

KEY TERMS

abundant factor, p. 96	factor content of trade, p. 104	Leontief paradox, p. 104
biased expansion of production possibilities, p. 93	factor intensity, p. 84	scarce factor, p. 96
equalization of factor prices, p. 102	factor prices, p. 89	skill-biased technological change, p. 98
factor abundance, p. 84	factor-proportions theory, p. 84	
	Heckscher-Ohlin theory, p. 84	

PROBLEMS

MyEconLab

1. Go back to the numerical example with no factor substitution that leads to the production possibility frontier in Figure 5-1.
 - a. What is the range for the relative price of cloth such that the economy produces both cloth and food? Which good is produced if the relative price is outside of this range?
For parts (b) through (f), assume the price range is such that both goods are produced.
 - b. Write down the unit cost of producing one yard of cloth and one calorie of food as a function of the price of one machine-hour, r , and one work-hour, w . In a competitive market, those costs will be equal to the prices of cloth and food. Solve for the factor prices r and w .
 - c. What happens to those factor prices when the price of cloth rises? Who gains and who loses from this change in the price of cloth? Why? Do those changes conform to the changes described for the case with factor substitution?
 - d. Now assume the economy's supply of machine-hours increases from 3,000 to 4,000. Derive the new production possibility frontier.
 - e. How much cloth and food will the economy produce after this increase in its capital supply?
 - f. Describe how the allocation of machine-hours and work-hours between the cloth and food sectors changes. Do those changes conform with the changes described for the case with factor substitution?
2. In the United States, where land is cheap, the ratio of land to labor used in cattle raising is higher than that of land used in wheat growing. But in more crowded countries, where land is expensive and labor is cheap, it is common to raise cows by using less land and more labor than Americans use to grow wheat. Can we still say that raising cattle is land-intensive compared with farming wheat? Why or why not?
3. "The world's poorest countries cannot find anything to export. There is no resource that is abundant—certainly not capital or land, and in small poor nations not even labor is abundant." Discuss.
- 4. The U.S. labor movement—which mostly represents blue-collar workers rather than professionals and highly educated workers—has traditionally favored limits on imports from less-affluent countries. Is this a shortsighted policy or a rational one in view of the interests of union members? How does the answer depend on the model of trade?
5. Recently, computer programmers in developing countries such as India have begun doing work formerly done in the United States. This shift has undoubtedly led to substantial pay cuts for some programmers in the United States. Answer the following two questions: How is this possible, when the wages of skilled labor

- are rising in the United States as a whole? What argument would trade economists make against seeing these wage cuts as a reason to block outsourcing of computer programming?
6. Explain why the Leontief paradox and the more recent Bowen, Leamer, and Sveikauskas results reported in the text contradict the factor-proportions theory.
 7. In the discussion of empirical results on the Heckscher-Ohlin model, we noted that recent work suggests that the efficiency of factors of production seems to differ internationally. Explain how this would affect the concept of factor-price equalization.

FURTHER READINGS

- Donald R. Davis and David E. Weinstein. "An Account of Global Factor Trade." *American Economic Review* 91 (December 2001), pp. 1423–1453. This paper confirms the results from earlier studies that the empirical performance of a "pure" Heckscher-Ohlin model is very poor. It then shows how the empirical success of a modified version of the model is vastly improved.
- Alan Deardorff. "Testing Trade Theories and Predicting Trade Flows," in Ronald W. Jones and Peter B. Kenen, eds. *Handbook of International Economics*. Vol. 1. Amsterdam: North-Holland, 1984. A survey of empirical evidence on trade theories, especially the factor-proportions theory.
- Lawrence Edwards and Robert Z. Lawrence, *Rising Tide: Is Growth in Emerging Economies Good for the United States?* (Peterson Institute for International Economics, 2013). A new book discussing the impact for the United States of increased integration with rapidly growing countries in the develop world.
- Gordon Hanson and Ann Harrison. "Trade and Wage Inequality in Mexico." *Industrial and Labor Relations Review* 52 (1999), pp. 271–288. A careful study of the effects of trade on income inequality in our nearest neighbor, showing that factor prices have moved in the opposite direction from what one might have expected from a simple factor-proportions model. The authors also put forward hypotheses about why this may have happened.
- Ronald W. Jones. "Factor Proportions and the Heckscher-Ohlin Theorem." *Review of Economic Studies* 24 (1956), pp. 1–10. Extends Samuelson's 1948–1949 analysis (cited on the next page), which focuses primarily on the relationship between trade and income distribution, into an overall model of international trade.
- Ronald W. Jones. "The Structure of Simple General Equilibrium Models." *Journal of Political Economy* 73 (December 1965), pp. 557–572. A restatement of the Heckscher-Ohlin-Samuelson model in terms of elegant algebra.
- Ronald W. Jones and J. Peter Neary. "The Positive Theory of International Trade," in Ronald W. Jones and Peter B. Kenen, eds. *Handbook of International Economics*. Vol. 1. Amsterdam: North-Holland, 1984. An up-to-date survey of many trade theories, including the factor-proportions theory.
- Bertil Ohlin. *Interregional and International Trade*. Cambridge: Harvard University Press, 1933. The original Ohlin book presenting the factor-proportions view of trade remains interesting—its complex and rich view of trade contrasts with the more rigorous and simplified mathematical models that followed.
- John Van Reenen. "Wage Inequality, Trade, and Growth." *American Economic Review* 91 (December 2001), pp. 1454–1463. This paper shows that the empirical success of a modified version of the Heckscher-Ohlin model is vastly improved.