

## Chapter 2

### The Ricardian Theory of Comparative Advantage

#### True/False Questions

1. The Ricardian model of trade concludes that there will be winners and losers from trade.  
**False; Easy**
2. A difference in the demand for goods between two countries is sufficient to initiate trade between them.  
**True; Easy**
3. If the United States can produce cars at a lower labor cost than Mexico, then the U.S. has a comparative advantage in the production of cars over Mexico.  
**False; Moderate**
4. If a country has comparative advantage in the production of a good, it must also have absolute advantage in that good.  
**False; Moderate**
5. In a two-commodity world, if a country has technological advantage in the production of both goods, then there can be no gains from trade for this country.  
**False; Easy**
6. A country should specialize in the production of that good which has the highest opportunity cost of production.  
**False; Easy**
7. In a two-country, two-good Ricardian model, a country can have comparative advantage in both goods.  
**False; Easy**
8. An important assumption made in the Ricardian model of trade is that labor is homogeneous across firms and countries.  
**False; Easy**
9. In autarky, a good is priced higher in the country which has a comparative advantage in producing that good.  
**False; Easy**
10. If Laura can cook more meals and paint more pictures than Michelle can in five hours, then more can be produced if Laura does all the work herself.  
**False; Easy**
11. Perfectly competitive firms in the Ricardian model maximize profit by equating price with opportunity cost of production.  
**False; Easy**
12. If a utility function is homothetic, it implies that goods are consumed in fixed proportions irrespective of income.  
**True; Easy**

13. The quantity of a good produced by an industry is determined by the product of the number of workers employed by that industry and its unit labor requirement.  
**False; Moderate**
14. If the sum of labor applied in all industries of a country is equal to the labor endowment then labor is over-utilized.  
**False; Easy**
15. A variable is endogenous to a model if it is determined by processes that are not described within the model itself.  
**False; Easy**
16. All production possibilities, regardless of whether full employment is fulfilled, are referred to as the production possibility set.  
**True; Easy**
17. Suppose labor productivity in the production of a car in England is 1/5 car per thousand hours, while it is 1/10 car per thousand hours in Denmark. This implies Denmark has an absolute advantage in the production of cars.  
**False; Moderate**
18. In a Ricardian model where a country produces bags and shoes, the marginal cost of producing an extra bag is equivalent to the decline in shoe production.  
**False; Easy**
19. The Ricardian model is called the constant cost model because the opportunity cost is fixed for all levels of production.  
**True; Easy**
20. Consider a country in the Ricardian model which produces books and pens. If books and pens are measured on the horizontal and vertical axes respectively, then the slope of the country's production possibility frontier will express the number of pens that must be given up to produce an extra book.  
**True; Easy**
21. If full employment is assumed, it can be concluded that the economy is operating on the production possibility frontier.  
**True; Easy**
22. In the Ricardian model of two countries and two goods, specialization according to comparative advantage increases world productive efficiency.  
**True; Easy**
23. The terms of trade for a country which imports 7 tons of steel and exports 14 cars is 2 cars per ton of steel.  
**True; Easy**
24. When economic profit is assumed to be zero, the wage of the workers in any industry is obtained by the product of revenue generated and the number of workers employed by that sector.

**False; Easy**

25. In a Ricardian model where a barter system prevails, the price of a good in autarky, in terms of the other good, is equal to its opportunity cost.

**True; Easy**

26. The “invisible hand” describes the process in which firms and individuals, motivated by profit, automatically choose the appropriate good to produce and trade.

**True; Easy**

27. Assume a Ricardian model in which a country has comparative advantage in the production of perfumes, while its trading partner has comparative advantage in the production of wine. This implies that post trade, the price ratio of perfumes to wine will fall in the country specializing in perfumes.

**False; Moderate**

28. Suppose a country in the Ricardian model produces two goods A and B. The price ratio,  $P_A/P_B$ , rises after trade. This implies the country has comparative advantage in good A and exports the same.

**True; Moderate**

29. A country in the Ricardian model produces shoes and socks. Post trade, it imports socks and exports shoes. This implies that the price ratio of socks-to-shoes will increase after trade.

**False; Easy**

30. The gains from trade accruing to workers can be accurately estimated from the movement in nominal wages.

**False; Easy**

31. Real wage is obtained by dividing the nominal wage by the price ratio of the two goods produced by a country in the Ricardian model.

**False; Easy**

32. If a country in autarky has labor productivity in chocolate production of 5 kg/hr, then the real wage of workers in this sector in terms of chocolates will also be 5 kg/hr.

**True; Easy**

33. A country in the Ricardian model produces two goods, cars and steel. Post trade, it exports cars and imports steel. The real wages of car workers in terms of steel is given by the product of the price ratio,  $P_C/P_S$ , and the unit labor requirement in the car industry.

**False; Moderate**

34. As long as the free trade price ratio is higher than the autarky price ratios of both trading countries, workers in both countries benefit from trade.

**False; Easy**

35. A country's autarky production and consumption points are determined where the aggregate indifference curve is tangent to its production possibility frontier.

**True; Easy**

36. In the Ricardian model, both countries achieve higher indifference curves after trade, which reflects a higher aggregate utility than their respective autarky levels.  
**True; Easy**

### Multiple Choice Questions

1. Which of the following is the cause of trade in the Ricardian model?
- Differences in technology
  - Differences in resource endowments
  - Differences in demand
  - Existence of economies of scale in production
  - Existence of government policies that distort prices
- a; Easy**
2. \_\_\_\_\_ refers to a production process in which production costs fall as the scale of production rises.
- Decreasing returns to scale
  - Increasing returns to scope
  - Increasing returns to scale
  - Constant returns to scale
  - Decreasing returns to scope
- c; Easy**
3. The Ricardian trade theory asserts that:
- there will be winners and losers in trade.
  - everyone benefits from trade.
  - countries with a higher demand benefit more from trade.
  - the lower the distortions to price due to taxes, the higher the gains from trade.
  - the better the technology, the higher the gains from trade.
- b; Easy**
4. What was the difference between Adam Smith's example of trade and Ricardo's example?
- Adam Smith assumed two resources, capital and labor, while Ricardo assumed labor to be the only resource.
  - In Adam Smith's example, there was a difference in the labor endowments of the two countries, while Ricardo assumed an equal labor force.
  - In Adam Smith's example, one country had absolute advantage in both goods, while in Ricardo's example one country had comparative advantage in both goods.
  - Adam Smith assumed each country had a comparative advantage in the production of one good, while Ricardo assumed each country had absolute advantage in one good.
  - Adam Smith assumed each country had an absolute advantage in the production of one good, while Ricardo assumed one country had absolute advantage in both goods.
- e; Easy**
5. A country has comparative advantage in the production of a good if:
- its resource cost of producing that good is lowest among other countries.
  - it has a higher endowment of the resources necessary to produce that good.
  - the opportunity cost of producing that good is lowest in comparison to other countries.
  - it has a higher domestic demand for that good.
  - the market price of the good is higher than other goods.

**c; Easy**

6. The amount of good A that must be given up for the production of another good B is:
- the marginal cost of producing B.
  - the opportunity cost of producing B.
  - the marginal cost of producing A.
  - the opportunity cost of producing A.
  - the explicit cost of producing B.

**b; Easy**

7. Two countries, Munisia and Swanland, produce two goods, garments and cars. If Munisia has comparative advantage in the production of garments, it implies that:
- Munisia has to give up fewer units of cars for the production of an additional garment.
  - Swanland has to give up fewer units of cars for the production of an additional garment.
  - Munisia's cost of producing garments is lower than Swanland's.
  - Swanland's cost of producing garments is lower than Munisia's.
  - Swanland has better technology for producing garments but Munisia has lower wages.

**a; Easy**

8. Nelly can make 6 pizzas or 4 cakes in 5 hours. Joe can make 2 pizzas or 3 cakes in the same time. Which of the following statements is true?
- Nelly has absolute advantage in both goods but comparative advantage in none.
  - Joe has comparative advantage in none of the goods.
  - Nelly has comparative advantage in making pizzas.
  - Joe has absolute advantage in making cakes.
  - Neither Joe nor Nelly has comparative advantage in any of the goods.

**c; Moderate**

9. Assume a Ricardian model of two countries and two goods. If one country has absolute advantage in the production of both goods, then:
- there can be no gains from trade between the two countries.
  - real wages in this country will be lower in both industries than the other country.
  - it should specialize in the good in which its productive advantage is higher.
  - it also has comparative advantage in both.
  - trade will benefit this country more than its partner.

**c; Easy**

10. Which of the following assumptions about labor is true of the Ricardian model of trade?
- Labor productivity is identical in industries and countries.
  - Labor is always fully employed.
  - Labor is heterogeneous within a country but homogeneous across countries.
  - Labor can be reallocated costlessly between countries but cannot move between industries.
  - Labor is the least important of all the inputs used in production.

**b; Easy**

11. Differences in technology between two countries in the Ricardian model lead to \_\_\_\_\_ which stimulate trade.
- differences in relative prices
  - differences in wages
  - differences in demand

- d. differences in marginal costs
- e. differences in government policies

**a; Easy**

12. In a two-country, two-commodity world, a country exports its comparative advantage good because:

- a. it is the least costly to produce.
- b. the price of its comparative advantage good is higher in the other country.
- c. demand for its comparative advantage good is higher in the other country.
- d. domestic demand for this good declines.
- e. economic profit in the same industry in the other country is higher.

**b; Easy**

13. In order to guarantee continued production of a good after trade, a country must have:

- a. low production cost.
- b. technological superiority.
- c. a comparative advantage.
- d. an absolute advantage.
- e. high prices.

**c; Easy**

14. When world production efficiency rises with trade it means:

- a. trade increases consumption possibilities for every individual.
- b. trade increases consumption possibilities for countries.
- c. trade enhances the choices and prices available in the market.
- d. trade creates competition among the firms of the two countries.
- e. trade increases production without an increase in inputs.

**e; Easy**

15. Which of the following is assumed in the Ricardian model of trade?

- a. Industries are subject to increasing returns to scale.
- b. Resource endowments differ across countries.
- c. Goods are heterogeneous across firms and countries.
- d. Consumers maximize their utility subject to an income constraint.
- e. Two types of goods are produced using two factors of production.

**d; Easy**

16. Perfect competition implies which of the following?

- a. All firms can affect market prices.
- b. Firms maximize profit by equating price with marginal cost of production.
- c. Goods produced by different firms in the same industry are slightly differentiated.
- d. Economic profit is positive in a perfectly competitive industry in equilibrium.
- e. Information is costly in a perfectly competitive industry.

**b; Easy**

17. Countries A and B operate in the Ricardian model. Which of the following statements will be true?

- a. Only a few firms operate in each industry.
- b. Firms choose to maximize sales.
- c. Production functions are homothetic such that all factors are used in a fixed proportion.
- d. Each country produces two goods.

e. Goods are traded for money.

**d; Easy**

18. If  $Q_i$  stands for quantity of good  $i$  produced;  $L_i$  = labor employed in the industry; and  $a_{Li}$  is the unit labor requirement in this industry, which of the following equalities is correct?

a.  $Q_i = a_{Li} / L_i$

b.  $Q_i \times L_i = a_{Li}$

c.  $Q_i = L_i / a_{Li}$

d.  $Q_i = L_i \times a_{Li}$

e.  $Q_i / a_{Li} = L_i$

**c; Easy**

19. Assume a Ricardian model where a country produces bread and jam. The unit labor requirement for bread production is 0.04 hours per loaf, while the available labor hours are 200. Calculate the number of loaves of bread produced per day.

a. 8

b. 80

c. 5,000

d. 500

e. 8,000

**c; Moderate**

20. Assume a Ricardian model where a country produces bread and jam. The unit labor requirement for bread production is 0.04 hours per loaf, while the available labor hours per day are 200. Calculate the labor productivity in the bread industry.

a. 8

b. 25

c. 2.5

d. 0.2

e. 0.8

**b; Moderate**

21. Assume a Ricardian model where a country produces bread and jam in autarky. The unit labor requirement for bread production is 0.04 hours per loaf, while the available labor hours per day are 200. If this country has an absolute advantage in bread production, which of the following conclusions can be drawn?

a. The unit labor requirement in the bread industry of its trading partner is higher than 0.04.

b. Labor productivity of the trading partner is 0.04.

c. The country produces 8,000 loaves of bread every day.

d. The country also has a comparative advantage in the production of bread.

e. Its trading partner has a smaller labor force.

**a; Moderate**

22. In a general equilibrium model with perfect competition in all industries, which of the following variables is exogenous?

a. The labor productivities for the goods produced

b. The production level in each industry

c. The labor supplied to the different industries

d. The wage rate in each industry

e. The free-trade price ratio

**a; Easy**

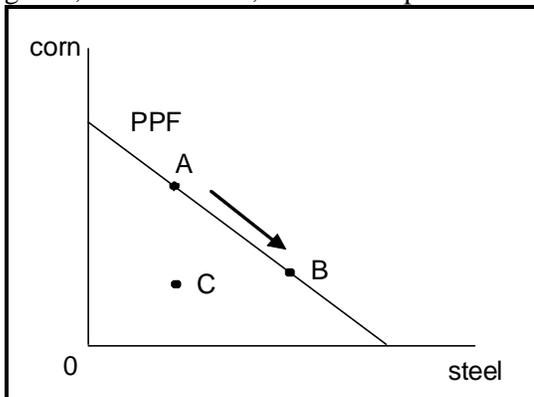
23. Assume a Ricardian model with a country producing bread and wine. The unit labor requirements for bread and wine production are 1 hour per loaf of bread and 5 hours per gallon of wine. The total available labor hours in the bread and wine industries are 100 and 150 hours respectively. If all wine workers are shifted to bread production, what will be the total production of bread?
- a. 100 loaves
  - b. 30 loaves
  - c. 50 loaves
  - d. 150 loaves
  - e. 250 loaves

**e; Moderate**

24. If the entire labor force of a country is used to produce only one good, which of the following will be true?
- a. The production point will lie inside the production possibility frontier.
  - b. The overall productivity will decline.
  - c. The production point will lie on the axis on which this good is measured.
  - d. The production point will lie at the point of tangency between the production possibility frontier and the indifference curve.
  - e. The production possibility frontier will be horizontal.

**c; Easy**

25. The following figure shows the production possibility frontier of a country that produces two goods, corn and steel, with the help of labor.



Refer to the figure and identify the correct statement from the following.

- a. A movement from A to B causes some resources to be unemployed.
- b. Points A, B, and C are all part of the production possibility set.
- c. Production at point C involves an efficient allocation of resources.
- d. Resources available are fully employed at all points within the production possibility set.
- e. A movement from point A to C is just as efficient as a movement from A to B.

**b; Easy**

26. Identify the correct statement from the following.
- a. The production possibility frontier shifts in response to a change in a country's resource endowments.
  - b. Any movement along the production possibility frontier leads to underutilization of resources.

- c. All points within the production possibility set reflect full employment of resources.
- d. All points outside the production possibility frontier represent underemployment of resources.
- e. A change in labor productivities will have no impact on the position of a country's production possibility frontier.

**a; Moderate**

27. \_\_\_\_\_ is the quantity of output that can be produced with a unit of labor.
- a. Total product of labor
  - b. Labor productivity
  - c. Unit labor requirement
  - d. The slope of the production possibility frontier
  - e. Marginal revenue product of labor

**b; Easy**

28. Assume a Ricardian model. If the unit labor requirement of a good in Country A is less than that in Country B, we can infer that:
- a. Country A has a larger labor force.
  - b. Country A has a comparative advantage in the production of this good.
  - c. Country A has an absolute advantage in the production of this good.
  - d. Country B has a comparative advantage in the production of this good.
  - e. Country B uses fewer resources to produce the good.

**c; Easy**

29. Country Frasia produces honey and cakes in autarky. Its labor force is fully employed. Identify the correct statement from the following.
- a. The unit labor requirement in the production of cakes is equal to the opportunity cost of honey production.
  - b. The country is operating on a point within the production possibility set but not on the production possibility frontier.
  - c. The slope of the production possibility frontier is given by the marginal cost of production in the economy.
  - d. The production of honey need not decline when the production of cakes is increased.
  - e. The loss in honey production for producing an extra cake is the opportunity cost of cake production.

**e; Moderate**

30. In a Ricardian model if a country has a comparative advantage in the production of a good, it implies:
- a. the country uses fewer resources to produce that good.
  - b. the country can produce the good at a lower labor cost.
  - c. the country has a lower opportunity cost of producing that good.
  - d. the country has a more productive labor force.
  - e. the country also has an absolute advantage in the production of that good.

**c; Easy**

31. In a two-country, two-commodity world, countries Frasia and Tulusia produce honey and bread. Frasia has a comparative advantage in the production of honey. This implies that:
- a. Frasia must give up more bread to produce another ounce of honey as compared to Tulusia.
  - b. Tulusia has a comparative advantage in the production of bread.

- c. the labor cost of producing honey in Frasia is lower than that in Tulusia.
- d. there exist positive externalities from honey production in Frasia.
- e. the production possibility frontier of Tulusia lies inside that of Frasia.

**b; Moderate**

32. If a country has an absolute advantage in the production of both goods, which of the following statements will be true?
- a. It must have comparative advantage in the production of one of the goods.
  - b. It has comparative advantage in the production of both goods.
  - c. It can produce both goods at a higher opportunity cost.
  - d. It can produce both goods at a lower marginal cost.
  - e. Its cost of production for both goods is lower than its trading partner.

**e; Easy**

33. Two countries in the Ricardian model produce cookies and clothes. The unit labor requirements in the production of cookies and clothes in Country A are 2 hours per cookie and 8 hours per rack of clothing respectively. The same in Country B are 6 hours and 12 hours respectively. Identify the correct statement from the following.
- a. Country A is three times more productive in cookie production than Country B.
  - b. Country B is one and a half times more productive in the production of clothes.
  - c. Country B is three times more productive in cookie production than Country A.
  - d. Country A is four times more productive in cookie production than Country B.
  - e. Country B is twice more productive in the production of clothes.

**a; Moderate**

34. Two countries in the Ricardian model produce cookies and coffee. The unit labor requirements in the production of cookies and coffee in Country A are 2 hours per cookie and 8 hours per pound of coffee respectively. The same in Country B are 6 hours and 12 hours respectively. Which of the following statements is true?
- a. Country B does not have comparative advantage in any of the goods.
  - b. Country B should specialize in coffee.
  - c. Country A has a lower opportunity cost in the production of coffee.
  - d. Country A has absolute advantage in the production of cookies only.
  - e. Opportunity cost advantage is greater in coffee production than cookie production in Country A.

**b; Moderate**

35. Two countries in the Ricardian model produce cookies and coffee. The unit labor requirements in the production of cookies and coffee in Country A are 2 hours per cookie and 8 hours per pound of coffee respectively. The unit labor requirement in the production of cookies in Country B is 6 labor hours. If neither country has a comparative advantage in the production of any of the two goods, calculate the unit labor requirement in the production of coffee for Country B.
- a. 8 hours per pound
  - b. 6 hours per pound
  - c. 10 hours per pound
  - d. 16 hours per pound
  - e. 24 hours per pound

**e; Moderate**

36. The unit labor requirements for the production of honey ( $a_{LH}$ ) and bread ( $a_{LB}$ ) for the two countries Frasia and Tulsia are given below. Each country has 100 labor hours available for the production of the two goods.

Frasia	Tulsia
$a_{LH} = 2$ hours per ounce of honey	$a_{LH} = 6$ hours per ounce of honey
$a_{LB} = 3$ hours per loaf of bread	$a_{LB} = 4$ hours per loaf of bread

Refer to the table and identify the correct statement from the following.

- Frasia has a comparative advantage in the production of both goods.
- Tulsia's opportunity cost of producing a pound of bread is  $2/3$  ounces of honey.
- Frasia's opportunity cost of producing an ounce of honey is  $3/2$  pounds of bread.
- Frasia's production possibility frontier lies within Tulsia's.
- The slope of Tulsia's production possibility frontier is same as Frasia's.

**b; Moderate**

37. Which of the following statements is true about autarky in a Ricardian model?
- The country specializes in the production of that good in which its opportunity cost is lowest.
  - The production point in autarky lies below the production possibilities curve.
  - The production and consumption point for the country are the same.
  - The country consumes more than it produces.
  - The country produces more than it consumes.

**c; Easy**

38. A country in autarky has 1,500 labor hours available for producing corn and bags. The unit labor requirements for a bushel of corn and a bag are 10 and 5 labor hours respectively. Assuming a Ricardian model, if the country produces 100 bushels of corn, how many bags will it produce?
- 100
  - 50
  - 150
  - 25
  - 125

**a; Moderate**

39. Which of the following statements is true of a country that moves from autarky to trade?
- Consumption exceeds production of the import good once the country begins to trade.
  - Production exceeds consumption of the import good once the country begins to trade.
  - The production possibility frontier becomes flatter when the country begins to trade.
  - The production possibility frontier becomes steeper when the country begins to trade.
  - The production possibility set increases as the country opens to trade.

**a; Easy**

40. An increase in world production efficiency occurs when:
- resource endowments increase.
  - countries specialize according to comparative advantage.
  - labor is becomes unemployed.

- d. production is increased by hiring more workers.
- e. unit labor requirements increase.

**b; Easy**

41. Country Omania exports 100 tons of spices to country Lorenz and imports 125 tons of coffee. Calculate the terms of trade between these two nations.
- a. 1.25 tons of coffee per ton of spices
  - b. 0.13 tons of coffee per ton of spices
  - c. 0.8 tons of coffee per ton of spices
  - d. 1.25 tons of spices per ton of coffee
  - e. 0.13 tons of spices per ton of coffee

**a; Easy**

42. Suppose  $Q$  = quantity of a good produced,  $P$  = market price of the good,  $L$  = total labor hours used for production, and  $w$  = wage rate. Derive the wage rate from the zero profit condition under perfect competition.

- a.  $w = Q \cdot P \cdot L$
- b.  $w = P \cdot L / Q$
- c.  $w = Q \cdot P / L$
- d.  $w = Q \cdot L / P$
- e.  $w = P / Q \cdot L$

**c; Easy**

43. Suppose a country with perfectly competitive markets produces 300 units of a good which is priced at \$4 per unit. The nominal wage of the workers employed in this industry is \$20 per day. Calculate the number of workers employed in this industry.

- a. 60
- b. 75
- c. 15
- d. 5
- e. 150

**a; Easy**

44. Suppose the market price of good A is \$50 per unit and the unit labor requirement is 9 labor hours per unit. Calculate the nominal wage received by the workers producing good A.

- a. \$450
- b. \$5.56
- c. \$45
- d. \$4.5
- e. \$5

**b; Easy**

45. The autarky terms of trade in the Ricardian model is defined as:

- a. the terms at which the country exports the commodity it specializes in.
- b. equal to the ratio of the wages paid to the workers of the two industries.
- c. the ratio of the unit labor requirements in the two industries.
- d. the terms at which the country imports the commodity it specializes in.
- e. equal to the marginal cost of producing the commodity it specializes in.

**c; Easy**

46. The unit labor requirement for the production of tables and wool in a country is 4 hours per table and 6 hours per bale, respectively. Calculate the autarky terms of trade.
- 0.67 table per bale of wool
  - 1.5 tables per bale of wool
  - 0.41 table per bale of wool
  - 2.4 tables per bale of wool
  - 1 table per bale of wool
- a; Easy**
47. The invisible hand mechanism refers to:
- the ability of trade to raise welfare.
  - the ability of trade to increase wages.
  - the ability of the market to allocate resources efficiently.
  - the ability of the market to increase welfare of the workers.
  - the ability of individuals to maximize utility without conscious effort.
- c; Easy**
48. Consider a Ricardian model in which two countries Auzia and Peruvia, produce apples and coffee. If the autarky price ratio of apples to coffee in Auzia is less than Peruvia, which of the following statements will be true?
- You can buy more coffee with a ton of apples in Peruvia
  - The supply of apples in Peruvia is higher than Auzia.
  - Auzia has an absolute advantage in the production of apples.
  - Auzia specializes in coffee production.
  - Peruvia specializes in apple production.
- a; Easy**
49. Suppose a country in the Ricardian model produces pies and honey. Once trade begins, the relative price changes such that the country can now buy more pies with an ounce of honey. This implies:
- the country is an exporter of pies.
  - the country has a lower opportunity cost of producing pies than its trading partner.
  - the country has a lower opportunity cost than its trading partner in the production of both goods.
  - the country is an exporter of honey.
  - the country's autarky price ratio of honey to pies was higher than the free trade price.
- d; Moderate**
50. Suppose a country Peruvia, operating in the Ricardian model, has comparative advantage in the production of good A, while its trading partner has a comparative advantage in the production of good B. Once trade commences between the two countries, the free trade price ratio,  $P_A/P_B$ ,:
- causes wages to equalize across sectors within Peruvia.
  - equals the marginal cost of producing good A in Peruvia.
  - causes prices to rise in both countries.
  - exceeds the opportunity cost of producing good A in Peruvia.
  - causes the price of good A to increase in the other country.
- d; Easy**
51. Suppose two countries producing two goods in the Ricardian model begin to trade with each other. \_\_\_\_\_ increases in both countries once free trade begins.

- a. Terms of trade
  - b. Price of the import good
  - c. Real wage in terms of the import good
  - d. Inflation
  - e. Opportunity cost
- c; Easy**

52. A worker earns \$20 per hour for producing toys which sell at \$4 each. Calculate the real wage of the worker.
- a. 80 toys per hour
  - b. 5 toys per hour
  - c. 8 toys per hour
  - d. 20 toys per hour
  - e. 4 toys per hour
- b; Easy**

53. In autarky, the amount of a good a worker can produce in an hour:
- a. is exactly equal to the amount of the good the worker can buy with his wage.
  - b. is greater than his hourly wage rate.
  - c. is equal to his hourly nominal wage.
  - d. is exactly equal to the marginal cost of production.
  - e. is less than his hourly wage rate.
- a; Easy**

54. In a Ricardian model where a country produces cheese and wine, the real wage of cheese workers in terms of wine in autarky is:
- a. equal to the labor productivity in the wine industry.
  - b. the product of unit labor requirement in the cheese industry and the cheese-to-wine price ratio.
  - c. the product of labor productivity in the cheese industry and the cheese-to-wine price ratio.
  - d. the labor productivity in the cheese industry divided by the cheese-to-wine price ratio.
  - e. equal to the price ratio.
- a; Easy**

55. Assume a Ricardian model where a country produces cheese and wine. In autarky, the real wage of cheese workers in terms of wine and the real wage of wine workers in terms of wine are:
- a. equal.
  - b. inversely proportional.
  - c. unrelated.
  - d. equal to the unit labor requirement in the wine industry.
  - e. equal to the labor productivity in the cheese industry.
- a; Moderate**

56. Consider a Ricardian model in which a country produces cheese and wine. The autarky prices of wine and cheese are  $P_w = \$5$ ,  $P_c = \$8$ . Unit labor requirements in the wine and cheese industries are 8 hours per gallon and 4 hours per pound, respectively. Calculate the autarky real wage of wine workers in terms of cheese.
- a. 0.25 pounds per hour
  - b. 0.125 pounds per hour

- c. 0.5 pounds per hour
- d. 0.625 pounds per hour
- e. 0.3 pounds per hour

**a; Moderate**

57. When the autarky price ratio of cheese to wine in Country A is less than that in Country B, it implies:
- a. the price of cheese in Country B will rise after trade.
  - b. the price of cheese in Country A will fall after trade.
  - c. Country A specializes in the production of wine.
  - d. free trade price ratio of cheese to wine will be higher than the autarky price ratio of Country A.
  - e. free trade price ratio cheese to wine will be lower than the autarky price ratio of Country A.

**d; Easy**

58. When a country moves to free trade, the real wage of the workers \_\_\_\_\_.
- a. remains unchanged in terms of the export good
  - b. increases in terms of the export good
  - c. falls in terms of the import good
  - d. remains unchanged in terms of the import good
  - e. falls in terms of the export good

**a; Easy**

59. Trade enables countries to achieve:
- a. higher utility from consumption.
  - b. higher profits from production.
  - c. higher costs of production.
  - d. equal standards of living.
  - e. a larger production possibility set.

**a; Easy**

60. National welfare can be represented by:
- a. the production possibility frontier.
  - b. a set of aggregate indifference curves plotted in a production possibility frontier diagram.
  - c. higher nominal wages from trade.
  - d. higher prices.
  - e. a set of isoquants plotted in a production possibility frontier diagram.

**b; Easy**

### Short Answer Questions

1. What are the sources of international trade?  
Advantageous trade can occur between countries if the countries differ in their technological abilities, resource endowments, or demand. Existence of economies of scale in the production of a good is also sufficient to generate trade between countries. The change in the prices of goods and services caused by imposition of taxes or subsidies can also induce trade.

**Easy**

2. "A developed country's superior technology need not imply that industries in less-developed country (LDC) cannot compete in international markets." Justify the statement.  
Even when one country is technologically superior to the other in both industries, one of these industries would go out of business when opening to free trade. Thus technological superiority is not enough to guarantee continued production of a good in free trade. A country must have a comparative advantage in production of a good rather than an absolute advantage to guarantee continued production in free trade. From the perspective of a less-developed country therefore, the developed country's superior technology need not imply that less-developed country (LDC) industries cannot compete in international markets.  
**Easy**
  
3. What does the Ricardian theory of comparative advantage suggest?  
The theory of comparative advantage suggests that if total output is to be maximized, then all countries must fully employ their resources and allocate these resources to each country's comparative advantage industries. Trade in comparative advantage goods raises the well-being of all workers despite the differences in relative productivities.  
**Easy**
  
4. What are the basic assumptions of the Ricardian trade model?  
The Ricardian model assumes that there are two countries producing two goods using one factor of production, usually labor. The model is a general equilibrium model in which all markets (i.e., goods and factors) are perfectly competitive. The goods produced are assumed to be homogeneous across countries and firms within an industry. Goods can be costlessly shipped between countries (i.e., there are no transportation costs). Labor is homogeneous within a country but may have different productivities across countries. This implies that the production technology is assumed to differ across countries. Labor is costlessly mobile across industries within a country but is immobile across countries. Full employment of labor is also assumed. Consumers (the laborers) are assumed to maximize utility subject to an income constraint.  
**Easy**
  
5. What is a production possibility frontier?  
A production possibility frontier (PPF) describes all possible production combinations of goods that can be achieved by fully employing all resources in the economy. A movement along the curve represents a transfer of labor resources out of one industry and into another such that all labor remains employed. Points inside the PPF are production possibilities but correspond to underemployment of labor resources. Points outside the PPF are unattainable given the country's resource endowments.  
**Easy**
  
6. What is the difference between absolute and comparative advantage?  
A country has absolute advantage in the production of a good relative to another country if it can produce the good at lower cost or with higher productivity. Absolute advantage compares industry productivities across countries. A country has a comparative advantage in the production of a good if it can produce that good at a lower opportunity cost relative to another country.  
**Easy**
  
7. Why are industries characterized by zero economic profit in the Ricardian model?  
The Ricardian theory of trade assumes perfect competition in all industries. Perfect competition is characterized by free entry and exit of firms in response to economic profit. If

positive profits are being made in one industry, then because of perfect information, profit-seeking entrepreneurs will begin to open more firms in that industry. The entry of firms, however, raises industry supply, which forces down the product price and reduces profit for every other firm in the industry. Entry continues until economic profit is driven to zero. The same process occurs in reverse when profit is negative for firms in an industry. In this case, exit continues until economic profit is raised to zero. This implies that if production occurs in a perfectly competitive industry, be it in autarky or free trade, then economic profit must be zero.

**Moderate**

8. The autarky price ratio of Country A is lower than that in Country B which produces the same two goods. If these two countries start trading, what can be concluded about the free trade price ratio?

Differences in price ratios between countries and the desire to make more profit are sufficient to generate international trade. Higher price for a good in Country A induces the producers of the same good in Country B to sell their product in A. Similarly, producers of the other good in Country A will find it more profitable to sell their product in Country B. These shifts in supply will continue as long as the prices for the goods continue to differ between the two markets. Once the prices are equalized, there will be no incentive to trade any additional amount. The free trade prices will be those prices that equalize total supply of each good in the world with total demand for each good. As a result of trade, the price ratio, or terms of trade, will lie in between the two countries' autarky price ratios.

**Moderate**

9. When countries move to free trade, what happens to the real wage with respect to its exported good and why?

When countries move to free trade, the real wage with respect to the exported good of each country remains unchanged. This is because in the Ricardian model the real wage with respect to the exported good is equal to labor productivity, and labor productivity in an industry does not change when a country moves from autarky to trade.

**Easy**

**Essay**

1. Assume a Ricardian model of two economies and two goods where each country has a comparative advantage in the production of one of the goods. When free trade begins between these two countries, what are the effects on the price and quantity produced of the home country's comparative advantage good?

The Ricardian model explains trade caused by differences in technology. Because of the technology differences, relative prices of the two goods differ between countries. The price of each country's comparative advantage good is lower than the price of the same good in the other country under autarky.

The initial differences in relative prices between countries in autarky will stimulate trade between the countries. Profit-seeking firms in each country's comparative advantage industry would recognize that the price of their good is higher in the other country. Since transportation costs are zero, more profit can be made through export than with sales domestically. Thus, each country would export the good in which they have a comparative advantage. Trade flows would increase until the price of each good is equal across countries.

In the end, the price of each country's export good (its comparative advantage good) will rise and the price of its import good (its comparative disadvantage good) will fall.

The higher price received for each country's comparative advantage good would lead each country to specialize in that good. To accomplish this, labor would have to move from the comparative disadvantaged industry into the comparative advantage industry. This means that one industry goes out of business in each country. However, because the model assumes full employment and costless mobility of labor, all these workers are immediately gainfully employed in the other industry.

**Easy**

2. List four assumptions of perfectly competitive markets?

Perfect competition in all markets means that the following conditions are assumed to hold.

- Many firms produce output in each industry such that each firm is too small for its output decisions to affect the market price. This implies that when choosing output to maximize profit, each firm takes the price as given or exogenous.
- Firms choose output to maximize profit. The rule used by perfectly competitive firms is to choose the output level that equalizes the price ( $P$ ) with the marginal cost ( $MC$ ). That is, set  $P = MC$ .
- Output is homogeneous across all firms. This means that goods are identical in all their characteristics such that a consumer would find products from different firms indistinguishable. We could also say that goods from different firms are perfect substitutes for all consumers.
- Free entry and exit of firms in response to profits. Positive profit sends a signal to the rest of the economy and new firms enter the industry. Negative profit (losses) leads existing firms to exit, one by one, out of the industry. As a result, in the long run economic profit is driven to zero in the industry.
- Perfect information. All firms have the necessary information to maximize profit, to identify the positive profit and negative profit industries, and so on.

**Easy**

3. "The likely welfare effect of free trade, then, is that everyone in both trading countries benefits." Justify this statement. Under what circumstances would an individual not benefit? Suppose two countries A and B produce cheese and wine, such that A's comparative advantage is in producing cheese while B's advantage is in producing wine. The autarky real wage of workers producing cheese in terms of cheese is given by the labor productivity in the cheese industry. Since the unit labor requirement for cheese does not change in moving to free trade, there is also no change in the real wage in terms of cheese. However, since the price of cheese in terms of wine rises, cheese workers in A can get more wine for each unit of cheese in exchange. Thus the real wage of cheese workers in terms of wine rises. This means cheese workers are at least as well off in free trade as they were in autarky.

The worst outcome occurs if a cheese worker has no demand for wine. Perhaps an individual abstains from alcohol consumption. In this case, the worker would be able to buy just as much cheese in free trade as in autarky, but no more. Such a person would receive no benefit from free trade. However, every worker who demands both wine and cheese will be able to buy more of both goods.

As for the workers who worked in the wine industry in Country A in autarky, they are now cheesemakers earning cheesemaker wages. Since real wages for wine workers were the same

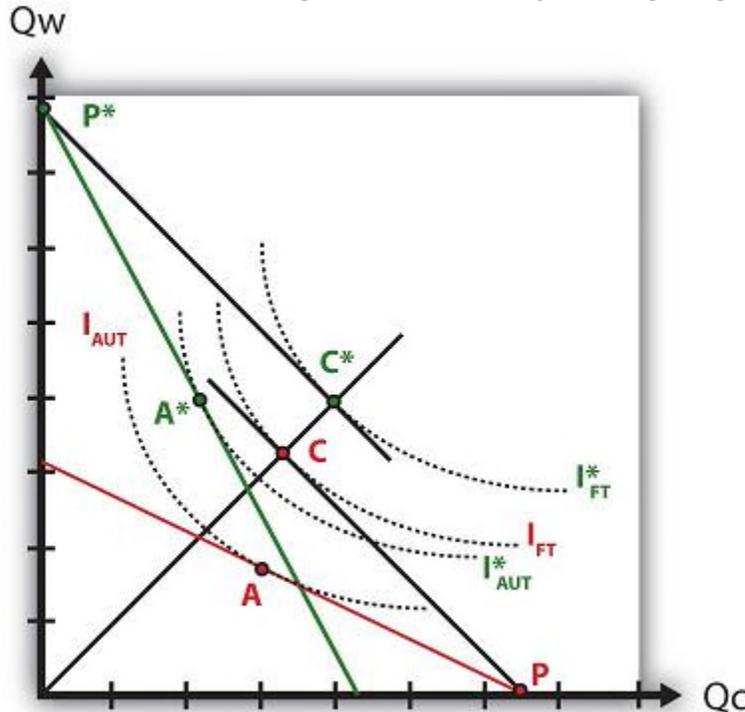
as wages for cheese workers in autarky, and since cheese workers are no worse off with free trade, then wine workers must also be no worse off in free trade. Of course, the model assumes that the movement of workers from one industry to another is costless. In Country B, the real wage of winemakers in terms of how much wine they can buy remains constant, while the real wage in terms of cheese must go up. Cheesemakers in Country B have all become winemakers because of specialization, which means all workers are no worse off and most likely better off as a result of free trade.

The Ricardian model assumes labor is freely mobile between industries within the country. If this assumption were changed, and labor mobility restricted to intra-industry movement, then every individual would not benefit from trade. In this case, each country would continue to produce both goods even after trade and workers in the import-competing sector would be worse off from free trade.

**Moderate**

4. Explain with a diagram how welfare gains from trade are measured with the help of indifference curves.

One way to evaluate the effects of free trade uses an aggregate welfare function to depict the overall welfare effects that would accrue to the nation. This method allows one to demonstrate the benefits that arise from increased production and consumption efficiency. National welfare can be represented with a set of aggregate indifference curves plotted in a production possibility frontier diagram. It can be shown that free trade allows each country to achieve a higher aggregate level of welfare. Each country's consumption point is on a higher indifference curve, as compared to their autarky consumption point.



The above figure compares the autarky and free trade equilibriums for USA and France, which produce wine and cheese. The U.S. autarky production and consumption points are determined where the aggregate indifference curve is tangent to the U.S. PPF. This

occurs at the red point  $A$ . The United States realizes a level of aggregate utility that corresponds to the indifference curve  $I_{Aut}$ .

The U.S. production and consumption points in free trade are at the red  $P$  and  $C$ , respectively. The United States specializes in production of its comparative advantage good but trades to achieve its consumption point at the red  $C$ . In free trade, the United States realizes a level of aggregate utility that corresponds to the indifference curve  $I_{FT}$ . Since the free trade indifference curve  $I_{FT}$  lies to the northeast of the autarky indifference curve  $I_{Aut}$ , national welfare rises as the United States moves to free trade.

France's autarky production and consumption points are determined by finding the aggregate indifference curve that is tangent to the French PPF. This occurs at the green point  $A^*$ . France realizes a level of aggregate utility that corresponds to the indifference curve  $I_{Aut}^*$ .

French production and consumption points in free trade are the green  $P^*$  and  $C^*$ , respectively. In free trade, France realizes a level of aggregate utility that corresponds to the indifference curve  $I_{FT}^*$ . Since the free trade indifference curve  $I_{FT}^*$  lies to the northeast of the autarky indifference curve  $I_{Aut}^*$ , national welfare rises as France moves to free trade.

**Moderate**

### Fill in the Blanks

1. The basis for trade in the Ricardian model of comparative advantage is differences in \_\_\_\_\_.  
**technology; Easy**
2. Identification of a country's comparative advantage good requires a comparison of \_\_\_\_\_ across countries.  
**opportunity costs or relative productivities; Easy**
3. In a Ricardian model, if one country has an absolute advantage in the production of both goods, then real wages of workers in that country will be \_\_\_\_\_ compared to wages in the other country.  
**higher in both industries; Easy**
4. Free entry and exit ensures economic profit is \_\_\_\_\_ in a perfectly competitive industry.  
**zero; Easy**
5. \_\_\_\_\_ are those variables which are determined when the model is solved.  
**Endogenous variables; Easy**
6. Points \_\_\_\_\_ the PPF are production possibilities but correspond to underemployment of labor resources.  
**inside; Easy**
7. \_\_\_\_\_ is defined as the quantity of output that can be produced with a unit of labor.  
**Labor productivity; Easy**
8. Neither country has a comparative advantage in any of the commodities when \_\_\_\_\_ are equal in both countries.  
**opportunity costs; Easy**

9. An increase in world output given the same level of inputs is called an increase in \_\_\_\_\_.  
**world productive efficiency; Easy**
10. Nominal wages to workers in each industry under autarky equals the output price divided by the \_\_\_\_\_ in that industry.  
**unit labor requirement; Easy**
11. Trade between two countries will push the lower autarky price ratio \_\_\_\_\_ and the higher autarky price ratio \_\_\_\_\_.  
**up; lower; Easy**
12. After trade begins, there is \_\_\_\_\_ in the real wage of workers of a country in terms their comparative advantage good.  
**no change; Easy**