

ECON 5110 Final Exam

Spring 2008

1. **Money Demand, Expectations and Learning.** (50 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 and ϵ_t is mean-zero white noise.

- (a) (10 pts) Linearize the system and write equation (1) in our standard forward-looking representation. Denote percentage deviations from steady state in lower case.
- (b) (10 pts) Find the equilibrium under naive expectations. Does this equilibrium make intuitive sense? Explain.
- (c) (10 pts) Find the rational expectations equilibrium (REE).
- (d) (10 pts) What parameter values would lead to an indeterminate equilibrium? What would this imply about the demand for money?
- (e) (10 pts) Under what conditions is the REE stable under least squares learning?

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) (10 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 φ as $\sigma \rightarrow \infty$. What does this imply for the slope of the IS curve? Will monetary policy be more or less effective in stabilizing output?

- (b) (10 pts) Assume the Phillips curve is derived from a Calvo-style sticky price model where the probability of changing price in any period is given by $(1 - \nu)$. Briefly discuss the behavior of λ as $\nu \rightarrow 0$. What does this imply for the slope of the Phillips curve and the macro effects of demand-side shocks ϵ_t ?
- (c) (10 pts) Discuss the Taylor principle and how it relates to the magnitude of θ_π . Provide some economic intuition for the stabilizing effects of a central bank that follows the Taylor principle.

3. **Miscellaneous Questions.** (20 pts) Answer TWO of the four following questions.

- (a) (10 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) (10 pts) Describe in words why optimal monetary policy is time inconsistent and why discretion may lead to suboptimal outcomes.
- (c) (10 pts) What are the fundamental differences between the sticky-price and sticky-information models of the business cycle?
- (d) (10 pts) 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.