14.462 Lecture Notes
Commitment, Coordination, and Expectation Traps

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1 Kydland Prescott/Barro Gordon

A large number of private agents play against a government.

The government solves

$$\min L = \left\{ (y - y^*)^2 + \beta \pi^2 \right\}$$

subject to the Philips curve

$$y = \overline{y} + \alpha(\pi - \pi_e) - \varepsilon.$$

The shock ε is distributed uniform over $[-e, +e]$

The agents solve

$$\min \mathbb{E} \left(\pi_e - \pi \right)^2$$

The agents move first, setting π^e without observing ε. Nature then draws ε. The government moves last, setting π after observing ε and taking π^e as given.

The best response of the government is given by

$$\pi = g(\pi_e, \varepsilon) = \frac{\alpha\left(y^* - \overline{y} + \varepsilon\right) + \alpha^2\pi_e}{\alpha^2 + \beta}.$$

Note that $g(0,0) > 0$ and $g_\pi(\pi, \varepsilon) = \frac{\alpha^2}{\alpha^2+\beta} \in (0,1)$. The best response for the agents is

$$\pi_e = \mathbb{E}\pi$$

Hence, in equilibrium,

$$\pi_e = \mathbb{E}g(\pi_e, \varepsilon) = \frac{\alpha\left(y^* - \overline{y}\right) + \alpha^2\pi_e}{\alpha^2 + \beta} \equiv G(\pi_e).$$

By the properties of g, we have $G(0)$ and $G' \in (0,1)$. Hence, there is a unique fixed point with $\pi_e > 0$. Indeed, this is given by

$$\pi_e = \frac{\alpha\left(y^* - \overline{y}\right)}{\beta}.$$

It follows that equilibrium inflation is

$$\pi = \pi_e + \frac{\alpha}{\alpha^2 + \beta}\varepsilon$$

and equilibrium output is

$$y = \overline{y} + \frac{\alpha^2}{\alpha^2 + \beta}\varepsilon.$$

2 Obstfeld (1994)

We now reinterpret π as the rate of devaluation. We also modify the preferences of the government so that the government solves

$$\min L = \left\{(y - y^*)^2 + \beta\pi^2 + \theta R\right\}$$

subject to the Philips curve, where R is an indicator that takes the value 1 if $\pi \neq 0$ and 0 if $\pi = 0$. The variable θ represents the value of maintaining the peg.

The timing is the same. The government chooses π after observing ε and after agents have set π_e.

If the government sets $\pi = g(\pi_e, \varepsilon)$, then welfare losses are given by

$$L = L_{flex}(\pi_e, \varepsilon) = \frac{\beta}{\alpha^2 + \beta} (y^* - \overline{y} + \varepsilon + \alpha\pi^e)^2 + \theta.$$

If instead the government sets $\pi = 0$, then welfare losses are given by

$$L = L_{fixed}(\pi_e, \varepsilon) = (y^* - \overline{y} + \varepsilon + \alpha\pi^e)^2$$

Define $\underline{\varepsilon} = \underline{\varepsilon}(\pi_e)$ and $\overline{\varepsilon} = \overline{\varepsilon}(\pi_e)$ as the lowest and highest solution to

$$L_{flex}(\pi_e, \varepsilon) = L_{fixed}(\pi_e, \varepsilon).$$

Whenever $\varepsilon \in [\underline{\varepsilon}, \overline{\varepsilon}]$, the government finds it optimal to set $\pi = 0$ (fixed). Whenever $\varepsilon \notin [\underline{\varepsilon}, \overline{\varepsilon}]$, the government prefers to set $\pi = g(\pi_e)$ (flexibility).

Now consider the equilibrium. In equilibrium,

$$\pi^e = \mathbb{E}\pi = 0 \cdot \Pr(\varepsilon \in [\underline{\varepsilon}, \overline{\varepsilon}]) + \mathbb{E}g(\pi_e, \varepsilon) \cdot \Pr(\varepsilon \notin [\underline{\varepsilon}, \overline{\varepsilon}]) \equiv G(\pi_e)$$

Note that as π_e increases, the interval $[\underline{\varepsilon}, \overline{\varepsilon}]$ shifts down. It can be shown that $G(0) > 0$, $G' > 0$ and, over some range, $G' > 1$. Hence, G may possibly have either a unique of multiple fixed points, depending on the value of θ.

The graph of G is illustrated in Figure 1. For θ either small enough or large enough, the unique equilibrium is unique. But for intermediate value of θ, there are multiple equilibria. In particular, for intermediate θ, there are three equilibria, represented by points A, B, and C in the figure. In point C, the peg is always abandoned. In point A, the peg is abandoned only for very extreme shocks. The equilibrium in C thus represents an "expectations trap". On the other hand, only the "bad" equilibrium (C) survives for θ small enough, whereas only the "good" equilibrium (A') survives for θ high enough.

Discuss the role of coordination and the role of commitment.

Discuss Albanesi, Chari and Christiano (2000).

Discuss Fisher (19??).

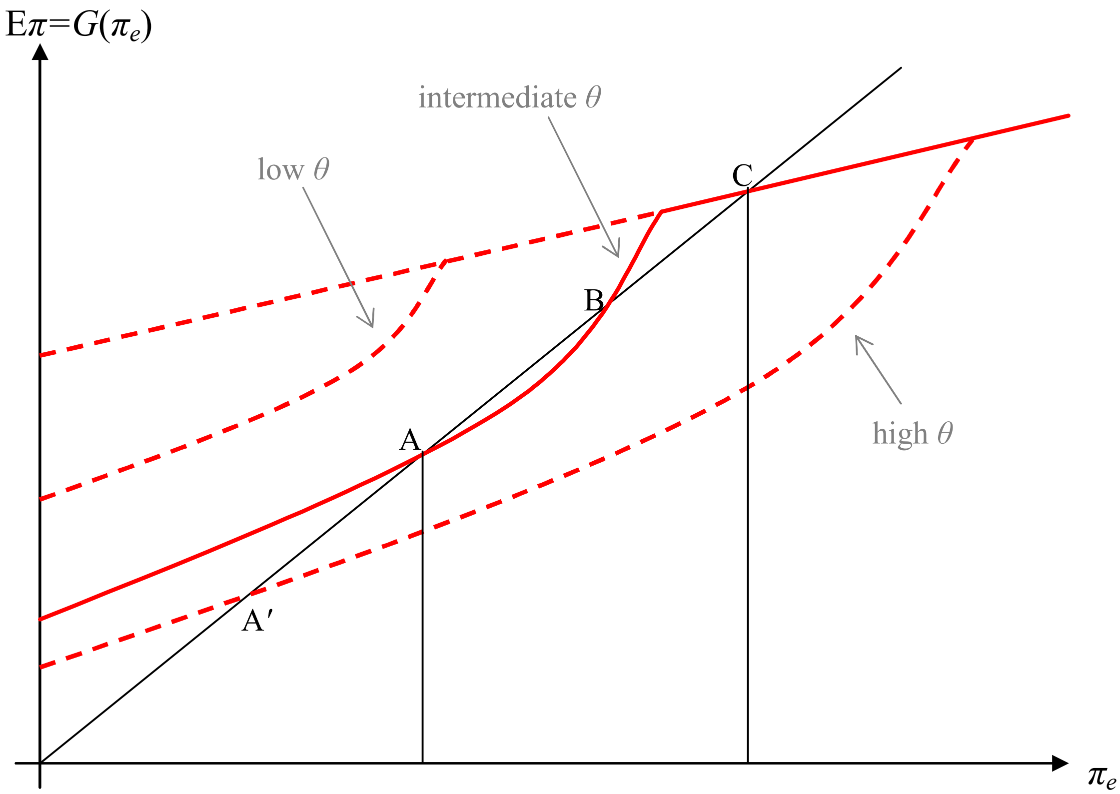

Figure 1: