EC1B5 | Chapter 14

Macroeconomics and International Trade

Additional Practice Questions:

Book Question 3

In India, an acre of land can produce 40 tons of sugar cane or 65 bushels of corn per season, while in the United States, an acre of land can produce 20 tons of sugarcane or 150 bushels of corn per season.

a. Which country has the absolute advantage in the production of sugar cane? Of corn? Explain.

b. Explain the concept of comparative advantage. What is India's comparative advantage in this case? What about the United States?

c. Suppose U.S. scientists have developed a groundbreaking new technology that increases the productivity of sugarcane in the United States to 75 tons of sugarcane per acre (and has no effect on U.S. corn productivity or Indian productivity in sugarcane or corn). How does this change India's comparative advantage?

Answer:

a. Because the United States has higher productivity (output per acre of land) in corn (i.e., American land can produce more corn per acre in a season than Indian land), the United States has an absolute advantage in corn. India, however, has absolute advantage in producing sugar: it has higher productivity in sugar than the United States.

b. A country has a comparative advantage in a good if it has a lower opportunity cost of producing that good. Thus, a country has a comparative advantage in producing good X if its relative productivity (relative to good Y) is higher in the production of good X.

	Opportunity Cost of Corn	Opportunity Cost of Sugar
United States	2/15 ton	15/2 bushels
India	8/13 ton	13/8 bushels

The United States has the comparative advantage in corn. India has the comparative advantage in sugar.

c. It doesn't change—India still has comparative advantage in sugar. Although the opportunity cost of sugar has decreased to 2 for the United States, the opportunity cost of sugar in India is still lower ($13/8 < 2$). Thus, the comparative advantage of India is still in sugar.

Book Question 4

Assume that an American worker can produce 5 cars per year or 10 tons of grain per year, whereas a Japanese worker can produce 15 cars per year or 5 tons of grain per year. Assume for this exercise that labor is the only input used in car and grain production.

a. Which country has the absolute advantage in producing cars? In producing grain?

b. For the United States, what is the opportunity cost of producing a car? What is the opportunity cost of producing a ton of grain? Show how you arrived at your numbers.

c. For Japan, what is the opportunity cost of producing a car? What is the opportunity cost of producing a ton of grain? Show how you arrived at your numbers.

d. If free trade is allowed, which country will import cars? Which country will import grain? Explain.

Answer:

a. The following table summarizes the numbers given in the problem.

	Cars	Grain (tons)
United States	5	10
Japan	15	5

Because Japanese workers can produce 15 cars in a year versus only 5 for a U.S. worker, Japan has an absolute advantage in auto production. An American worker can produce 10 tons of grain, while a Japanese worker can produce only 5. So the United States has an absolute advantage in producing grain.

(For b. and c., students should have made calculations of the opportunity cost for each country and each good, which result in the numbers in the following table.)

	Opportunity Cost of Cars	Opportunity Cost of Grain
U.S.	2 tons of grain	1/2 car
Japan	1/3 ton of grain	3 cars

b. Based on the productivity numbers given in the problem, the opportunity cost of a car in the United States is found by simply calculating the number of tons of grain that *could have been produced* in the United States with the labor used to produce one car. Likewise, the opportunity cost of a ton of grain in the United States is found by calculating the number of cars that *could have been produced* in the United States with the labor used to produce one ton of grain.

These calculations result in the numbers for the United States shown in the previous table. The opportunity cost of a car in the United States is 2 tons of grain, and the opportunity cost of a ton of grain is 1/2 car.

c. Based on the productivity numbers given in the problem, the opportunity cost of a car in Japan is found by simply calculating the number of tons of grain that *could have been produced* in Japan with the labor used to produce one car. Likewise, the opportunity cost of a ton of grain in Japan is found by calculating the number of cars that *could have been produced* in Japan with the labor used to produce one ton of grain.

These calculations result in the numbers for Japan shown in the previous table. The opportunity cost of a car in Japan is 1/3 ton of grain, and the opportunity cost of a ton of grain is 3 cars.

d. Under free trade, a country will specialize in the good in which it has a comparative advantage, defined as lower opportunity cost.

The United States has a lower opportunity cost of grain production (1/2 car versus 3 cars for Japan), so it will specialize in grain production and import cars.

Conversely, Japan has a lower opportunity cost of car production (1/3 ton of grain versus 2 tons in the United States), so it will specialize in car production and import grain.

Book Question 5

Use the information below to answer the questions that follow.

	Production per Unit of Labor	
	The United States	**Germany**
Wheat (tons)	120	200
Cars	200	400

a. Which country has the absolute advantage in producing cars? In producing wheat?

b. For the United States, what is the opportunity cost of producing a car? What is the opportunity cost of producing a ton of wheat?

c. For Germany, what is the opportunity cost of producing a car? What is the opportunity cost of producing a ton of wheat?

d. If free trade is allowed, which country will export cars? Which country will export wheat? Explain.

Answer:

a. Every German worker can produce more goods individually than its American counterpart can. This means that Germans enjoy an absolute advantage in the production of cars and wheat.
b. For the United States, the opportunity cost of producing a car is 120/200 = 0.6, and the opportunity cost of producing a ton of wheat is 200/120 = 1.67.
c. For Germany, the opportunity cost of producing a car is 200/400 = 0.5, and the opportunity cost of producing a ton of wheat is 400/200 = 2.
d. Under free trade, a country will specialize in producing the good in which it has a comparative advantage, defined as lower opportunity cost.

Germany has a lower opportunity cost of producing cars, and the United States has a lower opportunity cost of producing wheat. Therefore, Germany will export cars, and the US will export wheat.

Book Question 9

In 2019, the U.S. current account deficit was $480 billion, while the trade deficit was $577 billion.

a. Why are the trade deficit and the current account deficit different?

b. Based on the information in this problem, what were U.S. net capital outflows in the second quarter of 2020? Carefully show how you got your answer and explain, in words, the concept of net capital outflows.

c. Suppose Apple (based in the United States) sold an additional $0.5 billion in iPhones to retailers in Spain. How would this transaction affect the trade deficit? What about net capital outflows? Explain.

d. How would an increase in the U.S. real interest rate affect the trade deficit? Net capital outflows? Explain.

Answer:

a. You will remember from the chapter that the current account is composed of the trade balance (net exports) as well as factor payments and international transfers. Thus, trade is only one component of the current account. It is possible, for example, to have a trade deficit but a current account surplus, if surpluses in factor payments and international transfers outweigh the trade deficit.

b. Based on this problem, U.S. net capital outflows were -$577 billion dollars (that is, more capital was flowing in than out). As we saw in this chapter, we can re-arrange the National Income Identity ($Y = C + I + G + X – M$), so that we get (Y – C – G) – $I = X – M$, or, if we substitute in savings, $S – I = X – M$. $X – M$, here, is net exports; we defined $S – I$ as net capital outflows. Net capital outflows tell us how much money, on net, is flowing out of the country—this money could be in the form of investments, for example. The intuition behind the equality between NCOs and net exports is that the money obtained during a trade exchange constitutes, on its own, an investment in the foreign country. This investment could simply be an IOU, as we saw in the chapter; it could also, more tangibly, be a range of foreign assets. Either way, the exporting country is now investing in its trade partner.

c. An additional .5 billion in exports to Spain, all else equal, would reduce the deficit by .5 billion—using the number given in the problem, it would now be at 576.5 billion dollars. The money used by Spain to purchase the iPhones would represent an increase in U.S. net capital outflows (e.g. Spain might issue an IOU to the United States); now, the NCOs would be -576.5 billion dollars for the United States.

d. An increase in the U.S. real interest rate would attract more foreign investors, decreasing Net Capital Outflows. Because of the relationship we derived in part b., net exports would also decrease (deepening any existing trade deficit).