Economics 205C
Spring 2017

Final exam

Part A: Answer one (1) question from this part.

1. Consider a standard new Keynesian model with sticky wages and flexible prices. Wages adjust according to a simple Calvo model, so that

$$\pi_t^w = \beta \mathrm{E}_t \pi_{t+1}^w + \kappa x_t + e_t,$$

where π_t^w is nominal wage inflation, x_t is the gap between output and the flexible-wage equilibrium output level, and e_t is an exogenous shock. Flex-wage, flex-price output is a function of z_t, an exogenous aggregate productivity shock.

   (a) If π_t is price inflation, is

$$\frac{1}{2}\mathrm{E}_t \sum_{i=0}^{\infty} \beta^i \left[\pi_{t+i}^2 + \lambda_x x_{t+i}^2\right]$$

   the appropriate welfare-based loss function that the central bank should attempt to minimize? If not, what loss function should the central bank minimize? Explain.

   (b) Given the loss function you indicated in part (a) that the central bank should minimize, derive the central bank's optimal targeting criterion (i.e., its first-order condition after eliminating any Lagrangian multipliers) under optimal discretion. What is the optimal targeting criterion under optimal commitment from a timeless perspective? Carefully explain why the two criterion differ.

   (c) In the face of wage inflation shocks (i.e., e_t), *explain* how the optimal commitment policy achieves a better trade off between wage inflation and output gap stability than is achieved under optimal discretion.

   (d) In the face of productivity shocks, *explain* why the optimal commitment and optimal discretionary policies both achieve the same outcomes.

   (e) Assume the log linearized marginal product of labor is equal to the productivity shock z_t. For the situations described in part ~~(b)~~ c and in part ~~(c)~~ d and starting with $z_{t-1} = 0$, what happens to price inflation under discretion in response to e_t shocks and to z_t shocks?

2. Let $V_{t,t+1}(s)$ be the price of a claim that pays one unit of domestic currency at $t+1$ in state s, $\tilde{p}(s)$ the probability of state s, P_t the price level, and $C_t^{-\sigma}$ the marginal utility of consumption.

   (a) Explain why we expect

$$\left(\frac{V_{t,t+1}(s)}{P_t}\right) C_t^{-\sigma} = \tilde{p}_{t+1}(s)\beta\left(\frac{1}{P_{t+1}(s)}\right) C_{t+1}^{-\sigma}(s) \tag{1}$$

   to hold.

   (b) If S_t is the nominal exchange rate (price of foreign currency in terms of domestic currency) and P_t^* is the foreign price index, what parallel condition should hold if foreign residents can also purchase the same state contingent claim?

(c) With a complete set of state contingent claims, show your results in (b), together with (1), imply

$$C_t = vQ_t^{\frac{1}{\sigma}}C_t^*,$$

where $Q_t \equiv S_t P_t^*/P_t$ is the real exchange rate.

(d) Use these results to obtain the (linearized) uncovered interest rate parity condition. Provide an economic intuition to explain this condition.

Part B: Answer two (2) question from this part.

1. Suppose the economy experiences a negative aggregate demand shock that pushes the nominal interest rate to zero.

   (a) *Carefully explain* how increased pessimism about how long the economy will be at the zero lower bound will affect the current equilibrium output gap and inflation.

   (b) *Carefully explain* how promising to keep the nominal interest rate at zero after the zero lower bound constraint is no longer binding can affect the current equilibrium.

2. This question deals with the DMP search and matching model of the labor market.

   (a) The basic DMP model consists of three components. Carefully describe each component (no equations necessary).

   (b) In a dynamic version of the DMP model, *carefully explain* how a rise in the real interest rate would affect the firm's incentive to post a job vacancy.

3. Consider a bank with assets $A_t + B_t$ and liabilities D_t, where A represents loans, D deposits and B holdings of government bonds. Let N be bank capital, so the bank's balance sheet is $A_t + B_t = D_t + N_t$. Assume the bank owners can potentially remove some of the bank's assets for their own use and let the bank fail. Specifically, assume they can divert a fraction θ of $A_t + \omega B_t$, where $0 \leq \omega \leq 1$. Let V equal the continuation value of the bank (i.e., the present discounted value of profits the bank earns by remaining in business).

   (a) Explain in words why depositors will only provide funds to the bank as long as $V_t \geq \theta(A_t + \omega B_t)$. What would happen if $V_t < \theta(A_t + \omega B_t)$?

   (b) Let $R_{a,t}$ be the gross return on assets, $R_{b,t}$ the gross return on bonds, and $R_{d,t}$ the gross cost on deposits. If the bank maximizes profits subject to the incentive constraint $V_t \geq \theta(A_t + \omega B_t)$, under what conditions will $R_{a,t} = R_{b,t} = R_t$? Under what conditions will $R_{a,t} - R_t > R_{b,t} - R_t > 0$?