

Economics 170

**International Macroeconomics**

Homework 7

Due April 4, 2008

**1. An Economy With Tradables and Non-Tradable Goods**

Consider a two-period, small, open economy. In period 1, households receive an endowment of 6 units of tradable goods and 9 units of nontraded goods. In period 2, households receive 13.2 units of tradables and 9 units of nontradables ( $Q_1^T = 6$ ,  $Q_2^T = 13.2$ , and  $Q_1^N = Q_2^N = 9$ ). Households start period 1 with no assets ( $B_0^* = 0$ ). The country enjoys free access to world financial markets, where the prevailing interest rate is 10 percent ( $r^* = 0.1$ ). Suppose that the demands for tradable and nontradable consumption goods in periods 1 and 2 are given by<sup>1</sup>

$$C_1^T = \frac{1}{2} \left[ Q_1^T + \frac{Q_2^T}{1+r_1} \right],$$

$$C_2^T = \frac{1+r_1}{2} \left[ Q_1^T + \frac{Q_2^T}{1+r_1} \right],$$

$$C_1^N = \frac{C_1^T}{p_1^N},$$

and

$$C_2^N = \frac{C_2^T}{p_2^N},$$

where  $p_t^N$  denotes the relative price of nontradable goods in terms of tradable goods in period  $t$  and  $C_t^T$  and  $C_t^N$  denote, respectively, consumption of tradable and nontradable goods in period  $t$ , for  $t = 1, 2$ .

- (a) Compute for period 1 the equilibrium levels of the current account balance and the relative price of nontradables in terms of tradables.
- (b) Calculate the net foreign asset position of the economy at the end of period 1,  $B_1^*$ .
- (c) Obtain for period 2 the equilibrium levels of the current account balance and the relative price of nontradables in terms of tradables. Explain intuitively why  $p_t^N$  changes over time.
- (d) Assume that the domestic consumer price index in period  $t = 1, 2$ , denoted  $P_t$ , is defined by  $P_t = \sqrt{P_t^T P_t^N}$ , where  $P_t^T$  and  $P_t^N$  denote the nominal prices of tradables and nontradables in period  $t$ , respectively. Similarly, suppose that the foreign consumer price index is given by  $P_t^* = \sqrt{P_t^{T*} P_t^{N*}}$ , where the superscript  $*$  denotes foreign variables. Foreign nominal prices are expressed in terms of foreign currency. Assume that PPP holds for tradable goods. Finally, suppose that the foreign relative price of nontradables in terms of tradables equals unity in both periods. Compute the real exchange rate in periods 1 and 2.

---

<sup>1</sup>As discussed in class, these demand functions arise when households preferences are described by a log-linear utility function, that is,  $U(C_1^T, C_1^N, C_2^T, C_2^N) = \ln C_1^T + \ln C_1^N + \ln C_2^T + \ln C_2^N$ .

- (e) **An External Crisis:** Let us sketch a scenario like the one that took place during the Argentine debt crisis of 2001 by assuming that because of fears that the country will not repay its debts in period 2, foreign lenders refuse to extend loans to the domestic economy in period 1. Answer the questions in items (a) through (d) under these new (adverse) circumstances. Compute the equilibrium interest rate. Provide an intuitive explanation of your results.
- (f) Compute real GDP in period 1 under the crisis and no-crisis scenarios. Consider two alternative measures of real GDP: GDP measured in terms of tradable goods and GDP measured in terms of the basket of goods whose price is the consumer price index  $P_1$ . What measure is more economically sensible? Why?
- (g) **Crisis Relief Policy:** Suppose the Inter American Development Bank (IADB) decided to implement a transfer (gift) to Argentina to ameliorate the effects of the external crisis. Specifically, suppose that the IADB gives Argentina a transfer of  $F$  units of tradable goods in period 1. Use the utility function given in footnote 1 to compute the size of  $F$  that would make Argentineans as happy as in the no-crisis scenario. Express  $F$  as a percentage of the country's crisis/no-aid GDP in period 1.