

Problem set # 2 – 2024

1.

(*specific factors model*) An economy can produce food and cloth. The production of food uses labor (L) and land (T) and the production of cloth uses labor and capital (K). The total supply of labor is 10 units. Given the supply of K and T the outputs of food and cloth depend on labor inputs as follow:

Labor input	Food Output	Cloth Output
0	0	0
2	3.8	5.2
6	7.3	8.1
8	8.7	9.1
10	10	10

- a. In the four-quadrants representation draw the production functions for food and cloth.
- b. Draw the PPF curve.
- c. Calculate approximately using the graph the level of productions and the labor inputs for the price of cloth in terms of food equal to 1 ($PC/PF = 1$);
- d. Show how the production change if the PC/PF is greater than 1 because of the opening up of Trade.
- e. Show how the effect of a rise of PC/PF affects wages in terms of cloth and in terms of food, the income of the capital owners and the income of the landowners.

2.

(*Heckscher-Ohlin model*) Mexico is labor abundant, and US is capital abundant. They produce textile and cars. The textile industry is more labor intensive than the car industry. Assume standard preferences.

- i. Draw the PPF of Mexico and the U.S.
- ii. In a pre-trade condition, is the PC/PF higher in Mexico or the US?
- iii. After the opening of trade, what happens to the price of capital (r) and labor (w), respectively, in Mexico and the US?
- iv. After the opening of the trade, describe how production changes in each industrial sector in Mexico and the US respectively and which goods are exported to Mexico and which to the United States?
- v. Who are the winners and the losers (capital owners/workers), respectively, in the US and in Mexico?
- vi. Discuss what are the prediction in terms of patterns of trade of the H-O model, if the model's prediction conforms with the empirical findings and in which cases it works better.

3.

(*standard model*) Consider an economy that produces two goods, cloth and food, and uses two factor, capital and labor. Starting from a production possibility frontier (PPF) show graphically how changing the terms of trade (PC/PF) you can construct the relative supply and the relative

demand curves (hint: for the relative demand uses the indifference curve to find the consumption points).

- a. Show how a technological improvement in the food sector affects the PPF.
- b. Show how an increase in the supply of labor due to immigration affects the PPF.
- c. Show how a growth biased toward the good the country exports affects the terms of trade (Hint: use the relative supply and demand curves)
- d. Show the effect of an introduction in the Home country of a tariff affects the terms of trade and the welfare effects. Discuss the case of a small country and a large country. (Hint: use the relative supply and demand curves)
- e. Show how an introduction in the Home country of an export subsidy affects the terms of trade. Discuss the case of a small country and a large country. (Hint: use the relative supply and demand curves)
- f. Immiserizing growth (India). Explain in words the concept of immiserizing growth. Show how the expansion of a country's export sector as result of a technological change can induce welfare losses. (Hint: uses the PPF and the indifference curves)

4.

(economies of scale) Evaluate the relative importance of economies of scale and comparative advantage in causing the following:

- a. Most of the world's aluminum is smelted in Norway or Canada.
- b. Half of the world's large jet aircraft are assembled in Seattle.
- c. Most semiconductors are manufactured in either the United States or Japan.
- d. Most Scotch whiskey comes from Scotland.
- e. Much of the world's best wine comes from France.

5.

(monopolistic competition) Suppose that fixed costs for a firm in the automobile industry (start-up costs of factories, capital equipment, and so on) are \$5 billion and that variable costs are equal to \$17,000 per finished automobile. Because more firms increase competition in the market, the market price falls as more firms enter an automobile market, or specifically, $P = 17,000 + (150/n)$, where n represents the number of firms in a market. Assume that the initial size of the U.S. and the European automobile markets are 300 million automobiles and 533 million automobiles, respectively.

- A. Calculate the equilibrium number of firms in the U.S. and European automobile markets *without* trade.
- B. What is the equilibrium price of automobiles in the United States and Europe if the automobile industry is closed to foreign trade?

Now suppose that the United States decides on free trade in automobiles with Europe. The trade agreement with the Europeans adds 533 million consumers to the automobile market, in addition to the 300 million in the United States. How many automobile firms will there be in the United States and Europe combined? What will be new equilibrium price of automobiles? Why are prices in the United States different in the case without trade and in the case with trade? Are consumers better off with free trade? In what ways?

6.

(partial equilibrium) The Government of a small country (a price taker in the international market) has decided to introduce a tariff on sugar imports of 50% (an increase of 50% of the price of sugar per kg.) The demand curve for sugar is given by $P = 28 - Q$ and the supply curve by $P = 0.6Q$. The international price of sugar per kg. is equal to 6.

1. Calculate the consumer surplus and the producer surplus and the quantity imported before the introduction of the tariff.
2. Calculate the effects on consumer and producer surplus as a result of the introduction of the tariff.
3. Calculate the government revenues.
4. Calculate the efficiency losses.
5. Make an overall assessment of the country's welfare because of the introduction of the tariff calculating the net cost of the tariff.