

Problem Set 4

Exercise 1

“The world’s poorest countries cannot find anything to export. There is no resource that is abundant – certainly not capital nor land, and in small poor nations not even labor is abundant.” Discuss.

Exercise 2

Consider a country, call it

Home, that produces crayons (C) and flash drives (F) using skilled labor (S) and unskilled labor (L). The techniques of production in each industry are Leontief, and hence unit factor requirements are fixed and given by:

$$\begin{aligned} a_{SC} &= 1; & a_{SF} &= 3, \\ a_{LC} &= 4; & a_{LF} &= 2. \end{aligned}$$

1. Which industry is skill intensive? How does the skilled-to-unskilled labor ratio in each industry depend on the relative wage w_S/w_L ?
2. Suppose that the world price of crayons is \$12 and the world price of flash drives is \$16. Assume that the Home country produces both goods. What are the free trade factor price levels w_S and w_L ?
3. What is the share of revenue going to skilled labor in each industry?
4. Suppose the world price of flash drives increases to \$26, while the price of crayons remains at \$12. What are the new values of w_S and w_L ? How have they changed? What theorem could you have used to predict this result?

5. What has happened to the share of revenue going to skilled labor in each industry as a result of the increase in the price of crayons?

Exercise 3

Consider the same economy as in Exercise 2 but now assume further that it has an aggregate endowment of 100 skilled workers and 150 unskilled workers.

1. How many crayons and flash drives will the economy produce?
2. How would your answer change if the economy's endowment of unskilled labor increased to 200? What theorem could you have used to predict this result?

Now assume that the Home economy admits a representative consumer with Cobb-Douglas preferences

$$U(D_C, D_F) = (D_C)^{1/2} (D_F)^{1/2}.$$

3. Solve for the relative demand of crayons and flash drives in terms of the relative price P_C/P_F .
4. Assume again that the endowments of skilled and unskilled labor are 100 and 150, respectively. What is the autarky equilibrium value of P_C/P_F ?
5. What is the relative wage w_S/w_L in equilibrium?

Now consider another economy, call it Foreign, with identical preferences and technologies, but with endowments of skilled and unskilled labor of 100 and 200, respectively.

6. What is the equilibrium relative price in Foreign? And the equilibrium relative wage w_S/w_L in Foreign?

Exercise 4

Finally, suppose the two countries described above, Home and Foreign, are the only two countries in the world. Suppose they are allowed to trade with each other at zero trade costs. [Note: don't be discouraged by noninteger solutions]

1. Compute the world relative supply of crayons and flash drives.
2. What is the equilibrium relative price in the world economy?

3. Compute the relative wage w_S/w_L in each country. How do these compare to the autarky ones?
4. Compute the relative aggregate income in the two countries. Use this answer to compute the consumption of crayons and flash drives in each country.
5. Which good will each country export in equilibrium? What theorem could you have used to predict this result? **Extra credit:** compute the amount of crayons and flash drives transacted across borders.