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Lecture 10: Discretionary policy and time-inconsistency of monetary policy

1.1 The model

(1.1) $$y_t = \gamma(\pi_t - \pi_t^e) + u_t,$$

(1.2) $$\pi_t^e = E_{t-1}\pi_t,$$

The policymaker has preferences over inflation and output, which are represented by the following loss function:

(1.3) $$L_t = \frac{1}{2}[(\pi_t - \pi^*)^2 + \lambda(y_t - y^*)^2],$$

where $\lambda > 0$ and $y^* > 0$.

The monetary policymaker is assumed to control the rate of inflation π_t.

Discretionary policy

The discretionary solution can be found by minimizing L_t with respect to π_t and subject to (1.1) and (1.2). This results in the following first order condition:

(1.4) $$(\pi_t - \pi^*) + \gamma\lambda(y_t - y^*) = 0$$

This gives the following solutions for inflation and output:

(1.5) $$\pi_t = \pi^* + \lambda\gamma y^* - \frac{\lambda\gamma}{1+\lambda\gamma^2} u_t,$$

(1.6) $$y_t = \frac{1}{1+\lambda\gamma^2} u_t.$$

Commitment

Solution under commitment found by minimizing L_t with respect to both π_t and π_t^e, which gives the following first-order conditions

(1.7) $$(\pi_t - \pi^*) + \gamma\lambda(y_t - y^*) + \theta_{t-1} = 0$$

(1.8) $$E_{t-1}[-\gamma\lambda(y_t - y^*)] - \theta_{t-1} = 0$$

where θ_{t-1} is the Lagrange multiplier corresponding to (1.2).
These give the following outcome:

$$\pi_t = \pi^* - \frac{\lambda\gamma}{1+\lambda\gamma^2} u_t, \tag{1.9}$$

$$y_t = \frac{1}{1+\lambda\gamma^2} u_t. \tag{1.10}$$

[An alternative way derive the optimal policy under commitment, is to assume that the central bank commits to an "inflation rule" of the form

$$\pi_t = a - bu_t \tag{1.11}$$

Inserting this in (1.3), making use of (1.1) and (1.2), and minimising with respect to *a* and *b* gives

$$a = \pi^*, \quad b = \frac{\lambda\gamma}{1+\lambda\gamma^2}.$$

Solutions to the time-inconsistency problem

A. Reputation

- "trigger strategy
    - . Barro and Gordon (1983b).

- uncertainty about the type of central bank
    - Backus and Driffil (1985

B. Delegation

As a compromise between credibility and flexibility, Rogoff (1985) suggested that the government should appoint a "conservative" central banker, that is, a central banker with the following preferences:

$$(1.12) \qquad L_t^{cb} = \frac{1}{2}[(\pi_t - \pi^*)^2 + \lambda^{cb}(y_t - y^*)^2],$$

where λ^{cb} is the central banker's subjective weight attached to output stability, $\lambda^{cb} < \lambda$,

C. Optimal contracts

- Walsh (1995) and Persson and Tabellini (1993)

(1.13)

$$L_t^{cb} = \frac{1}{2}[(\pi_t - \pi^*)^2 + \lambda(y_t - y^*)^2] + c\pi_t,$$

- Svensson (1997)

(1.14) $$L_t = \frac{1}{2}[(\pi_t - \pi^g)^2 + \lambda(y_t - y^*)^2]$$

Inflation in Norway and USA