

Econ 8510/Chatterjee

Assignment 1

Due on: Wednesday, September 12

Points: 100

Question 1

Consider an open-economy version of the Cagan Monetary model. There are two economies, Home and Foreign (all foreign variables are marked with a "*"), and their respective money market equilibrium conditions are given by

$$m_t - p_t = \phi y_t - \lambda i_t + \varepsilon_t$$

$$m_t^* - p_t^* = \phi y_t^* - \lambda i_t^* + \varepsilon_t^*$$

where all variables except the interest rate are in logs. Assume that UIP and PPP holds for these countries.

i. Derive a forward-looking solution for the nominal exchange rate. In what sense is the exchange rate forward looking?

ii. Discuss how different components of the monetary fundamental affect the equilibrium exchange rate. Provide clear intuition for your answers.

[15+10=25]

Question 2

A representative agent in a small open economy maximizes intertemporal utility from the consumption of a private traded good:

$$\text{Maximize } \int_0^{\infty} u(c, l) e^{-\beta t} dt, \quad -\infty < \gamma < 1, \beta > 0$$

$$u_c > 0, u_{cc} < 0, u_l < 0, u_{ll} < 0$$

subject to a budget constraint

$$\dot{z} = c + (1 + \tau)i(z)z - T - f(l)$$

where c and l denote real consumption and labor supply, z is the stock of foreign debt accumulated by the agent, $f(l)$ is a neoclassical production function with the usual properties, while T and τ represent a lump-sum transfer and a tax on foreign borrowing. The cost of borrowing is given by an upward sloping supply curve of debt:

$$i(z) = i^* + \omega(z), \quad \omega' > 0$$

The agent considers itself too small to affect $i(z)$, which is eventually determined from the macroeconomic equilibrium. The government balances its budget by rebating tax revenues back to the agent through a lump-sum transfer:

$$\tau i(z)z = T$$

- i. Derive the macroeconomic equilibrium and show that the equilibrium dynamics are represented by a saddle path.
- ii. Consider an increase in β . Describe the dynamic response of this economy to this shock. Specifically, focus on the evolution of the marginal utility of wealth and the stock of foreign debt.
- iii. Suppose that a social planner was performing the above resource allocation exercise on behalf of the representative agent. What would be the corresponding macroeconomic equilibrium? Outline the key differences between the social planner's outcome and that of the representative agent.
- iv. Derive the optimal tax rate on foreign borrowing. What purpose does that tax rate serve?

[15+10+15+5=45]

Question 3

A basic problem with the one-sector open economy neoclassical growth model is that the dynamics of the model degenerate. Briefly discuss the source of this problem and the underlying rationale. Write a comprehensive review of the alternative approaches found in the literature that resolve this problem and restore dynamics in this model. Your review need not be technical, but should rely heavily on the intuition behind each approach and a discussion of their relative merits and demerits. You are expected to refer to the relevant papers and studies in the literature. At the end of your discussion, provide a list of references you consulted for this essay. The essay should be typed and not hand-written.

[30]