國立成功大學

115學年度碩士班招生考試試題

編　號：213

系　所：經濟學系

科　目：總體經濟學

日　期：0203

節　次：第 3 節

注　意：1.不可使用計算機
2.請於答案卷(卡)作答，於試題上作答，不予計分。

1. (30%) Consider a Solow model with Cobb-Douglas production function

$$Y = K^{\alpha} L^{1-\alpha},$$

where labor input L grows at a constant rate n. Suppose that consumers spend more under higher capital level. That is,

$$C = (1-s)Y + mK,$$

where $s \in (0,1)$ is the saving rate, and $m > 0$. Let δ be the depreciation rate.

   a) (10%) Draw the Solow diagram.

   b) (10%) Derive the steady state per capita capital ($k = K/L$), output ($y = Y/L$) and consumption ($c = C/L$).

   c) (10%) Suppose there is an increase in m. What are the effects on the steady state per capita capital, output, and consumption?

2. (10%) Consider a labor market with search. Firms post jobs and search for workers, while workers search for jobs. The fraction of workers that find jobs is p, which is an increasing function of the labor market tightness:

$$p = p(k), \quad \text{where } k = \frac{\text{number of jobs}}{\text{number of workers}}$$

The fraction of jobs that are filled, denoted by q, is a decreasing function of k:

$$q = q(k)$$

Suppose that regardless of whether a posted job is filled or not, firms need to pay a fixed costs, θ. The total surplus that a filled job generates is $y - b$, where y is the value generated by the worker and b is the value to the worker of being unemployed. It is assumed that the worker keeps a fraction β of the total surplus. In equilibrium, the expected value from posting a job equals to zero.

   a) (5%) Derive an implicit function of the labor market tightness, k, in terms of y, b, θ, and β.

   b) (5%) If θ increases, what happens to the unemployment rate u? Provide an economic intuition behind your findings.

3. (60%) Consider a small open economy in which a representative agent lives for two periods with two types of goods: crude oil and wheat. Each household receives Y_1 and Y_2 units of crude oil in each period; however, crude oil is inedible. Therefore, households export oil and import wheat for consumption. Suppose the export price of oil is P_t^X, and the import price of wheat is P_t^M. We can define the terms of trade (TOT) as:

$$\theta_t = \frac{P_t^X}{P_t^M}$$

The representative consumer maximizes the life-time utility

$$U(C_1, C_2) = \log C_1 + \beta \log C_2,$$

where $\beta \in (0, 1)$ represents the discount factor, and (C_1, C_2) denote consumptions in period 1 and 2, respectively. The representative consumer has access to a global financial market for both lending and borrowing. Let B_t denote the foreign bond holdings at the end of period $t-1$, and let r represent the world interest rate. Assume that $B_1 = 0$.

a) (5%) Write down the period-by-period budget constraints.

b) (5%) What is the Transversality condition in this two-period model?

c) (5%) Derive the intertemporal (life-time) budget constraint.

d) (5%) Find the optimal consumption (C_1) and current account balance (CA_1).

e) (5%) What happens to the optimal consumption (C_1) when the terms of trade deteriorates in the first period? Please provide the economic intuition behind your results.

f) (5%) What happens to the optimal current account balance (CA_1) when the terms of trade deteriorates in the first period? Please provide the economic intuition behind your results.

We now introduce import tariffs into our model and make the following assumptions:

- Import tariffs are fully passed on to households and can therefore be regarded as consumption taxes.
- The government transfers tariff revenue to households in a lump-sum manner.

Let (τ_1, τ_2) represent import tariff rates, and (T_1, T_2) represent the lump-sum transfer.

g) (5%) Write down the period-by-period budget constraints under tariffs.

h) (5%) Write down the lifetime budget constraint under tariffs.

i) (5%) Determine the optimal consumption (C_1) when the government imposes tariffs.

j) (5%) Determine the optimal current account balance (CA_1) when the government imposes tariffs.

k) (5%) What is the impact on optimal consumption (C_1) when the import tariff rate (τ_1) increases?

l) (5%) Can an increase in the import tariff rate (τ_1) improve the current account balance?