PRELIMINARY EXAMINATION FOR THE Ph.D. DEGREE

Instructions: Answer any 3 of the following 4 questions.

Question 1: Dynamic analysis

Take a short-run macro model where price is fixed, and assume perfect capital mobility and a floating exchange rate regime. The model is described by the three equations below. All variables are in log form, except for the interest rate which is expressed in fractional decimal (e.g. instead of 10 percent, we write 0.1). All coefficients are positive numbers

$$\dot{y} = \beta[a_1 g - a_2 r + a_3(e - p) - y]$$
$$m - p = l_0 - l_1 r + l_2 y$$
$$r = r^* + \dot{e}$$

(a) Use algebraic analysis to show the comparative static results of an unexpected permanent increase in r*. Be sure to show the results in an e-y diagram.

(b) There is no need for you to solve for the eigenvalues of the system. Use phase arrows to show the dynamics around the equilibrium in the preceding e-y diagram. You have to first derive the slope of the $\dot{y}$ and $\dot{e}$ equations.

(c) Use the phase arrows in the e-y diagram to show the dynamic path of adjustment after an unexpected permanent increase in r*.

Question 2: Exchange rate management

Economists generally believe that prices should be determined by supply and demand without government intervention. But yet, there are quite a number of prominent economists who advocate that the government intervene actively in the foreign exchange market to set the price of its currency. Some would go as far to argue that, if necessary, capital controls should also be used to allow the government to set the exchange rate.

(a) Under what technical condition is capital control a necessary instrument for the central bank to set the exchange rate? State and evaluate the case for a fixed exchange rate regime. (Hint: It would be helpful to include a discussion of the optimum currency area literature, and the empirical evidence about its relevance.)

(b) Show analytically that speculative mania is compatible with rational expectations, if you can. Otherwise, an example from a specific model would also do.

(c) Provide one analytical explanation for why exchange rate movements for low inflation countries have tended to exhibit random walk characteristics.

Question 3: Intertemporal current account theories

Consider the problem of a small open economy with an infinitely-lived representative agent that consumes traded and nontraded goods:

$$Max \quad \sum_{s=t}^{\infty} \beta^{s-t} U\left(C_{T,s}, C_{N,s}\right)$$

s.t.

$$B_{s+1} - B_s = Y_s + r_s B_s - \left(C_{T,s} + p_s C_{N,s}\right) \equiv CA_s$$

$$where \quad U\left(C_{T,s}, C_{N,s}\right) = \frac{1}{1-\sigma}\left(C^{\theta}_{T,s} C^{1-\theta}_{N,s}\right)^{1-\sigma}$$

$$and \quad Y_s \equiv Y_{T,s} + p_s Y_{N,s}$$

C_T is consumption of traded goods, C_N is consumption of nontraded goods, and p is the relative price of nontraded goods in terms of traded goods. B_{t+1} is a riskless bond, with a net return r_{t+1} known in period t, denominated in units of the traded good. Assume the endowments of traded and nontraded goods (Y_T and Y_N, respectively) are exogenously determined, assume that r is exogenous but potentially time varying, and assume $\sigma = 3$.

(a) Set up the dynamic programming problem and derive an *inter*temporal optimality condition between periods and the *intra*temporal optimality condition between traded versus nontraded goods.

(b) Suppose the economy has been in a steady state with a zero current account balance and zero net foreign assets; now there is a temporary shock that raises the endowment of nontraded goods available for consumption this period (a one-period rise in Y_N). Discuss whether the current account will rise, fall, not change, or if it is ambiguous. What if the rise in Y_N were permanent?

(c) Suppose the economy has been in a steady state with a zero current account balance and <u>positive</u> net foreign assets; now there is a temporary shock that raises the world interest rate. Discuss whether the current account will rise, fall, not change, or if it is ambiguous.

(d) In 2-3 paragraphs discuss the main results of the empirical literature testing intertemporal current account models.

Question 4: PPP and LOP

(a) Why do you think many open economy macroeconomists would like to believe in Purchasing Power Parity (PPP)? Describe the role that PPP plays in at least two prominent open economy models. (For example, choose a model of exchange rate determination and a model of monetary policy transmission, both of which rely on PPP.)

(b) Briefly list four distinct types of theoretical reasons why PPP and the law of one price (LOP) for individual goods both might fail in the data.

(c) In 3-4 paragraphs, summarize the main methods and conclusions of the literature testing PPP and LOP. Cite key papers in this literature.

(d) Consider a two-country model of monopolistically competitive firms, who face identical marginal costs of production, and who all face 10% iceberg transportation costs when exporting abroad. Assume symmetry across the two countries, with identical preferences over all goods. Discuss how well this type of model could account for long-run LOP and PPP deviations.