

International Trade Economics  
**Problem Set #3**  
**The due date: November 19h in class**

For submitting this homework, please make a photocopy of your homework and keep the photocopy and submit the original to me.

1. Consider a country that is called home. In this home country, there are two industries, clothing industry and food industry. In the clothing industry, it needs one unit of labor to produce one unit of clothing. In the food industry, it also need to take one unit of labor to produce one unit of food. In home country, there are 100 consumers who are also workers. This implies that there are 100 units of labor in the home country. The utility function of consumers in this home country is  $U(x_c, x_f) = \log x_c + \log x_f$ .
  - (a) Suppose that we measure  $x_c$  on the horizontal axis and  $x_f$  on the vertical axis. Then, we can calculate the slope of the indifference curve, which is called MRS. In this case, as I demonstrated in class, it is equal to  $x_f/x_c$ . Then, draw the relative demand curve of home by measuring  $p_c/p_f$  on the vertical axis and measuring  $x_c/x_f$  on the horizontal axis.
  - (b) Assume that this home country is a closed economy. Then, draw the relative supply curve and the relative demand curve.
  - (c) Find the equilibrium relative price in this home country when this home country is a closed economy.
  - (d) Calculate the amount of food and clothing produced in this home country when home country is a closed economy.
  - (e) Now consider a foreign country. In the foreign country, there are also clothing industry and food industry. In clothing industry, it needs 10 units of labor to produce one unit of clothing. In food industry, it needs 2 units to produce one unit of food. In this foreign country, there are 400 consumers and they are also workers too. So, there are 400 units of labor in the foreign country. The utility function of the consumers in the foreign country is the same as the utility function in the home country. Suppose that the foreign country is a closed economy. Now calculate the relative equilibrium price of clothing to food,  $p_c/p_f$  in the foreign country.
  - (f) Explain to which goods the home country has comparative advantage.
  - (g) When two countries are engaged in international trade, what is the equilibrium relative price between clothing and food,  $p_c/p_f$ ? Calculate  $p_c/p_f$  by using the relative supply curve and the relative demand curve. (Hint: first draw the vertical part of the worldwide relative supply curve. Let  $z$  be the worldwide relative supply at the vertical part of the worldwide relative supply curve. Then plug this  $z$  into the relative demand curve and find the relative price that generates this relative demand  $z$ . If this hypothetical relative price is between  $a_c/a_f$  and  $a_c^*/a_f^*$ , then the world equilibrium is achieved through the intersection of the vertical part of the worldwide relative supply curve and the demand curve. If it is not, then it must be other cases. )

- (h) Once you calculate the equilibrium relative price,  $p_c/p_f$ , then draw the budget line of the home country and the indifference curve of the home country. Notice that the tangent point of an indifference curve to the budget line is the optimal consumption of the home country. Calculate how much food and clothing the home country consume. Also show that both countries become strictly better off after international trade.
  - (i) Calculate how much the home imports and exports by calculating the difference between the production and consumption.
  - (j) Show that in the home, the total value of export is equal to the total value of import.
  - (k) Draw the budget line of the foreign country given the equilibrium relative price and calculate the consumption of food and clothing of foreign country.
  - (l) Calculate how much the home import and export by taking the difference between the consumption and production for each good.
  - (m) Show that the amount of export of the home country is the same as the amount of import of foreign country. Also show that the amount of import of the home country is the same as the amount of export of the foreign country.
2. (a) Give two examples in our real life ( except the examples that I did in the class ) that the explanation based on the theory of comparative advantage fit very well. Explain why it is so.