

Problem Set #8

Econ 381, Prof. Evans

Due Monday, Nov. 10, 4:30 p.m.

NOTE: You are encouraged to work on this problem set in a group of up to four members. When finished, each group should turn in one copy of the problem set to the class inbox in 130 FOB. Each completed problem set should list the names of the group members who worked on the assignment. As noted in the syllabus, no late assignments will be graded.

1. **Chapter 14, Time inconsistency problem (4 points):** Assume that the unemployment rate u in period t in an economy is given by the following equation:

$$u_t = \bar{u} - \alpha(\pi_t - \pi_t^e) \quad \text{where } \alpha > 0$$

where \bar{u} is the natural rate of unemployment, π_t is the inflation rate in period t , and π_t^e is expected inflation in period t . Assume that household's inflation expectations π_t^e are formed before actual inflation π_t is realized. Assume that the monetary authority in this economy can perfectly control the inflation rate π_t and chooses the inflation rate π_t that minimizes the following loss function in each period:

$$L_t(u_t, \pi_t) = (u_t - \bar{u})^2 + \gamma\pi_t^2 \quad \text{where } \gamma > 0$$

In summary, the timing of this model is the following: (i) households form expectations about inflation π_t^e , (ii) the monetary authority chooses the actual level of inflation π_t , and (iii) the unemployment rate u_t is determined by the levels of actual inflation π_t and expected inflation π_t^e .

- (a) Derive the optimal inflation rate π_t for the monetary authority given inflation expectations such that $\pi_t^e \neq \pi_t$, in general.
- (b) Assume that households have adaptive inflation expectations such that $\pi_t^e = \pi_{t-1}$. What is the incentive for the monetary authority? Why do they do this?
- (c) Give a functional form for what rational expectations means in this model. That is, if agents know that monetary authority's loss function $L_t(u_t, \pi_t)$ what does rational expectations imply that expected inflation π_t^e is equal to?
- (d) If households have rational expectations, what is the optimal inflation rate set by the monetary authority? Why?

2. **Chapter 14, Stabilization policy and its limitations (2 points):**
- (a) Define the inside lag and the outside lag.
 - (b) List which lag is longer with regard to monetary policy M and fiscal policy G and which type of lag is longer between the two types of stabilization policy.
 - (c) What types of shocks would each type of stabilization policy be best suited to respond to?
 - (d) What types of advancements or institutional changes might shorten each type of lag?
3. **Chapter 15, Effects of deficit spending (4 points):** Assume that Ricardian equivalence does not hold. Also, by way of definition, an increase in government spending $G \uparrow$ means an increase in the budget deficit, other things being equal.
- (a) Using the classical model of Chapter 3, what is the effect of increased government spending in the long run?
 - (b) Using the Solow growth model of Chapter 7, how do the long-run effects described in the previous question affect the steady state capital stock and steady state output?
 - (c) Previous to the increase in government spending, if the steady state capital stock were below the Golden Rule steady state capital stock level, what would the increase in government spending do to steady state consumption?
 - (d) Using the IS-LM model described in Chapters 10 and 11, describe the short run effects of the increase in government spending?
 - (e) Given what you know now about the effects of increasing the budget deficit by increasing government spending—both short-run and long-run effects—would you recommend that Congress increase government spending?