

Comparative Advantage and Trade: Worksheet with Solutions

Canada and Mexico

Suppose that we have the following data on one week of production possibilities for Canada and Mexico:

	Computers	Bushels of Wheat
Canada	12	18
Mexico	24	6

You may assume that both countries face constant opportunity costs. These data represent the endpoints of the production possibilities frontiers.

- i) Which country has absolute advantage in producing computers? Which country has absolute advantage in producing wheat? Explain how you can tell.

Mexico has absolute advantage in producing computers because it can produce twenty-four computers, while Canada can produce only twelve computers.

Canada has absolute advantage in producing wheat because it can produce eighteen bushels of wheat, while Mexico can produce only six bushels of wheat.

Absolute advantage is determined by comparing the maximum possible output of each good across countries.

- ii) Calculate the opportunity cost of each good in each country. Show your calculations starting from the endpoints of the production possibilities frontiers.

Canada

The endpoints of the production possibilities frontier imply that producing eighteen bushels of wheat requires giving up twelve computers:

$$18 \text{ bushels of wheat} = 12 \text{ computers.}$$

Dividing both sides by eighteen:

$$1 \text{ bushel of wheat} = \frac{12}{18} \text{ computers} = \frac{2}{3} \text{ of a computer.}$$

Therefore, the opportunity cost of one bushel of wheat in Canada is two-thirds of a computer.

The opportunity cost of one computer is the inverse:

$$1 \text{ computer} = \frac{18}{12} \text{ bushels of wheat} = \frac{3}{2} \text{ bushels of wheat.}$$

Mexico

The endpoints of the production possibilities frontier imply that producing six bushels of wheat requires giving up twenty-four computers:

$$6 \text{ bushels of wheat} = 24 \text{ computers.}$$

Dividing both sides by six:

$$1 \text{ bushel of wheat} = 4 \text{ computers.}$$

Therefore, the opportunity cost of one bushel of wheat in Mexico is four computers.

The opportunity cost of one computer is:

$$1 \text{ computer} = \frac{6}{24} \text{ bushels of wheat} = \frac{1}{4} \text{ of a bushel of wheat.}$$

- iii) Which country has comparative advantage in producing computers? Which country has comparative advantage in producing wheat? Explain your reasoning.

Mexico has comparative advantage in producing computers because the opportunity cost of one computer in Mexico is lower than in Canada.

Canada has comparative advantage in producing wheat because the opportunity cost of one bushel of wheat in Canada is lower than in Mexico.

Comparative advantage means producing a good at a lower opportunity cost.

- iv) If each country specializes according to comparative advantage:

- Which good will each country produce?
- What is total world production of computers and wheat?

Canada will specialize in producing wheat, and Mexico will specialize in producing computers.

Canada produces eighteen bushels of wheat and zero computers. Mexico produces twenty-four computers and zero bushels of wheat.

Total world production after specialization is twenty-four computers and eighteen bushels of wheat.

- v) Suppose the countries specialize as in part (iv). Find the range of terms of trade that both countries would agree to. Express the terms of trade as the number of bushels of wheat per computer.

The terms of trade are measured as the number of bushels of wheat per computer.

Mexico is exporting computers and is willing to accept no fewer than one-quarter of a bushel of wheat per computer.

Canada is importing computers and is willing to pay no more than three-halves of a bushel of wheat per computer.

Therefore, mutually acceptable terms of trade satisfy:

$$\frac{1}{4} \leq \text{bushels of wheat per computer} \leq \frac{3}{2}.$$

- vi) For each of the following proposed trades, determine whether both countries would agree. If not, indicate which country would reject the trade and why.
- a) Six bushels of wheat for six computers
 - b) Ten bushels of wheat for four computers
 - c) Twelve bushels of wheat for two computers

a) Six bushels of wheat for six computers implies one bushel of wheat per computer. This price lies between one-quarter and three-halves, so both countries would agree.

b) Ten bushels of wheat for four computers implies two and one-half bushels of wheat per computer. This price is above the maximum Canada is willing to pay, so Canada would reject the trade.

c) Twelve bushels of wheat for two computers implies six bushels of wheat per computer. This price is far above the maximum Canada is willing to pay, so Canada would reject the trade.

- vii) Suppose the two countries trade four computers for ten bushels of wheat. How much of each good does each country consume after trade?

Canada produces eighteen bushels of wheat and trades away ten bushels of wheat in exchange for four computers. Canada consumes four computers and eight bushels of wheat.

Mexico produces twenty-four computers and trades away four computers in exchange for ten bushels of wheat. Mexico consumes twenty computers and ten bushels of wheat.

- viii) Consider the following production plans under autarky, meaning no trade:

- Canada produces four computers and twelve bushels of wheat.
- Mexico produces two computers and four bushels of wheat.

Using these as the no-trade baseline, quantify the gains from trade for each country.

Canada consumes four computers and eight bushels of wheat with trade, compared to four computers and twelve bushels of wheat without trade. Canada does not gain from this trade.

Mexico consumes twenty computers and ten bushels of wheat with trade, compared to two computers and four bushels of wheat without trade. Mexico gains eighteen computers and six bushels of wheat from trade.

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