

The Inflation Game: Rules vs Discretion (Current Controversies in Monetary Policy)

Questions

Modern Macroeconomics — ISCTE–IUL — May 2014

A. Assume that the Central Bank's loss function is given by the function:

$$L = \phi(u - u^*) + \gamma(\pi - \pi^*)^2$$

u is the unemployment rate, π is the inflation rate, and ϕ and γ are parameters. The asterisk represents the desired values for each variable.

We know that $\phi = 0.25$, $\gamma = 4$ and that the behavior of the supply side of the economy can be described by the following Phillips curve:

$$u = u^n - \alpha(\pi - \pi^e)$$

where u^n is the natural level of unemployment, π^e is the level of expected inflation, and $\alpha = 1.5$. Finally assume that private agents have rational expectations

$$\pi^e = \pi.$$

1. Explain the choices of the central bank that are represented in its loss function above.
2. Assume that the central bank desired level for inflation is 0%. Determine the level of optimal inflation in the case of discretionary behavior by the central bank.
3. Determine the same as in the previous question, but now having the central bank displaying commitment to maintain inflation at the level of its natural rate.
4. Explain why the result in (3) is better than the result in (2).
5. Assume that due to some external force the central bank is obliged to act under discretion (no commitment). What is the option available to the central bank in order to achieve zero inflation? Explain.

B. Assume that the Central Bank's loss function is given by the quadratic function:

$$L = u^2 + \gamma\pi^2$$

u is the unemployment rate, γ is a parameter, and π is the inflation rate. We know that $\gamma = 2.5$ and that the behavior of the supply side of the economy can be described by the following Phillips curve:

$$u = u^n - \alpha(\pi - \pi^e)$$

where u^n is the natural level of unemployment, π^e is the level of expected inflation, and $\alpha = 15$. Finally assume that private agents have rational expectations

$$\pi^e = \pi.$$

1. Determine the level of optimal inflation in the case of discretionary behavior by the central bank.
2. Determine the same as in the previous question, but now having the central bank displaying commitment to maintain inflation at the level of its natural rate.
3. Explain why the result in (2) is better than the result in (1).
4. Explain either by your own words, or by some sophisticated approach, what would happen in both scenarios above, if private agents had adaptive expectations instead of rational expectations. (not covered this year, BUT FOR THOSE WHO KNOW THE ESSENCE OF ADAPTIVE EXPECTATIONS, THE ANSWER IS EASY. With adaptive expectations, private agents formulate expectations using only information from the past, so they do not take into consideration any target for inflation that the central bank may announce)

C. Assume that the Central Bank's loss function is given by the following function:

$$L = \beta(u - u^*) + \gamma(\pi - \pi^*)^2$$

u is the unemployment rate, γ, β are parameters, and π is the inflation rate. An asterisk is used to represent the central bank's desired values for each variable.

We know that the behavior of the supply side of the economy can be described by the following Phillips curve:

$$u = u^n - \alpha(\pi - \pi^e)$$

where u^n is the natural level of unemployment, π^e is the level of expected inflation, and $\alpha = 15$. Finally assume that private agents have rational expectations

$$\pi^e = \pi.$$

1. Explain the logic behind the Loss function above, as far as the targets of the central bank are concerned.
2. Assuming that $u^* = 4, \pi^* = 0$, determine the level of optimal inflation in the case of discretionary behavior by the central bank.
3. Determine the same as in the previous question, but now having the central bank displaying commitment to maintain inflation at the level of its natural rate.
4. Explain why the result in (2) is better than the result in (1).
5. What is the condition that should hold in order to have the same result in both scenarios: discretion and commitment. Explain.