Lista 2 - Macroeconomia II

Prof. Márcio Garcia

Monitor: Julio de Alencastro G. Mereb

10.5. Policy rules, rational expectations, and regime changes. (See Lucas, 1976, and Sargent, 1983.) Suppose that aggregate supply is given by the Lucas supply curve, $y_t = \overline{y} + b(\pi_t - \pi_t^e)$, $b > 0$, and suppose that monetary policy is determined by $m_t = m_{t-1} + a + \varepsilon_t$, where ε is a white-noise disturbance. Assume that private agents do not know the current values of m_t or ε_t; thus π_t^e is the expectation of $p_t - p_{t-1}$ given $m_{t-1}, \varepsilon_{t-1}, y_{t-1}$, and p_{t-1}. Finally, assume that aggregate demand is given by $y_t = m_t - p_t$.

(*a*) Find y_t in terms of m_{t-1}, m_t, and any other variables or parameters that are relevant.

(*b*) Are m_{t-1} and m_t all one needs to know about monetary policy to find y_t? Explain intuitively.

(*c*) Suppose that monetary policy is initially determined as above, with $a > 0$, and that the monetary authority then announces that it is switching to a new regime where a is 0. Suppose that private agents believe that the probability that the announcement is true is ρ. What is y_t in terms of m_{t-1}, m_t, ρ, $\overline{y}$, b, and the initial value of a?

(*d*) Using these results, describe how an examination of the money-output relationship might be used to measure the credibility of announcements of regime changes.

10.8. Solving the dynamic-inconsistency problem through punishment. (Barro and Gordon, 1983.) Consider a policymaker whose objective function is $\sum_{t=0}^{\infty} \beta^t (y_t - a\pi_t^2/2)$, where $a > 0$ and $0 < \beta < 1$. y_t is determined by the Lucas supply curve, (10.10), each period. Expected inflation is determined as follows. If π has equaled $\hat{\pi}$ (where $\hat{\pi}$ is a parameter) in all previous periods, then $\pi^e = \hat{\pi}$. If π ever differs from $\hat{\pi}$, then $\pi^e = b/a$ in all later periods.

(*a*) What is the equilibrium of the model in all subsequent periods if π ever differs from $\hat{\pi}$?

(*b*) Suppose π has always been equal to $\hat{\pi}$, so $\pi^e = \hat{\pi}$. If the monetary authority chooses to depart from $\pi = \hat{\pi}$, what value of π does it choose? What level of its lifetime objective function does it attain under this strategy? If the monetary authority continues to choose $\pi = \hat{\pi}$ every period, what level of its lifetime objective function does it attain?

(*c*) For what values of $\hat{\pi}$ does the monetary authority choose $\pi = \hat{\pi}$? Are there values of a, b, and β such that if $\hat{\pi} = 0$, the monetary authority chooses $\pi = 0$?

10.11. More on solving the dynamic-inconsistency problem through reputation. (This is based on Cukierman and Meltzer, 1986.) Consider a policymaker who is in office for two periods and whose objective function is $E[\sum_{t=1}^{2} b(\pi_t - \pi_t^e) + c\pi_t - a\pi_t^2/2]$. The policymaker is chosen randomly from a pool of possible policymakers with differing tastes. Specifically, c is distributed normally over possible policymakers with mean $\overline{c}$ and variance $\sigma_c^2 > 0$. a and b are the same for all possible policymakers.

The policymaker cannot control inflation perfectly. Instead, $\pi_t = \hat{\pi}_t + \varepsilon_t$, where $\hat{\pi}_t$ is chosen by the policymaker (taking π_t^e as given) and where ε_t is normal with mean 0 and variance $\sigma_\varepsilon^2 > 0$. ε_1, ε_2, and c are independent. The public does not observe $\hat{\pi}_t$ and ε_t separately, but only π_t. Similarly, the public does not observe c.

Finally, assume that π_2^e is a linear function of π_1: $\pi_2^e = \alpha + \beta\pi_1$.

(*a*) What is the policymaker's choice of $\hat{\pi}_2$? What is the resulting expected value of the policymaker's second-period objective function, $b(\pi_2 - \pi_2^e) + c\pi_2 - a\pi_2^2/2$, as a function of π_2^e?

(*b*) What is the policymaker's choice of $\hat{\pi}_1$ taking α and β as given and accounting for the impact of π_1 on π_2^e?

(*c*) Assuming rational expectations, what is β? (Hint: Use the signal extraction procedure described in Section 6.2.)

(*d*) Explain intuitively why the policymaker chooses a lower value of $\hat{\pi}$ in the first period than in the second.

10.14. The political business cycle. (Nordhaus, 1975.) Suppose the relationship between unemployment and inflation is described by $\pi_t = \pi_{t-1} - \alpha(u_t - \overline{u}) + \varepsilon_t^S$, $\alpha > 0$, where the ε_t^S's are i.i.d., mean-zero disturbances with cumulative distribution function $F(\bullet)$. Consider a politician who takes office in period 1, taking π_0 as given, and who faces reelection at the end of period 2. The politician has complete control over u_1 and u_2, subject only to the limitations that there are minimum and maximum feasible levels of unemployment, u_L and u_H. The politician is evaluated based on u_2 and π_2; specifically, he or she is reelected if and only if $\pi_2 + \beta u_2 < K$, where $\beta > 0$ and K are exogenous parameters. If the politician wants to maximize the chances of reelection, what value of u_1 does he or she choose?