_t) - c \left(i_t - \pi_{t+1|t}^e \right) + \eta_{t+1} \quad (2)$$

- ▷ Monetary policy affects inflation with a two-period time lag.

Inflation Forecast Targeting

Conditional Inflation Forecast

$$E_t \pi_{t+2} = E_t (\pi_{t+1} + a(y_{t+1}) + \varepsilon_{t+2}) \quad (3)$$

Conditional on constant interest rate. Substituting (1) and (2) in (3) we have:

$$E_t \pi_{t+2} = E_t \left[\begin{array}{c} \pi_t + a(y_t) + \varepsilon_{t+1} + \\ + a [b(y_t) - c(i_t - \pi_{t+1|t}) + \eta_{t+1}] + \varepsilon_{t+2} \end{array} \right] \quad (4)$$

Inflation Forecast Targeting

Expected inflation at time $t + 1$ is predetermined equal to:

$$E_t \pi_{t+1} = \pi_t + a(y_t)$$

Re-write (4), as

$$E_t \pi_{t+2} = E_t \left[\begin{array}{c} \pi_t + a(1+b)y_t - \\ -ac(i_t - \pi_t - ay_t) + a\eta_{t+1} + \varepsilon_{t+1} + \varepsilon_{t+2} \end{array} \right]$$

or

$$E_t \pi_{t+2} = E_t \left[\begin{array}{c} (1+ac)\pi_t + \\ +a(1+b+ac)y_t - aci_t + a\eta_{t+1} + \varepsilon_{t+1} + \varepsilon_{t+2} \end{array} \right] \quad (5)$$

Inflation Forecast Targeting

Central Bank Objective - Strict Inflation Targeting

$$\min_{\{i_\tau\}_{\tau=t}^{\infty}} E_t \sum_{\tau=t}^{\infty} \delta^\tau L(\pi_\tau, y_\tau) \quad (6)$$

No Commitment - Period by Period Problem subject to (5)

$$\min_{i_t} E(L) = \delta^2 E_t \left[\frac{1}{2} (\pi_{t+2} - \pi^*)^2 \right]$$

Inflation Forecast Targeting

The solution to this linear quadratic problem produces the following Interest Rate Rule:

$$i_t = \pi_t + ay_t + \frac{1}{ac} (\pi_t - \pi^*) + \frac{(1+b)}{c} y_t \quad (7)$$

or

$$i_t = \pi_{t+1|t} + \frac{1}{ac} (\pi_t - \pi^*) + \frac{(1+b)}{c} y_t \quad (8)$$

Taylor Rule - Interest Rate Should respond to deviation of inflation to the target and deviation of output from long term trend

Given this rule the unconditional forecast of inflation is:

$$\pi_{t+2|t}^e = \pi^* \quad (9)$$

Inflation is on the target - but only as forecast!!

Optimal Monetary Policy

- ▶ The variable to affect inflation is the real interest rate - need to move the nominal rate more than expected inflation
- ▶ Elasticity of Interest rate to Inflation forecast >1 (Taylor Principle)
- ▶ Response to whatever information necessary in forecasting inflation
- ▶ Note - Even Strict Inflation Target respond to Output fluctuations