Seventh Edition

Principles of
Economics

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CHAPTER
3

Interdependence and the Gains from Trade

Modified by Joseph Tao-yi Wang

In this chapter, look for the answers to these questions

- Why do people—and nations—choose to be economically interdependent?
- How can trade make everyone better off?
- What is absolute advantage?
  What is comparative advantage?
  How are these concepts similar?
  How are they different?

Interdependence

Every day you rely on many people from around the world, most of whom you've never met, to provide you with the goods and services you enjoy.

Interdependence

- One of the Ten Principles from Chapter 1:
  Trade can make everyone better off.
- We now learn why people—and nations—choose to be interdependent, and how they can gain from trade.

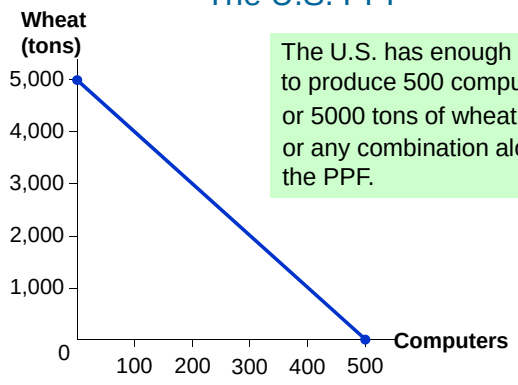
Our Example

- Two countries: the U.S. and Japan
- Two goods: computers and wheat
- One resource: labor, measured in hours
- We will look at how much of both goods each country produces and consumes
  - if the country chooses to be self-sufficient
  - if it trades with the other country

Production Possibilities in the U.S.

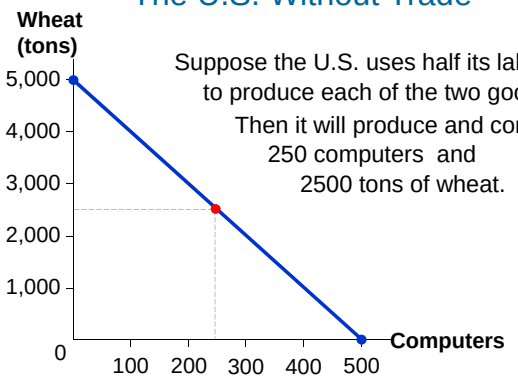
- The U.S. has 50,000 hours of labor available for production, per month.
- Producing one computer requires 100 hours of labor.
- Producing one ton of wheat requires 10 hours of labor.

The U.S. PPF



The U.S. has enough labor to produce 500 computers, or 5000 tons of wheat, or any combination along the PPF.

The U.S. Without Trade



Suppose the U.S. uses half its labor to produce each of the two goods.

Then it will produce and consume 250 computers and 2500 tons of wheat.

ACTIVE LEARNING 1

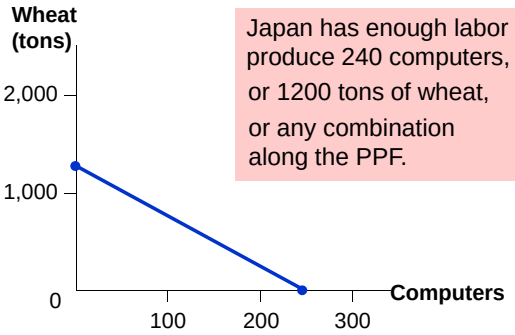
Derive Japan's PPF

Use the following information to draw Japan's PPF.

- Japan has 30,000 hours of labor available for production, per month.
- Producing one computer requires 125 hours of labor.
- Producing one ton of wheat requires 25 hours of labor.

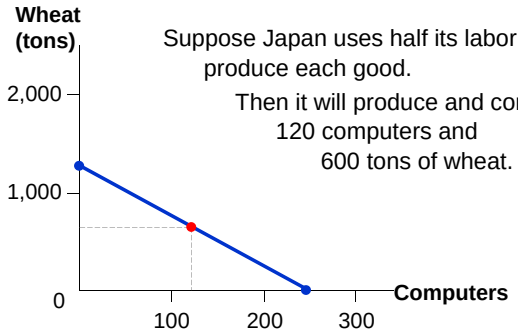
Your graph should measure computers on the horizontal axis.

Japan's PPF



Japan has enough labor to produce 240 computers, or 1200 tons of wheat, or any combination along the PPF.

Japan Without Trade



Suppose Japan uses half its labor to produce each good.

Then it will produce and consume 120 computers and 600 tons of wheat.

Consumption With and Without Trade

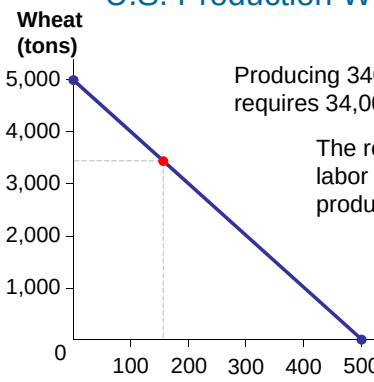
- Without trade,
  - U.S. consumers get 250 computers and 2500 tons wheat.
  - Japanese consumers get 120 computers and 600 tons wheat.
- We will compare consumption without trade to consumption with trade.
- First, we need to see how much of each good is produced and traded by the two countries.

ACTIVE LEARNING 2

Production under trade

1. Suppose the U.S. produces 3400 tons of wheat. How many computers would the U.S. be able to produce with its remaining labor? Draw the point representing this combination of computers and wheat on the U.S. PPF.
2. Suppose Japan produces 240 computers. How many tons of wheat would Japan be able to produce with its remaining labor? Draw this point on Japan's PPF.

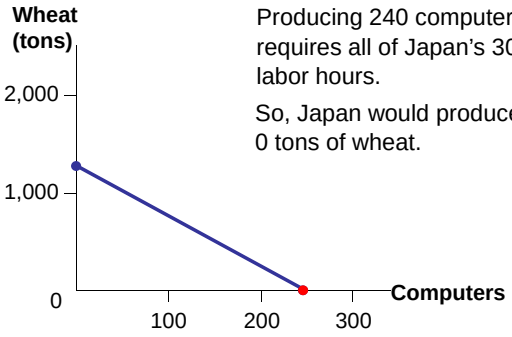
U.S. Production With Trade



Producing 3400 tons of wheat requires 34,000 labor hours.

The remaining 16,000 labor hours are used to produce 160 computers.

Japan's Production With Trade



Producing 240 computers requires all of Japan's 30,000 labor hours.

So, Japan would produce 0 tons of wheat.

Exports & Imports

- **Exports**:
  goods produced domestically and sold abroad
- **Imports**:
  goods produced abroad and sold domestically

ACTIVE LEARNING 3

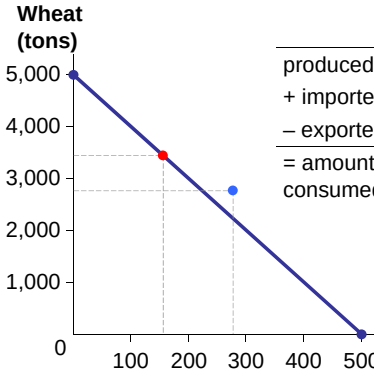
Consumption under trade

Suppose the U.S. exports 700 tons of wheat to Japan, and imports 110 computers from Japan.

(So, Japan imports 700 tons wheat and exports 110 computers.)

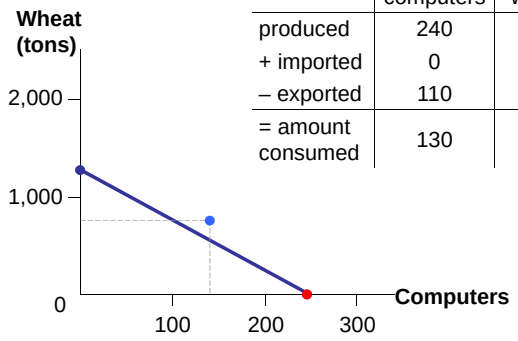
- How much of each good is consumed in the U.S.? Plot this combination on the U.S. PPF.
- How much of each good is consumed in Japan? Plot this combination on Japan's PPF.

U.S. Consumption With Trade



	computers	wheat
produced	160	3400
+ imported	110	0
– exported	0	700
= amount consumed	270	2700

Japan's Consumption With Trade



	computers	wheat
produced	240	0
+ imported	0	700
– exported	110	0
= amount consumed	130	700

Trade Makes Both Countries Better Off

U.S.			
	consumption without trade	consumption with trade	gains from trade
computers	250	270	**20**
wheat	2500	2700	**200**
Japan			
	consumption without trade	consumption with trade	gains from trade
computers	120	130	**10**
wheat	600	700	**100**

Where Do These Gains Come From?

- **Absolute advantage**: the ability to produce a good using fewer inputs than another producer
- The U.S. has an absolute advantage in wheat: producing a ton of wheat uses 10 labor hours in the U.S. vs. 25 in Japan.
- If each country has an absolute advantage in one good and specializes in that good, then both countries can gain from trade.

Where Do These Gains Come From?

- Which country has an absolute advantage in computers?
- Producing one computer requires
  125 labor hours in Japan,
  but only 100 in the U.S.
- The U.S. has an absolute advantage in <u>both</u> goods!

So why does Japan specialize in computers? Why do <u>both</u> countries gain from trade?

Two Measures of the Cost of a Good

- Two countries can gain from trade when each specializes in the good it produces at lowest cost.
- Absolute advantage measures the cost of a good in terms of the inputs required to produce it.
- Recall:
  Another measure of cost is *opportunity cost.*
- In our example, the opportunity cost of a computer is the amount of wheat that could be produced using the labor needed to produce one computer.

Opportunity Cost and Comparative Advantage

- **Comparative advantage**: the ability to produce a good at a lower opportunity cost than another producer
- Which country has the comparative advantage in computers?
- To answer this, must determine the opportunity cost of a computer in each country.

Opportunity Cost and Comparative Advantage

- The opportunity cost of a computer is
  - 10 tons of wheat in the U.S.:
    Producing one computer requires 100 labor hours, which instead could produce 10 tons of wheat.
  - 5 tons of wheat in Japan:
    Producing one computer requires 125 labor hours, which instead could produce 5 tons of wheat.
- So, Japan has a comparative advantage in computers. *Lesson: Absolute advantage is not necessary for comparative advantage!*

Comparative Advantage and Trade

- Gains from trade arise from comparative advantage (differences in opportunity costs).
- When each country specializes in the good(s) in which it has a comparative advantage, total production in all countries is higher, the world's "economic pie" is bigger, and all countries can gain from trade.
- The same applies to individual producers (like Farmer Frank and Rancher Rose) who benefit by specializing in different goods and trading with each other.

ACTIVE LEARNING 4

Absolute and comparative advantage

Argentina and Brazil each have 10,000 hours of labor per month.

In Argentina,
- producing one pound coffee requires 2 hours
- producing one bottle wine requires 4 hours

In Brazil,
- producing one pound coffee requires 1 hour
- producing one bottle wine requires 5 hours

Which country has an absolute advantage in the production of coffee? Which country has a comparative advantage in the production of wine?

ACTIVE LEARNING 4

Answers

Brazil has an absolute advantage in coffee:
- Producing a pound of coffee requires only one labor-hour in Brazil, but two in Argentina.

Argentina has a comparative advantage in wine:
- Argentina's opp. cost of wine is two pounds of coffee, because the four labor-hours required to produce a bottle of wine could instead produce two pounds of coffee.
- Brazil's opp. cost of wine is five pounds of coffee.

Unanswered Questions…

- We made a lot of assumptions about the quantities of each good that each country produces, trades, and consumes, and the price at which the countries trade wheat for computers.
- In the real world, these quantities and prices would be determined by the preferences of consumers and the technology and resources in both countries.
- We will begin to study this in the next chapter.
- For now, though, our goal was merely to see how ***trade can make everyone better off***.

Summary

- Interdependence and trade allow everyone to enjoy a greater quantity and variety of goods & services.
- Comparative advantage means being able to produce a good at a lower opportunity cost. Absolute advantage means being able to produce a good with fewer inputs.
- When people—or countries—specialize in the goods in which they have a comparative advantage, the economic "pie" grows and trade can make everyone better off.

Chapter 3: Gains From Trade

- Trade can make people better off
- Key Idea: Comparative Advantage
- Suggested Homework:
  - Read Mankiw Chap. 3
  - Mankiw Chap.3, Problem 2, 3, 8, 9