

# ECON 5110 Final Exam

Spring 2014

1. **Money Demand and Expectations.** (40 pts) Consider the simple money demand function

$$\frac{M_t}{P_t} = \left( \frac{E_t P_{t+1}}{P_t} \right)^\alpha \quad (1)$$

where the money supply follows  $M_t = M \exp(\epsilon_t)$ ,  $M$  is a constant,  $\epsilon_t$  is mean-zero white noise and  $\alpha < 0$ .

- (a) (10 pts) Solve for the steady state values,  $M$  and  $P$ .
- (b) (10 pts) Linearize the system and write equation (1) in our standard forward-looking representation,  $y_t = bE_t y_{t+1} + c x_t$ . Denote percentage deviations from steady state in lower case. [Hint: To linearize the system and write the variables in percentage deviation from steady state, you can either perform a first-order Taylor series approximation (e.g.,  $p_t = (P_t - P)/P$ ) or log linearize the variables (e.g.,  $p_t = \ln P_t - \ln P = \ln(P_t/P)$ ).
- (c) (10 pts) Find the equilibrium under naïve expectations,  $E_t P_{t+1} = P_{t-1}$ . Use a graph with a 45-degree line to describe the transition dynamics and steady state.
- (d) (10 pts) Find the rational expectations equilibrium (REE). Is the REE regular (“determinate”) or irregular (“indeterminate”)? Explain.

2. **Dynamic New Keynesian (DNK) Model.** (30 pts) Consider the following DNK model,

$$x_t = -\varphi[i_t - E_t \pi_{t+1}] + E_t x_{t+1} + \epsilon_t \quad (\text{IS curve})$$

$$\pi_t = \lambda x_t + \gamma E_t \pi_{t+1} + \mu_t \quad (\text{Phillips curve})$$

$$i_t = i + \theta_x E_t x_{t+1} + \theta_\pi E_t \pi_{t+1} \quad (\text{Taylor rule})$$

where the variable definitions are the same as those discussed in class.

- (a) (15 pts) Let the household objective function be

$$E_t \sum_{i=0}^{\infty} \beta^{t+i} (1 - \sigma)^{-1} c_{t+i}^{1-\sigma}.$$

Briefly discuss the behavior of  $\varphi$  as  $\sigma \rightarrow 0$ . What does this imply for the slope of the IS curve? Will monetary policy be more or less effective in stabilizing output?

- (b) (15 pts) Discuss the Taylor principle and how it relates to the magnitude of  $\theta_\pi$ . Provide some economic intuition for the stabilizing effects of a central bank that follows the Taylor principle.

3. **Miscellaneous Questions.** (30 pts – 15 points each) Answer TWO of the three following questions.

- (a) (15 pts) Why are overlapping wage contracts an important mechanism for explaining the business cycle? In particular, how are the dynamics of the model different from the case where wage contracts do not overlap.
- (b) (15 pts) Describe how the Diamond (1982) search model could be used to explain the business cycle.
- (c) (15 pts) In your estimation, what is the primary cause of the Great Depression? What is the propagation mechanism in the economy that lead to the dramatic fall in output and the slow recovery.