



Chapter 20 Exercises

Self-Check Questions

1. True or false: the source of comparative advantage must be natural elements, like climate and mineral deposits. Explain.
2. Brazil can produce 100 pounds of beef or 10 cars; in contrast, the United States can produce 40 pounds of beef or 30 cars. Which country has the absolute advantage in beef? Which country has the absolute advantage in cars? What is the opportunity cost of producing 1 pound of beef in Brazil? What is the opportunity cost of producing 1 pound of beef in the United States?
3. In France, it takes 1 worker to produce 1 sweater and 1 worker to produce 1 bottle of wine. In Tunisia, it takes 2 workers to produce 1 sweater and 3 workers to produce 1 bottle of wine. Who has the absolute advantage in production of sweaters? Who has the absolute advantage in production of wine? How can you tell?
4. In Germany, it takes 3 workers to make 1 television and 4 workers to make 1 video camera. In Poland, it takes 6 workers to make 1 television and 12 workers to make 1 video camera.
 - a. Who has the absolute advantage in the production of televisions? Who has the absolute advantage in the production of video cameras? How can you tell?
 - b. Calculate the opportunity cost of producing one additional television set in Germany and in Poland. (Your calculation may involve fractions, which is fine.) Which country has a comparative advantage in the production of televisions?
 - c. Calculate the opportunity cost of producing 1 video camera in Germany and in Poland. Which country has a comparative advantage in the production of video cameras?
 - d. In this example, is absolute advantage the same as comparative advantage, or not?
 - e. In what product should Germany specialize? In what product should Poland specialize?
5. How can there be any economic gains for a country from both importing and exporting the same good, like cars?

6. The following table shows how the average costs of production for semiconductors (the chips in computer memories) change as the quantity of semiconductors built at that factory increases.

Quantity of Semiconductors	Average Total Cost
10,000	\$8 each
20,000	\$5 each
30,000	\$3 each
40,000	\$2 each
100,000	\$2 each

- a. Based on these data, sketch a curve with quantity produced on the horizontal axis and average cost of production on the vertical axis. How does the curve illustrate economies of scale?
 - b. If the equilibrium quantity of semiconductors demanded is 90,000, can this economy take full advantage of economies of scale? What about if quantity demanded is 70,000 semiconductors, 50,000 semiconductors, or 30,000 semiconductors?
 - c. Explain how international trade could make it possible for even a small economy to take full advantage of economies of scale while also benefiting from competition and the variety offered by several producers.
7. If the removal of trade barriers is so beneficial to international economic growth, why would a nation continue to restrict trade on some imported or exported products?

Review Questions

8. What is absolute advantage? What is comparative advantage?
9. Under what conditions does comparative advantage lead to gains from trade?
10. What factors did Paul Krugman identify that supported the expansion of international trade in the 1800s?
11. Is it possible to have a comparative advantage in the production of a good but not to have an absolute advantage? Explain.
12. How does comparative advantage lead to gains from trade?
13. What is intra-industry trade?
14. What are the two main sources of economic gains from intra-industry trade?
15. What is splitting up the value chain?
16. Are the gains from international trade more likely to be relatively more important to large or small countries?

Critical Thinking Questions

17. Are differences in geography behind the differences in absolute advantages?
18. Why does the United States not have an absolute advantage in coffee?
19. Return to Exercise 2. Compute the opportunity costs of producing sweaters and wine in both France and Tunisia. Who has the lowest opportunity cost of producing sweaters, and who has the lowest opportunity cost of producing wine? Explain what it means to have a lower opportunity cost.
20. Suppose you just overheard your friend say, "Poor countries like Malawi have no absolute advantages. They have poor soil, low investments in formal education and hence low-skill workers, no capital, and no natural resources to speak of. Because they have no advantage, they cannot benefit from trade." How would you respond?
21. Consider the following table. Is there a range of trades for which there will be no gains?

Country	Current Shoe Production	Current Refrigerator Production
United States	5,000	20,000
Mexico	4,000	5,000
Total	9,000	25,000

22. You just got a job in Washington, D.C. You move into an apartment with some acquaintances. None of your roommates clean up after themselves. You, on the other hand, can clean faster than each of them. You determine that you are 70% faster at dishes and 10% faster at vacuuming. Both tasks have to be done daily. Which jobs should you assign to your roommates to get the most free time overall? Assume you have the same number of hours to devote to cleaning. Now, since you are faster, you seem to get done quicker than your roommate. What sorts of problems may this create? Can you imagine a trade-related analogy for this problem?
23. Does intra-industry trade contradict the theory of comparative advantage?
24. Do consumers benefit from intra-industry trade?
25. Why might intra-industry trade seem surprising from the point of view of comparative advantage?
26. In World Trade Organization meetings, what do you think low-income countries lobby for?
27. Why might a low-income country put up barriers to trade, such as tariffs on imports?
28. Can a nation's comparative advantage change over time? What factors would make it change?

Problems

29. France and Tunisia both have Mediterranean climates that are excellent for producing and harvesting green beans and tomatoes. In France, it takes 2 hours for each worker to harvest green beans and 2 hours to harvest a tomato. Tunisian workers only need 1 hour to harvest the tomatoes but 4 hours to harvest green beans. Assume there are only 2 workers, and each worker works 40 hours a week.
- Draw a production possibilities frontier for each country. (*Hint:* remember, the production possibility frontier is the maximum that all workers can produce in a unit of time which, in this problem, is a week.)
 - Identify which country has the absolute advantage in green beans and which has the absolute advantage in tomatoes.
 - Identify which country has the comparative advantage.
 - How much would France have to give up in terms of tomatoes to gain from trade? How much would it have to give up in terms of green beans?
30. In Japan, 1 worker can make 5 tons of rubber or 80 radios. In Malaysia, 1 worker can make 10 tons of rubber or 40 radios.
- Who has the absolute advantage in the production of rubber or radios? How can you tell?
 - Calculate the opportunity cost of producing 80 additional radios in Japan and in Malaysia. Which country has a comparative advantage in the production of radios?
 - Calculate the opportunity cost of producing 10 additional tons of rubber in Japan and in Malaysia. Which country has a comparative advantage in producing rubber?
 - In this example, does each country have an absolute advantage and a comparative advantage in the same good, or not?
 - In what product should Japan specialize? In what product should Malaysia specialize?

31. The following table describes how many barrels of oil and tons of lumber can be produced by workers in Canada and Venezuela.

Country	Oil (barrels)	Lumber (tons)
Canada	20	40
Venezuela	60	30

- a. Draw a production possibilities frontier for each country. Assume there are 100 workers in each country. Canadians and Venezuelans desire both oil and lumber. Canadians want at least 2,000 tons of lumber. Mark a point on their production possibilities where they can get at least 3,000 tons.
- b. Assume that the Canadians specialize completely because they figured out they have a comparative advantage in lumber. They are willing to give up 1,000 tons of lumber. How much oil should they ask for in return for lumber to be as well off as they were with no trade? How much should they ask for if they want to gain from trading with Venezuela? (*Note: we can think of this ask as the relative price or trade price of lumber.*)
- c. Is the Canadian ask you identified in (b) also beneficial for Venezuelans? Use the production possibilities frontier graph for Venezuela to show that Venezuelans can gain from trade.
- d. Is there an ask where Venezuelans may say “no, thank you” to trading with Canada?
32. From earlier chapters you will recall that technological change shifts the average cost curves. Draw a graph showing how technological change could influence intra-industry trade.
33. Consider two countries: South Korea and Taiwan. Taiwan can produce 1 million mobile phones per day at a cost of \$10 per phone, and South Korea can produce 50 million mobile phones per day at a cost of \$5 per phone. Assume these phones are the same type and quality and there is only one price. What is the minimum price at which both countries will engage in trade?
34. If trade increases world GDP by 1% per year, what is the global impact of this increase over ten years? How does this increase compare to the annual GDP of a country like Sri Lanka? (*Hint: to answer this question, here are steps you may want to consider. Go to the World Development Indicators [online] published by the World Bank. Find the current level of world GDP in constant international dollars. Also, find the GDP of Sri Lanka in constant international dollars. Once you have these two numbers, compute the increase in global GDP due to trade and compare that number to Sri Lanka’s GDP.*)