

Problem Set 1 (due on March 28, 2023)

Problem 1 (Balance of Payments, 20%) Before the 2008 global economic crisis, one of the most serious economic problems in the American economy was that of the twin deficits, an expression used to represent a situation in which the country simultaneously had a current-account deficit and fiscal deficit.

1. Based on the national account identities, show how these deficits are related.
2. As mentioned in class, it may be misleading to address the current account deficit using the national account identities. However, under what condition can we use the identities to discuss the determinants of current account deficit?

Problem 2 (A Review of Microeconomics, 30%) Consider the following optimization problem:

$$\max_{x,y} u(x) + \theta u(y)$$

s.t.

$$p_x x + p_y y = p_x \bar{x} + p_y \bar{y},$$

where \bar{x} and \bar{y} are endowments, and $\theta \in (0, 1)$ is a constant.

1. Derive the first order condition via the method of Lagrange multipliers.
2. Derive the first order condition via an unconstrained optimization problem.
3. Derive the first order condition via intuition.
4. Now suppose that $u(x) = \log x$, and $u(y) = \log y$, where \log denotes natural logarithm. Solve for the optimal choices x^* and y^* .
5. Determine if

$$\frac{\partial x^*}{\partial p_x} \geq 0?$$

In this case, does the substitution effect or income effect dominate?

6. Determine if

$$\frac{\partial x^*}{\partial p_y} \geq 0?$$

In this case, does the substitution effect or income effect dominate?

Problem 3 (A Simple Two-Period Model with Habit Formation, 20%) Consider a two-period model of consumption and savings where consumers have “habits”, meaning that they care about consumption relative to their own past consumption. Thus preferences are given by:

$$u(c_t) + \beta u(c_{t+1} - c_t),$$

where c_t denotes the consumption at time t . Suppose the consumers face a constant real interest rate r , and so face the constraints:

$$c_t + b_t = y_t,$$

$$c_{t+1} = y_{t+1} + (1 + r)b_t,$$

where y_t and y_{t+1} are exogenous endowments at time t and $t + 1$, respectively. The term b_t denotes bond holding.

1. Find the Euler equation linking c_t and c_{t+1} .
2. Provide an interpretation of the Euler equation.

Problem 4 (Problems from Chen (2021) Textbook. X.Y denotes 第 X 章, 習題 Y)

- 1.2 (15%)
- 1.3 (15%)