

WINTER 2002

INTERNATIONAL COMPREHENSIVE EXAM

BRITTO/NISHIYAMA

PART I. ANSWER 2 OF THE FOLLOWING 3.

1. Show that, in a two-country, two-good, two-factor model, increasing the size of one country (increasing both  $K$  and  $L$  in the same proportions) will change commodity prices, factor prices, outputs, and the volume of trade in both countries, but will not change the pattern of trade.
2. Write short notes on:
  - A. The factor-intensity-reversal assumption;
  - B. Trade diversion versus trade creation;
  - C. Shadow prices of factors in distorted economies.
3. "The introduction of imperfect competition into models of international trade has shown that countries might trade with one another for reasons other than those of comparative advantage."

Discuss with reference to some specific model that you have studied in your course in International Trade.

## PART II. ANSWER 2 OF THE FOLLOWING 3.

### Question 1: The Asian crisis

Consider the model by Corsetti et al. ("Paper tigers? A model of the Asian crisis," G. Corsetti, P. Pesenti, and N. Roubini, *European Economic Review* 43, 1999). A small country has the aggregate production function

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha}$$

where  $Y$  is output,  $K$  is capital,  $L$  is labor ( $L = 1$  is assumed), and  $A_t$  is a technology parameter for which  $A_t = A + \sigma$  with probability 0.5 and  $A_t = A - \sigma$  with probability 0.5 ( $A > \sigma > 0$  is assumed). The country's elite, who owns the country's entire capital and borrows from international investors, maximizes the following expected utility with respect to  $K$

$$E_t \sum_{s=t}^{\infty} \frac{1}{(1+r)^{s-t}} u(C_s)$$

where  $r$  is the constant world real interest rate,  $C$  is the elite's consumption, and  $u(C_s) = C_s$  is assumed. To simplify the model by Corsetti et al., assume the fixed exchange rate = 1 and  $P_t = 1$  for all  $t$  (where  $P$  indicates the price level). Then, the budget constraint of the elite is

$$K_{t+1} - K_t - (D_{t+1} - D_t) = \beta W_t - r D_t - C_t - T_t - (M_t - M_{t-1})$$

where  $D$  is the elite's gross foreign debt,  $\beta$  is the ratio of the elite population to the country's total population,  $W$  is country's before-tax labor income,  $W_t = (1-\alpha)Y_t$  is assumed,  $T$  is the elite's payment of taxes to the government (if  $T > 0$ ) or the elite's receipt of transfers from the government (if  $T < 0$ ), and  $M$  is the elite's money holdings.

Taking account of a possible government bailout in the form of current and future transfers, show the elite's first-order condition with respect to  $K_{t+1}$ . Then, based on the first-order condition, show how the moral hazard problem gives rise to overinvestment using a diagram where the vertical axis measures the world real interest rate and the expected marginal return on capital with or without expected current and future transfers, and the horizontal axis measures capital (i.e.,  $K_{t+1}$ ).

## Question 2: A monetary model of the exchange rate

Assume a simple monetary model of the exchange rate described by equations (1), (2) and (3) below.

- (1) Demand for money:  $m_t - p_t = -\eta i_t + \phi y_t$ .
- (2) Purchasing power parity (PPP):  $p_t = e_t + p^*_t$ .
- (3) Uncovered interest parity (UIP):  $i_t - i^*_t = E_t(e_{t+1} - e_t)$ .

All variables, except for the domestic and foreign interest rates ( $i_t$  and  $i^*_t$ , respectively), are in logs;  $m$  = money;  $y$  = real output;  $e$  = the exchange rate (the price of foreign currency in terms of home currency);  $p$  = the price level; \* indicates the foreign variable; and  $\eta > 0$  and  $\phi > 0$ . Consider the following money supply processes where  $\varepsilon_t$  is a serially uncorrelated shock with  $E_t \varepsilon_{t+s} = 0$  for all  $s \geq 1$ .

- (a)  $m_t = \rho m_{t-1} + \varepsilon_t$ .
- (b)  $m_t - m_{t-1} = \rho (m_{t-1} - m_{t-2}) + \varepsilon_t$ .

First, for each case ((a) and (b) above) separately, show the forward-looking solution for the exchange rate and then simplify the expression of the forward-looking solution by using the money supply process ((a) and (b) above). You must show the derivation step-by-step. Assume that  $0 < \rho < 1$ ;  $\phi y_s - \eta i^*_s + p^*_s = 0$  for all  $s$ ; and no speculative bubbles. Second, explain the difference between (a) and (b) in the impacts of a positive unanticipated shock (i.e.,  $\varepsilon_t > 0$ ) on the exchange rate.

### Question 3: Speculative attacks

Assume that the Thailand's economy is described by the continuous-time, two-country (Thailand and the U.S.), perfect-foresight Cagan model, (1) below, where prices are perfectly flexible and PPP holds always. (The notation -  $m$ ,  $p$  and  $e$  - is the same as those in Question 2 above.) Thailand is the home country with its currency baht and the foreign country is the U.S. with \* on its variable.

- (1) Money market equilibrium:  $m_t - p_t = -\eta \dot{p}_t$  where the dot indicates the time derivative.  
(2) PPP:  $p_t = e_t + p^*_t$  where  $p^*_t = 0$  is assumed.

Under two assumptions (i) no bubbles and (ii) a constant money growth rate of  $\dot{m} = \mu$ , the Cagan model yields a solution:

$$p_t = (1/\eta) \int_t^{\infty} m_s \exp(-(s-t)/\eta) ds.$$

Note that the lower-case letters indicate the logs of the corresponding upper-case letters and, therefore, (for example)  $\dot{x} = \dot{X} / X$ .

Suppose that the Thai central bank (CB) has to monetize the government budget deficit at a rate of  $\mu$ . Also, suppose that CB is determined to maintain the fixed exchange rate (as long as it holds dollar reserves).

- (A) Using the following notation, find the timing of the speculative attack on the Thai baht.  
(B) What is an important implication of the timing with respect to CB's initial amount of dollar holdings? You have to answer using equations. Use a diagram or diagrams for only an illustration purpose.

Notation for the CB balance sheet. (Use the lower-case letter for the log of each variable.)

$E$  = fixed exchange rate (units of baht per dollar)

$B_{F,t}$  = \$ reserves at time  $t$  (in dollars)

$B_{H,t}$  = domestic assets at time  $t$  (in baht)

$M_t$  = currency in circulation and Thai commercial banks' deposits at CB at time  $t$  (in baht).