Macroeconomics A

Problem set 8

This problem set will be collected at the beginning of the next class and marked. If you cannot make it to class you are advised to hand your solutions in before the deadline. No solution will be accepted after the deadline.

In what follows assume that the aggregate supply and demand curves (in logs) are given by

$$\text{AS } y_t = \alpha \left(p_t - E_{t-1} p_t \right)$$
$$\text{AD } y_t = m_t - p_t + v_t$$

The expectation operator E_{t-1} implies that private agents form their expectations on the basis of all information available up to the *beginning* of the previous period, but not the current one.

1. Assume that $v_t = v_{t-1} + \epsilon_t$ where ϵ_t is a random error with zero mean and variance σ_ϵ^2. The policy maker observes shocks with just one period delay. So at time t it cannot observe v_t but does observe v_{t-1}. The policymaker follows the linear policy rule $m_t = \bar{m} + \gamma_0 v_{t-1} + \gamma_1 v_{t-2}$ Calculate the values of γ_0 and γ_1 that minimize the variance of output.

2. Assume that v_t is a white noise random error with zero mean and variance σ_v^2. The government observes an imperfect measure u_t of the current demand shock v_t, with $u_t = v_t + e_t$ where e_t is an independent error with zero mean and variance σ_e^2. The government is aware that u_t is an imperfect measure of the true demand shock and does know σ_v^2 and σ_e^2. The government follows the linear policy rule $m_t = \bar{m} - \gamma u_t$. Calculate the value of γ that minimizes the variance of output.

   Hint: in working out the variance of output keep in mind that $\text{Cov}(u_t, v_t) \neq 0$.

3. The Lucas-Sargent-Wallace policy ineffectiveness proposition implies that anticipated changes in policy have no real effects. Discuss in no more than one page the role of each of the assumptions underlying it, supporting your claims with graphs. On the basis of what we have seen in the Ramsey model argue whether the proposition should apply also to fiscal policy (Hint: consider an announced increase in government expenditure. Does it affect output and the real interest rate?)