ECO2011 Basic Microeconomics

Mankiw Chapter 3 (Comparative advantage)

2025

Agenda

1. Motivation
2. Production Possibilities Frontier
3. Trade can make everyone better off
    1) Example 1: U.S. & Japan
    2) Example 2: Sherlock Holmes & Dr. Watson
    3) Case Study: Planet Money T-shirts

Motivation: Trump's Trade War

"This is one of the most important days, in my opinion, in American history. It's our declaration of economic independence."

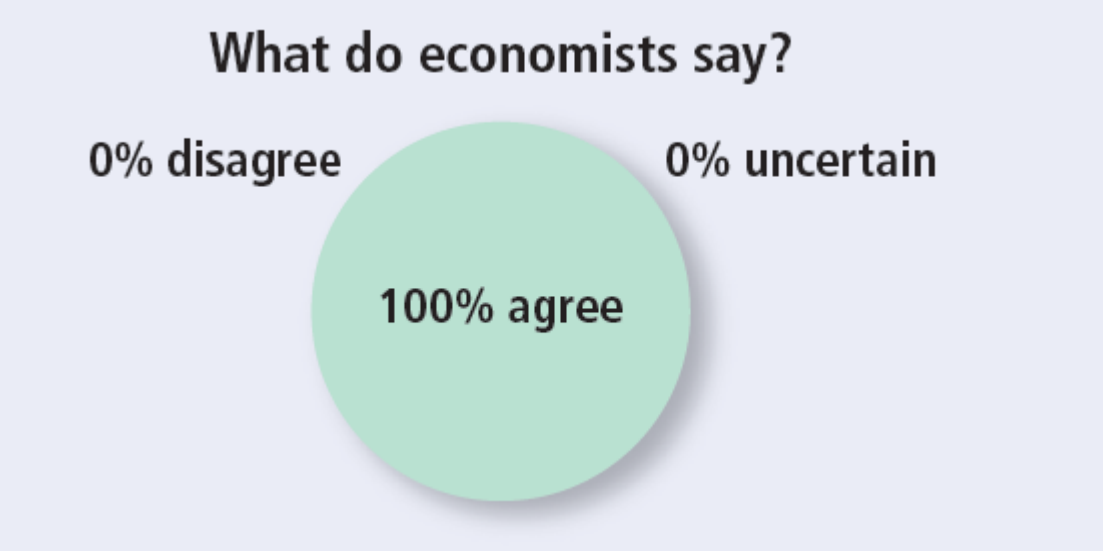
—Donald Trump

April 2, 2025

Source: https://edition.cnn.com/2025/05/28/business/us-court-blocks-trumps-tariffs

What do economists say?

- "Trade with China makes most Americans better off because, among other advantages, they can buy goods that are made or assembled more cheaply in China."



Interdependence

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

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Production Possibilities Frontier

- The Production Possibilities Frontier (PPF): A graph that shows the combinations of two goods the economy can possibly produce given the available resources and the available technology.
  - Is PPF a positive or normative tool?
- Example:
  - Two goods: computers and wheat
  - One resource: labor (measured in hours)
  - Economy has 50,000 labor hours per month available for production

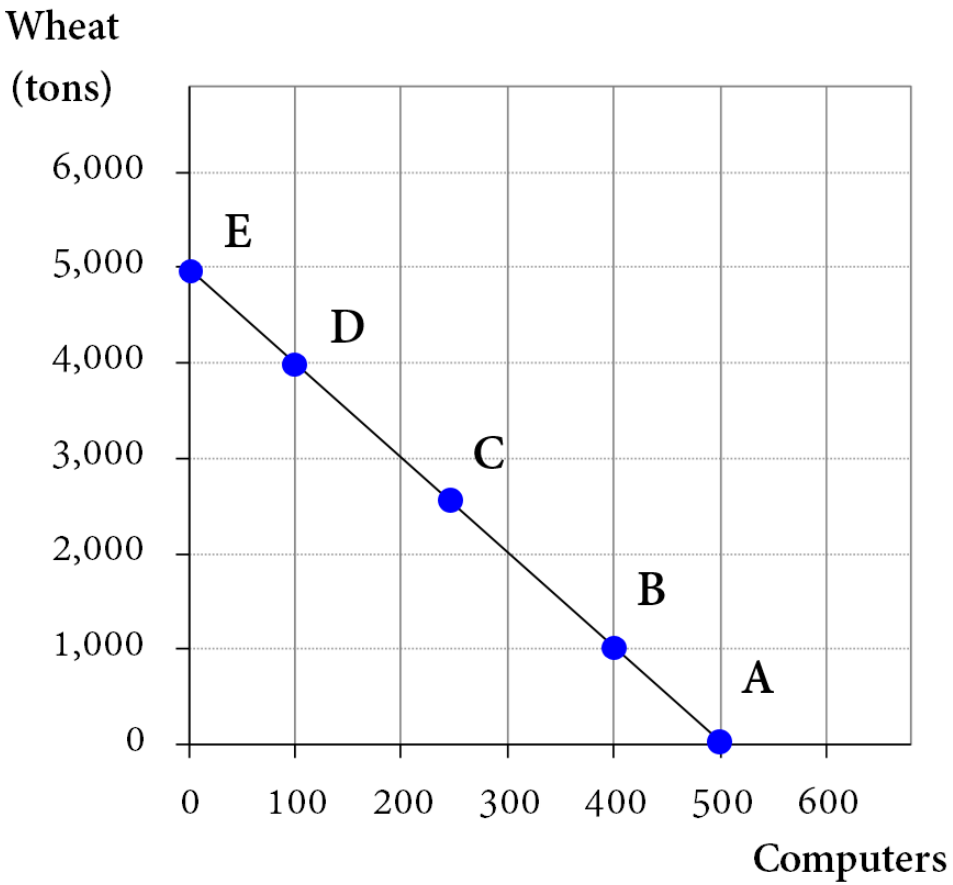
PPF Example

- Producing one computer requires 100 hours labor.
- Producing one ton of wheat requires 10 hours labor.

	Employment of labor hours		Production	
	Computers	Wheat	Computers	Wheat
A	50,000	0	500	0
B	40,000	10,000	400	1,000
C	25,000	25,000	250	2,500
D	10,000	40,000	100	4,000
E	0	50,000	0	5,000

PPF Example

Point on graph	Computers	Wheat
A	500	0
B	400	1,000
C	250	2,500
D	100	4,000
E	0	5,000



What about points off the PPF?

Scan the QR or use link to join

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The PPF: What We Know So Far

- Points on the PPF (like A – E):
  - Possible/attainable
  - Efficient: all resources are fully utilized
- Points under the PPF (like F):
  - Possible/attainable
  - Inefficient: some resources are underutilized (e.g., workers unemployed, factories idle)
- Points above the PPF (like G)
  - Not possible/unattainable

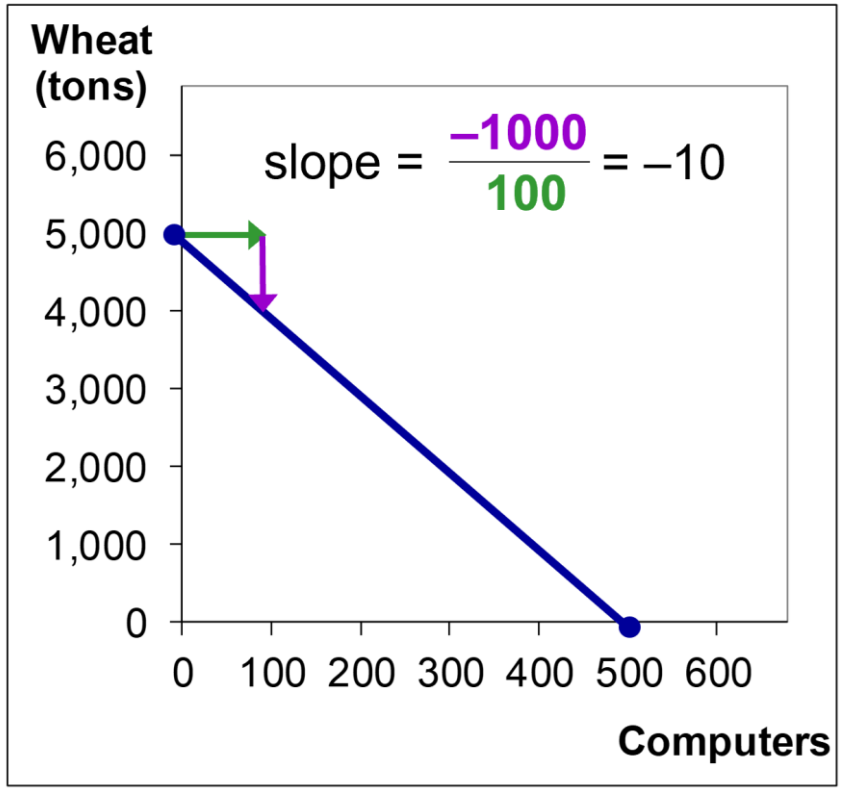
The PPF

- Moving along a PPF
  - Involves shifting resources from the production of one good to the other
- Society faces a tradeoff
  - Getting more of one good requires sacrificing some of the other
- The slope of the PPF
  - The opportunity cost of one good in terms of the other

The PPF and Opportunity Cost

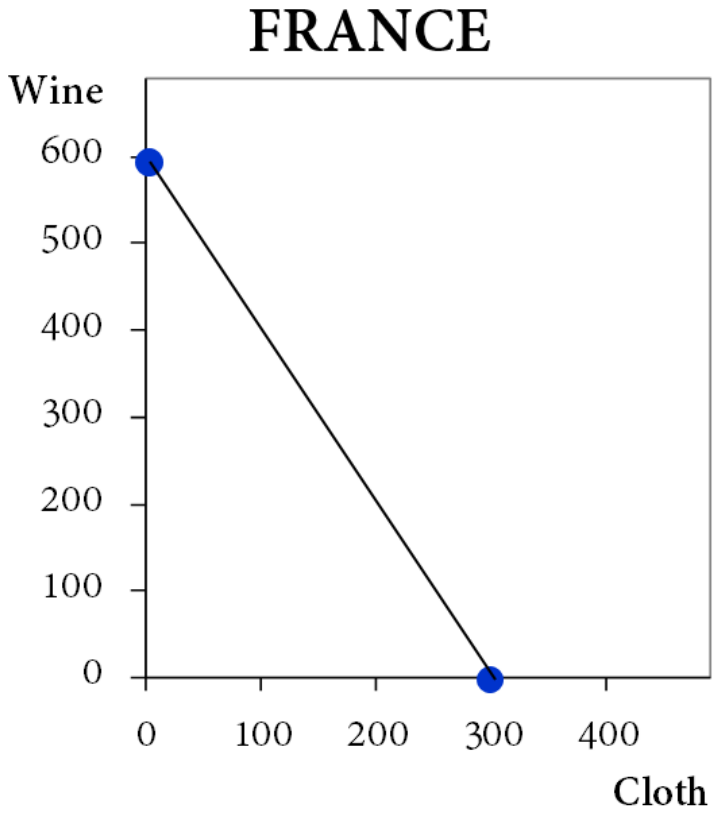
- The slope of a line equals the "**rise** over the **run.**"

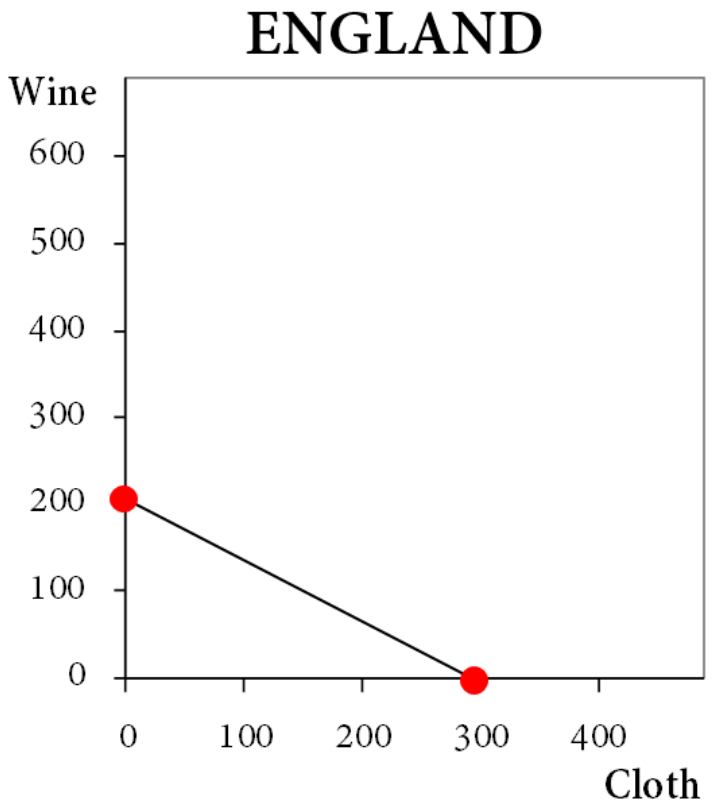
- Opportunity cost of 1 computer = 10 tons of wheat.



Active Learning PPF and Opportunity Cost

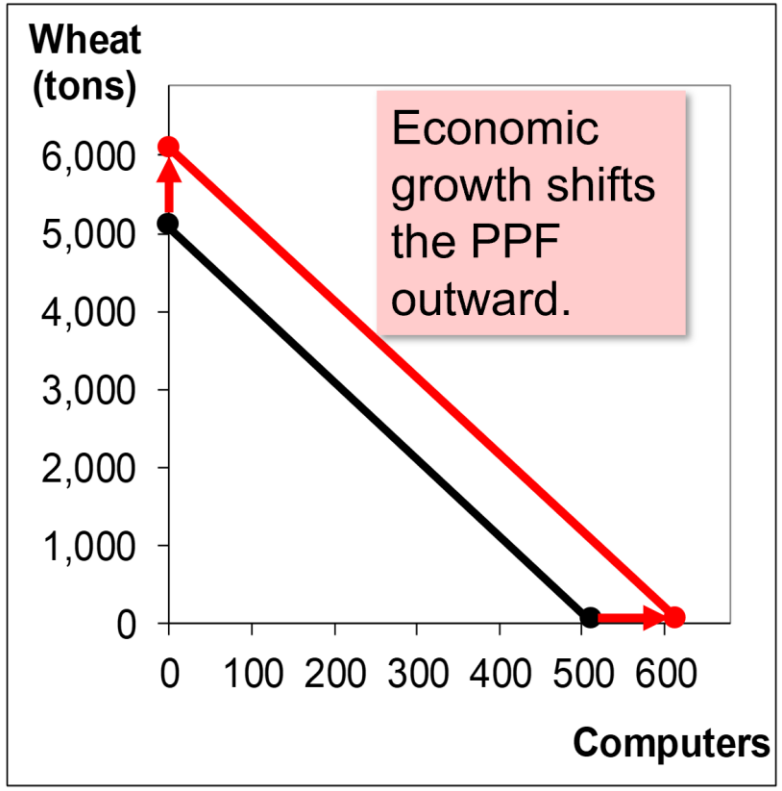
In which country is the opportunity cost of cloth lower?





Economic Growth and the PPF

- With additional resources or an improvement in technology, the economy can produce more computers, more wheat, or any combination in between.



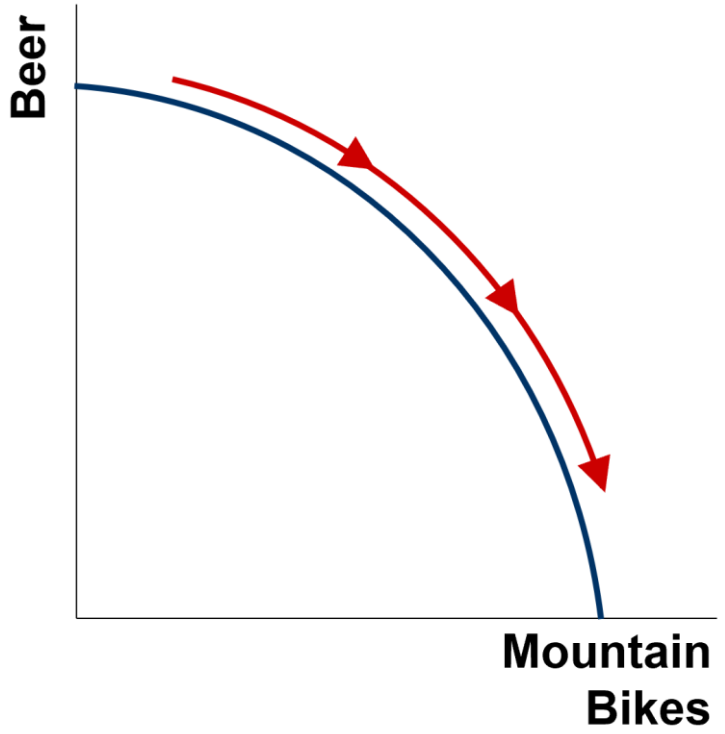
The Shape of the PPF

- The PPF could be a straight line, or bow-shaped
- Depends on what happens to opportunity cost as economy shifts resources from one industry to the other.
  - If opp. cost remains constant, PPF is a straight line. (In the previous example, opp. cost of a computer was always 10 tons of wheat.)
  - If opp. cost of a good rises as the economy produces more of the good, PPF is bow-shaped.

Why the PPF Might Be Bowed Outward

- As the economy shifts resources from beer to mountain bikes:

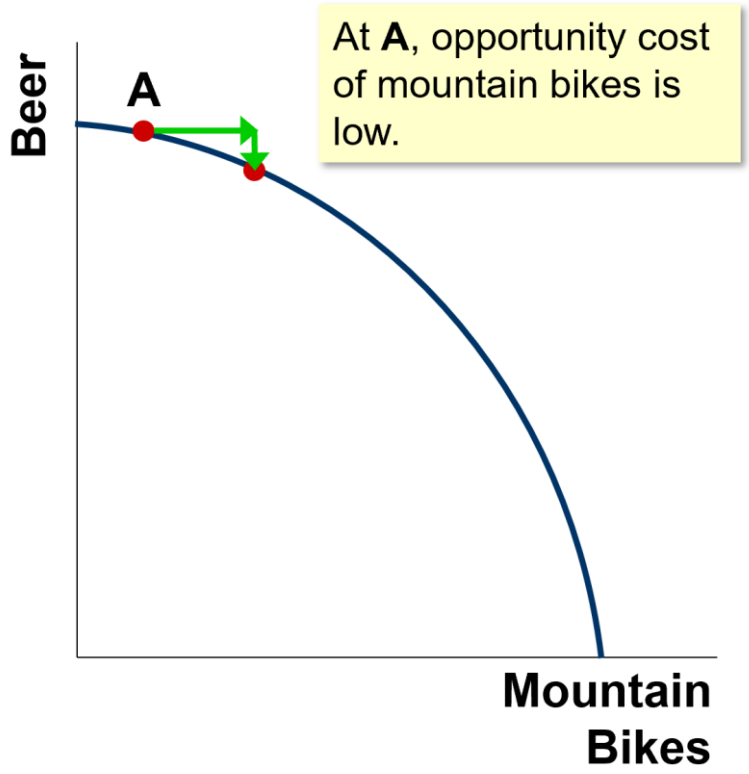
PPF becomes steeper and the opportunity cost of mountain bikes increases.



Why the PPF Might Be Bowed Outward

- At point A, most workers are producing beer, even those who are better suited to building bikes.

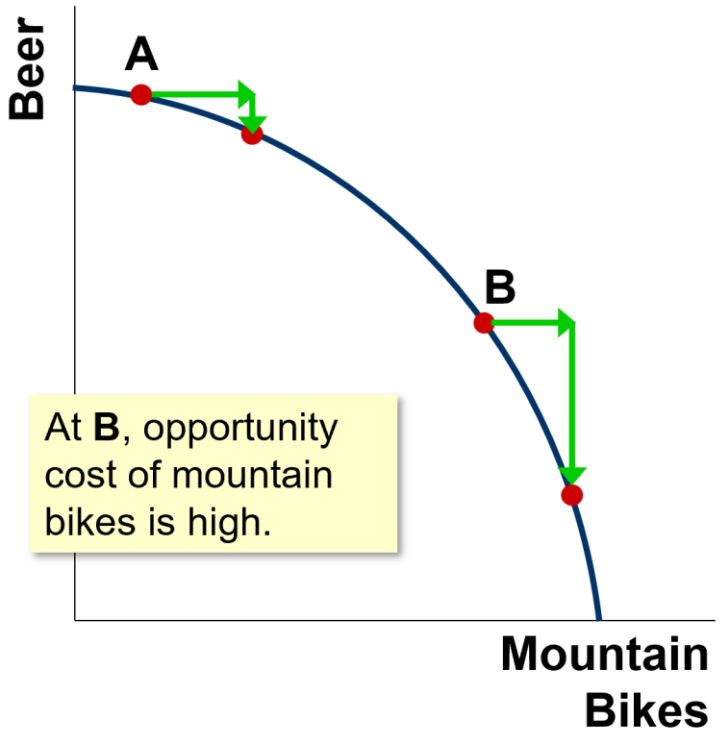
So, do not have to give up much beer to get more bikes.



Why the PPF Might Be Bowed Outward

- At B, most workers are producing bikes. The few left in beer production are the best brewers.

- Producing more bikes would require shifting some of the best brewers away from beer production causing a big drop in beer output.



Why the PPF Might Be Bowed Outward

- The PPF is bowed outward when:
  - Different workers have different skills, different opportunity costs of producing one good in terms of the other
  - There is some other resource, or mix of resources with varying opportunity costs
    - E.g., different types of land suited for different uses

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Trade Can Make Everyone Better Off: Example 1

- Two countries:
  - The U.S. and Japan
- Two goods:
  - Computers and wheat
- One resource:
  - Labor, measured in hours

Internet photo

Internet photo

Trade Can Make Everyone Better Off: Example 1

- 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

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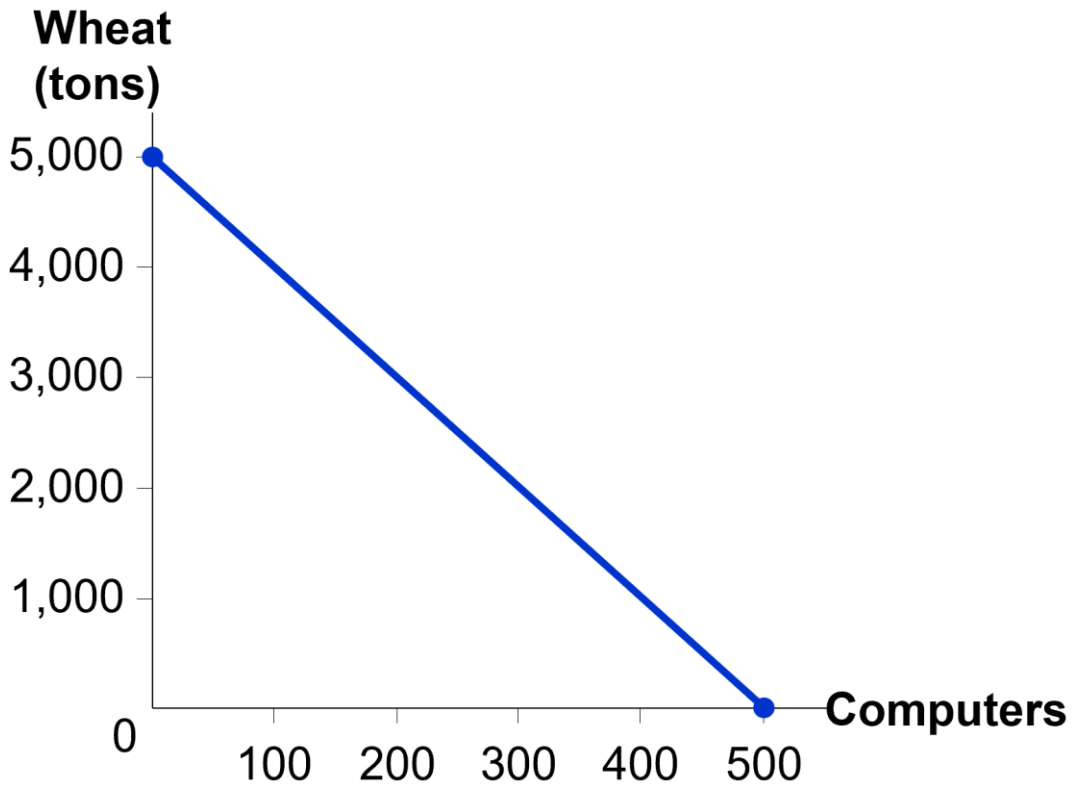
The U.S. PPF

- The U.S. has enough labor to produce 500 computers, or 5,000 tons of wheat, or any combination along the PPF.



Now Try to Derive Japan's PPF Yourself:

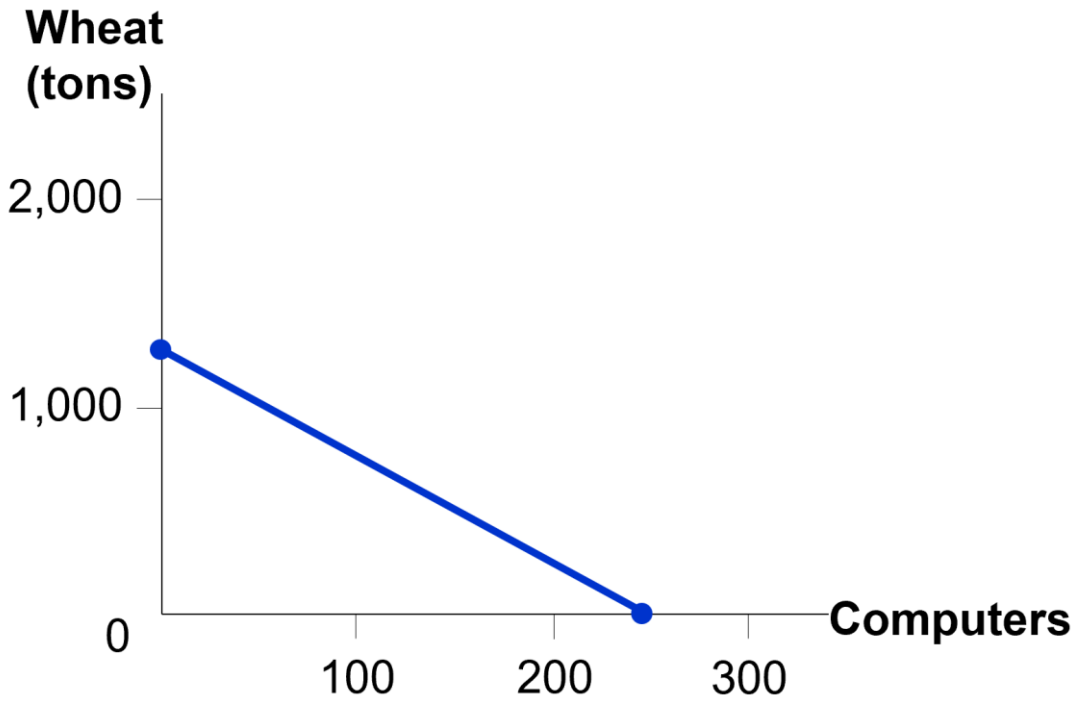
Use the following information to draw Japan's PPF.

- 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.

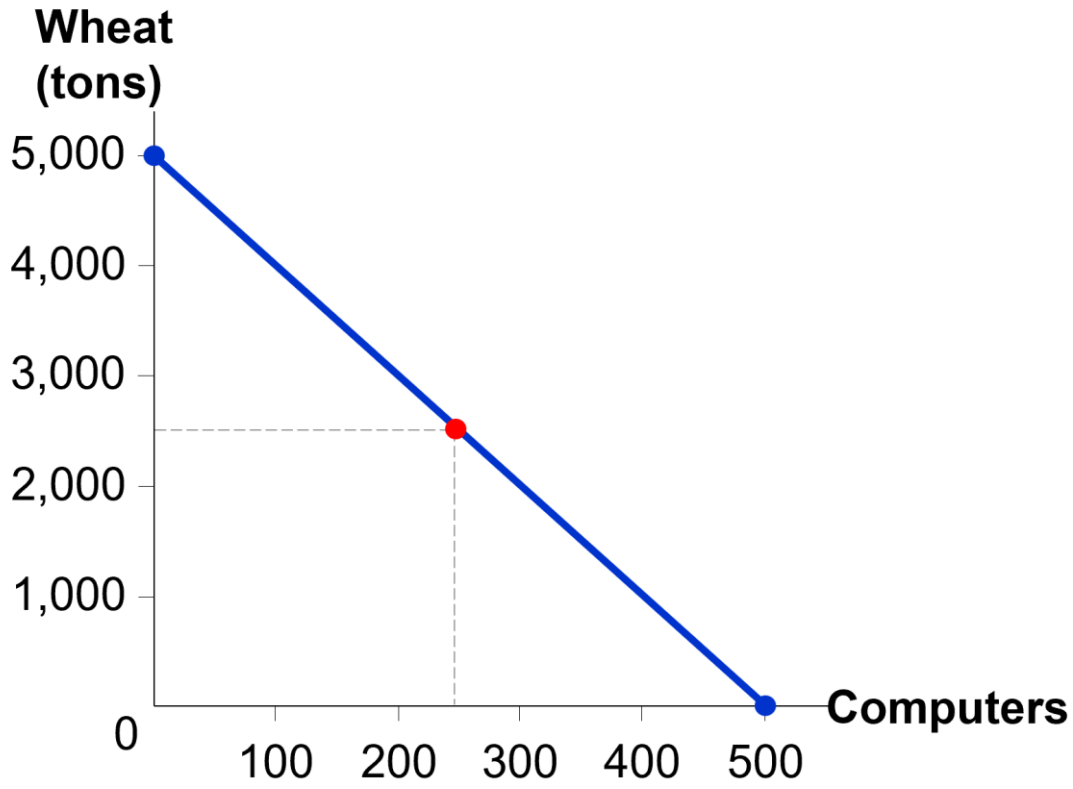
Japan's PPF

- Japan has enough labor to produce 240 computers, or 1,200 tons of wheat, or any combination along the PPF.



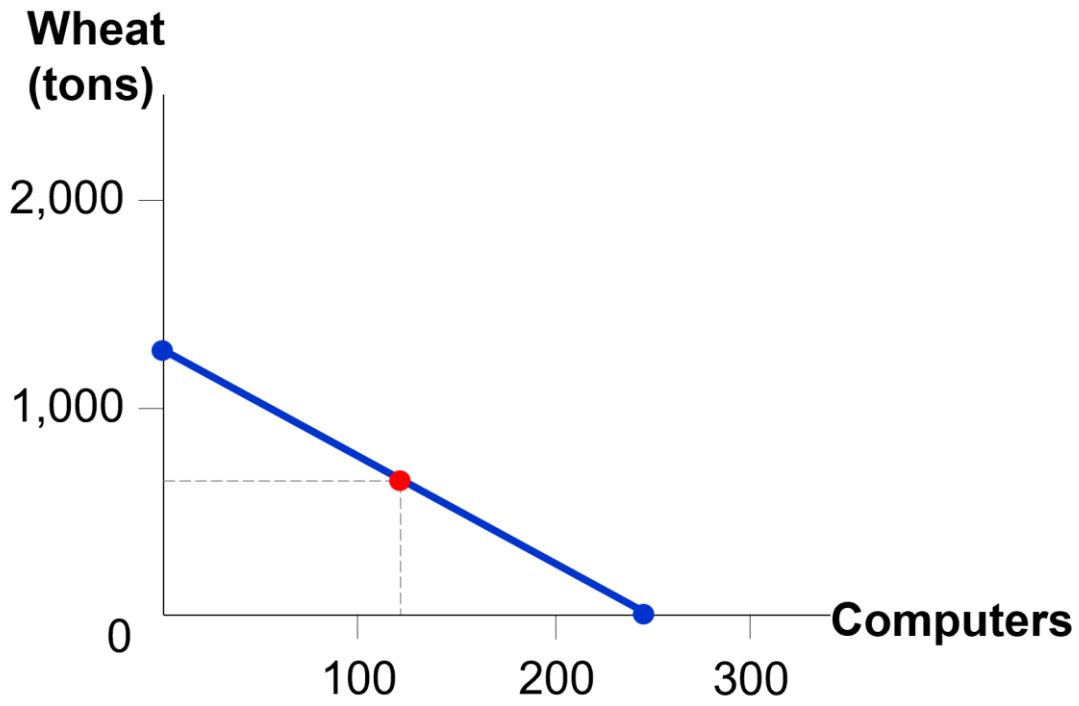
U.S. Without Trade

- Suppose the U.S. uses half its labor to produce each of the two goods. Then it will produce and consume 250 computers and 2,500 tons of wheat.



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.



Absolute Advantage

- Absolute advantage:
  - The ability to produce a good using fewer inputs than another producer
  - The U.S. has absolute advantage in wheat
    - Producing a ton of wheat uses 10 labor hours in the U.S. vs. 25 in Japan
  - The U.S. has absolute advantage in computers
    - Producing one computer requires 125 labor hours in Japan, but only 100 in the U.S.

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Should U.S. Produce Everything by Itself?

- The U.S. has absolute advantage in wheat
- The U.S. has absolute advantage in computers
- So maybe it should produce everything by itself?

Let's See How Trade Can Make Everyone Better Off!

- U.S. proposes that it will produce 3400 tons of wheat and suggest that Japan should spend all its resources to produce computers. Then, they would trade in the following way: U.S. sells 700 tons of wheat to Japan, and buys 110 computers from Japan.
- Do you think this proposal is good for U.S. and/or Japan?

1. Production Under Trade

A. Suppose the U.S. produces 3400 tons of wheat.

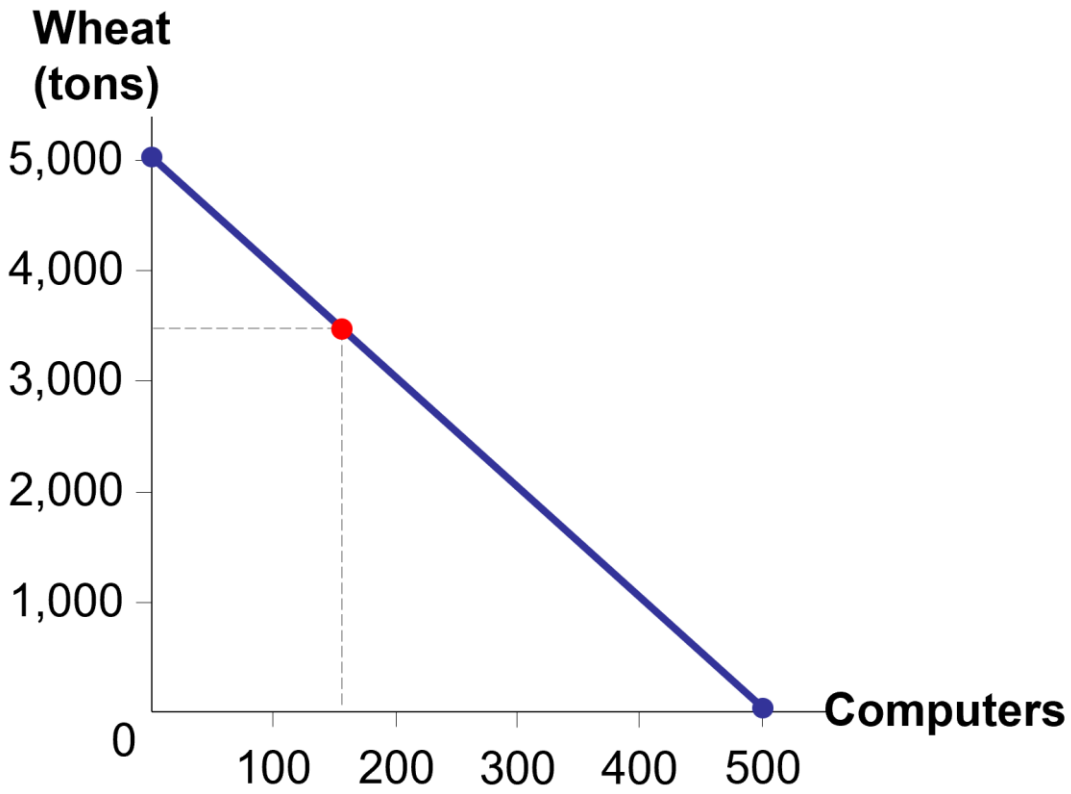
- How many computers would the U.S. be able to produce with its remaining labor?
- Draw the point representing this combination of computers and wheat on the U.S. PPF.

B. 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.

1.1. U.S. Production Under Trade

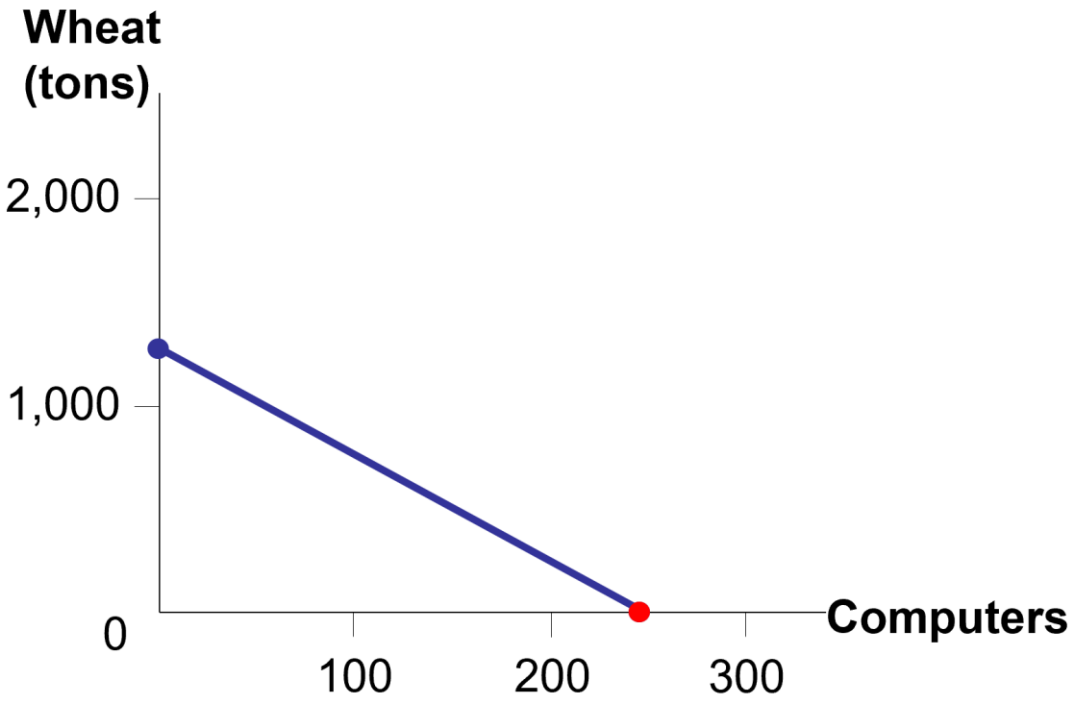
- Producing 3,400 tons of wheat requires 34,000 labor hours.
- The remaining 16,000 labor hours are used to produce 160 computers.



1.2. Japan Production Under Trade

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

- So, Japan would produce 0 tons of wheat.



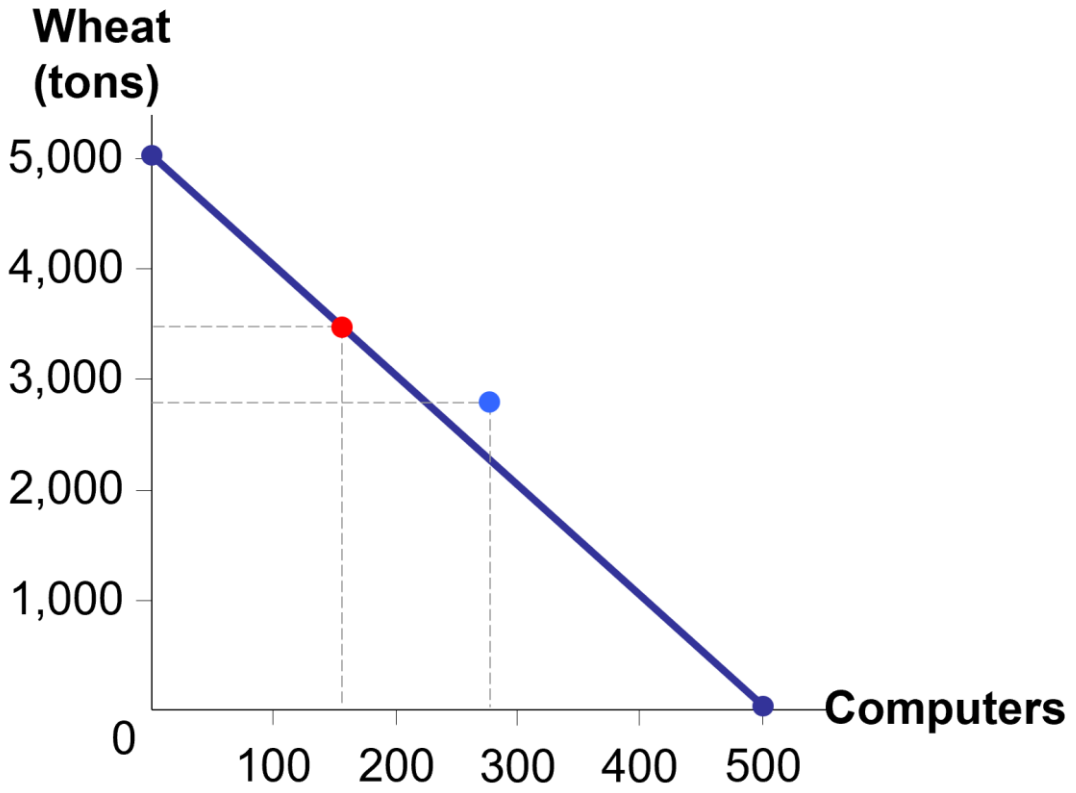
Then They Trade According to the Deal:

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

- Imports
  - Goods produced abroad and sold domestically
- Exports
  - Goods produced domestically and sold abroad

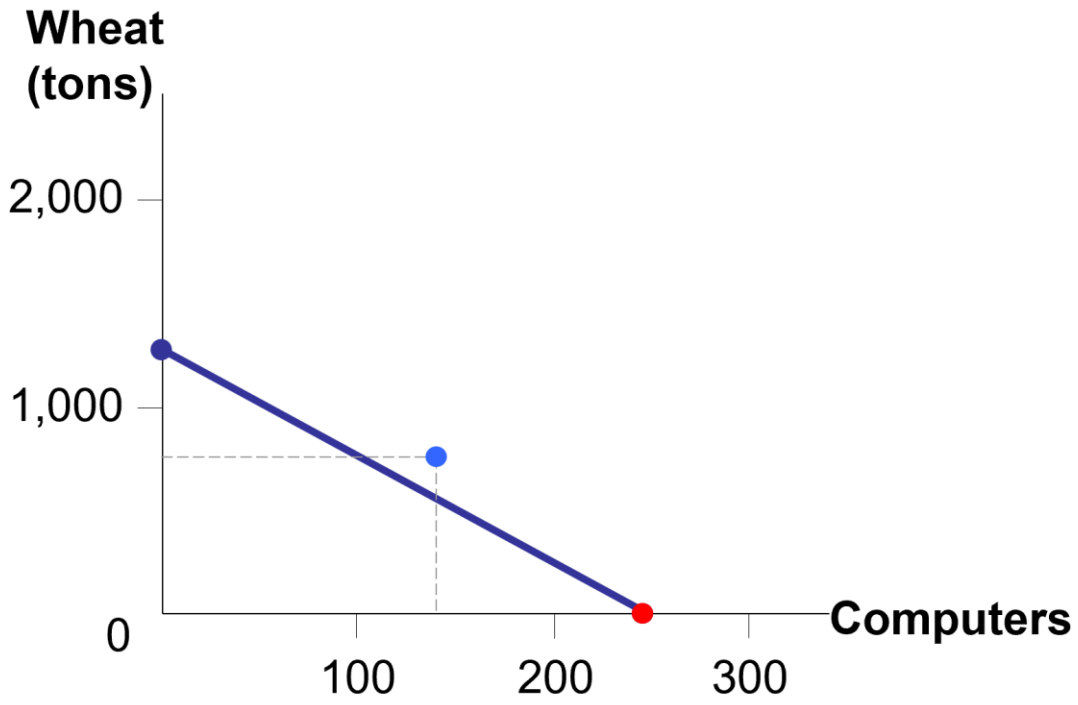
1.3. U.S. Consumption With Trade

	Computers	Wheat
Produced	160	3,400
+ Imported	110	0
– Exported	0	700
= Amount Consumed	270	2,700



1.4. 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.		Japan	
	Computers	Wheat	Computers	Wheat
Without trade:				
Production and Consumption	250	2500	120	600
With trade:				
Production	160	3400	240	0
Trade	Gets 110	Gives 700	Gives 110	Gets 700
Consumption	270	2700	130	700
Gains from trade:				
Increase in consumption	+20	+200	+10	+100

Where Do These Gains Come From?

- The U.S. has an absolute advantage in both goods!
  - So why does Japan specialize in computers?
  - Why do both countries gain from trade?
- Two countries can gain from trade
  - When each specializes in the good it produces at lowest cost

Internet photo

Two Measures of the Cost of a Good

- Absolute advantage
  - Measures the cost of a good in terms of the inputs required to produce it
- Another measure of cost: 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.

Internet photo

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 opp. cost of a computer in each country.

Internet photo

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
  - Japan has comparative advantage in computers (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 the example coming next) specializing in different goods and trading with each other.

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Sherlock Holmes & Dr. Watson on the Dartmoor Farm

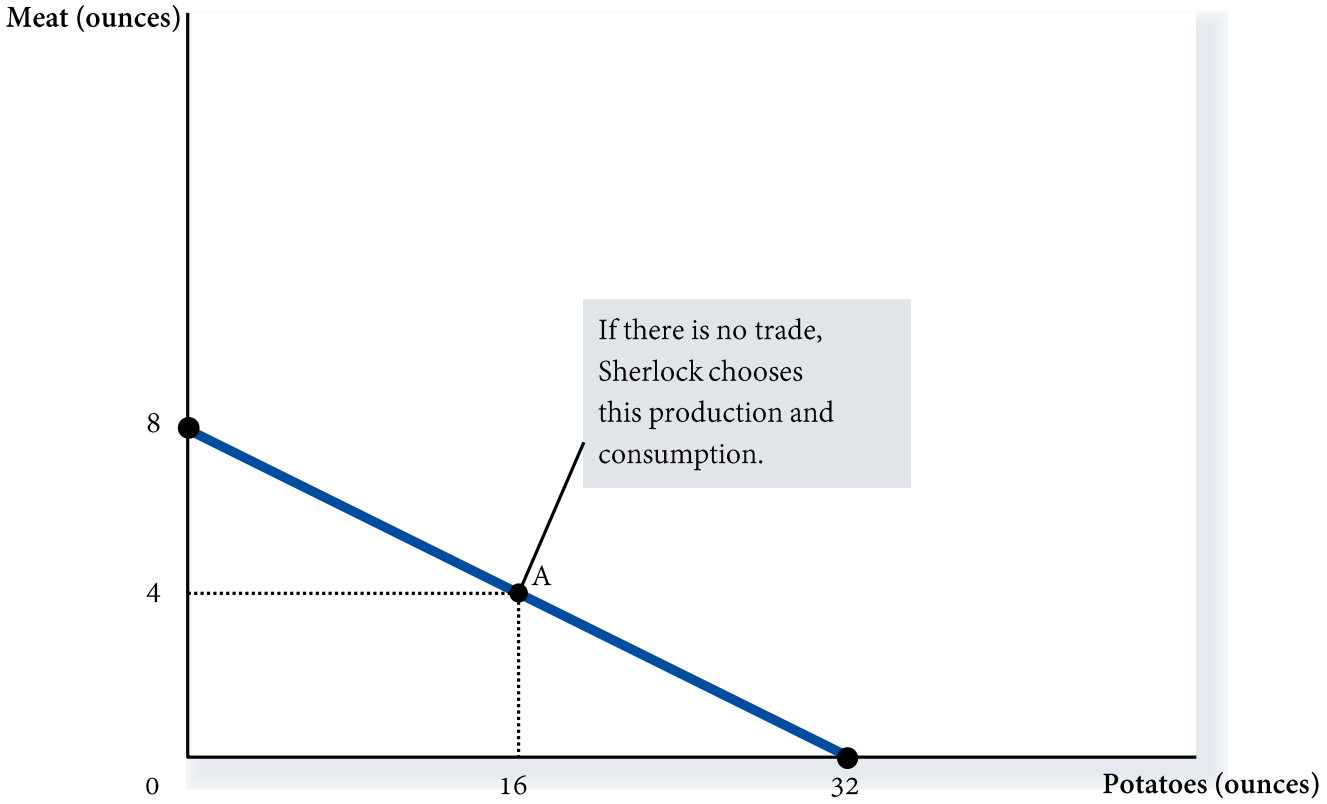
- It started as just another case…
- A tricky case leads Sherlock Holmes and Dr. Watson deep into Dartmoor in winter.
  - No trains. No deliveries. No Mrs. Hudson.
- To survive the winter, they must produce and consume **two goods**:
  - **Potatoes** – filling, long-lasting food
  - **Meat** – protein for strength

Source: https://pixabay.com/vectors/detective-searching-man-search-1424831/

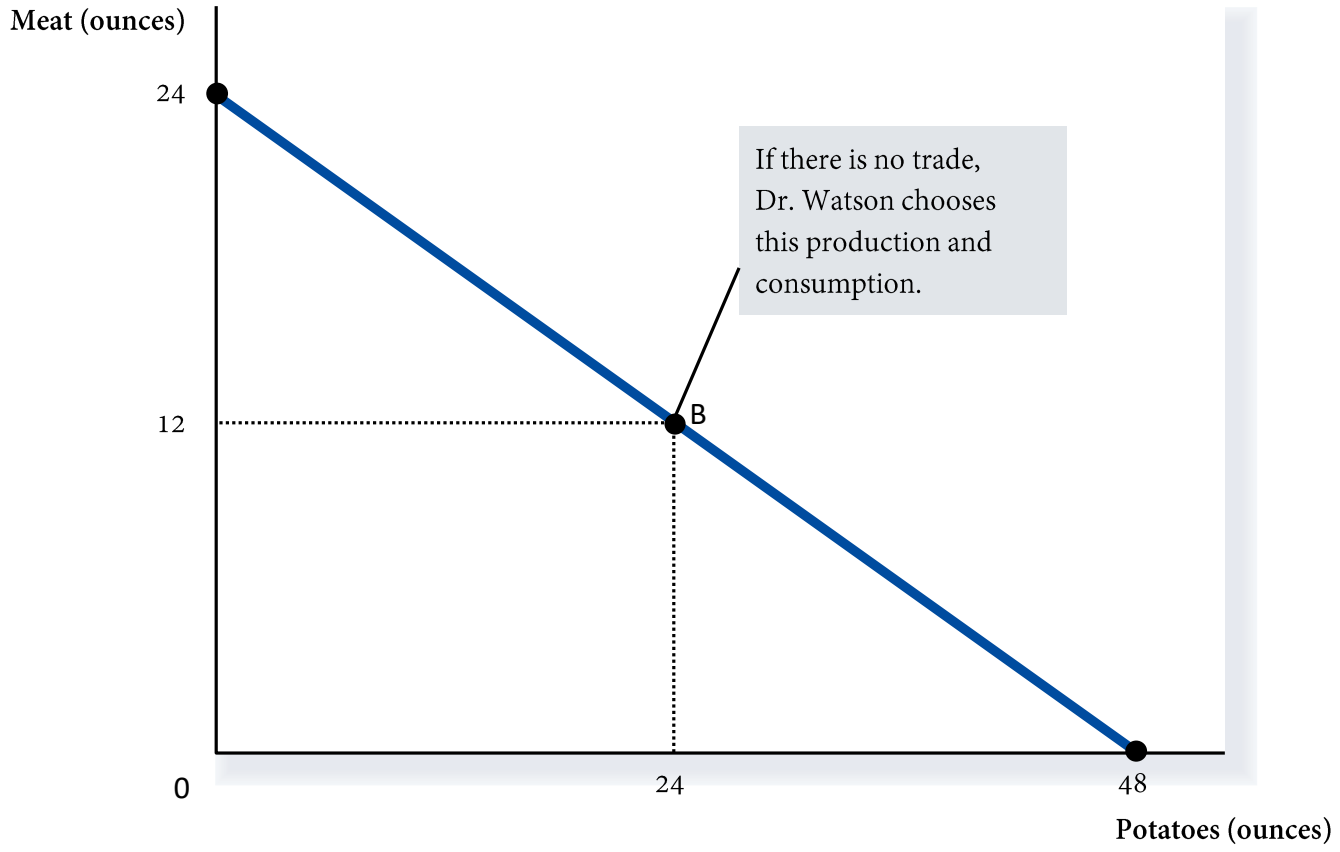
Different skills, different speeds

- Sherlock Holmes
  - Obsession with details, precision
- Dr. John Watson
  - Formerly an army doctor
  - Strong, fast, and practical.

Sherlock's Production Possibilities Frontier



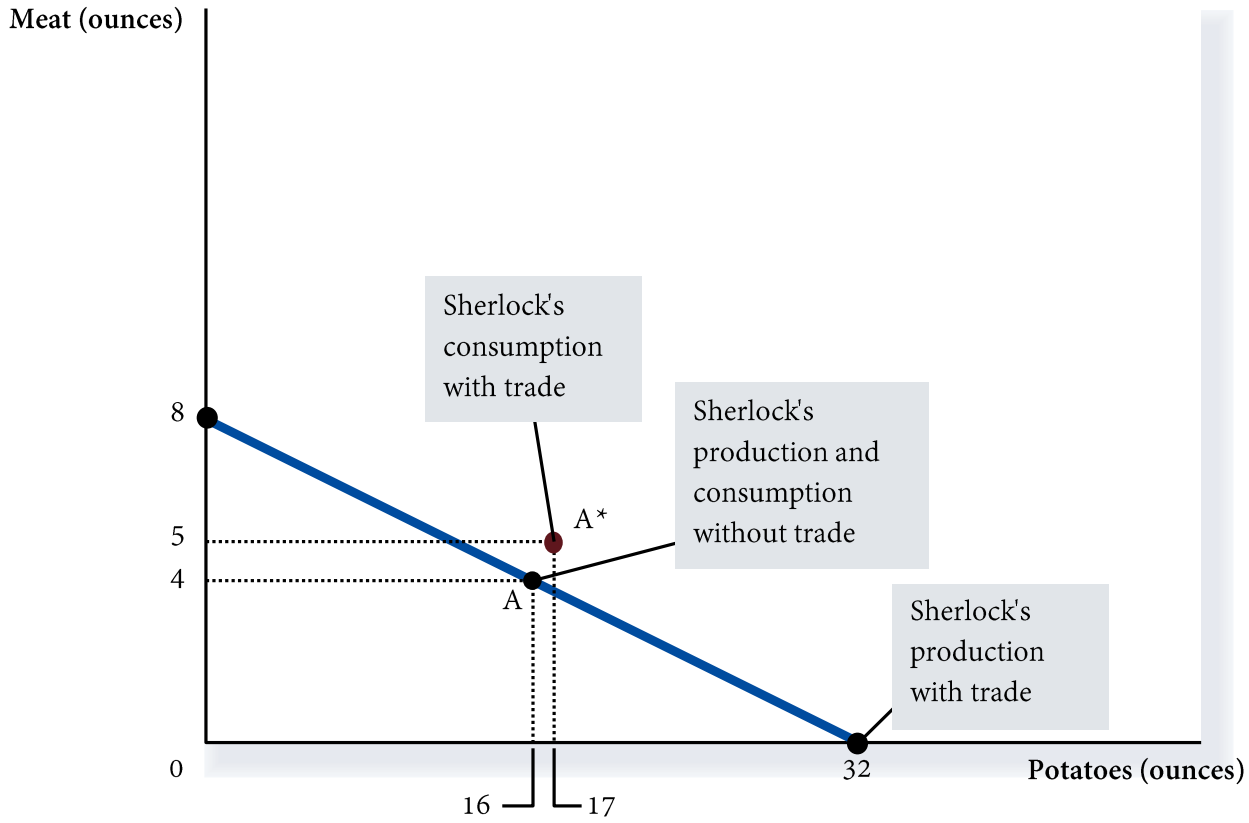
Dr. Watson's Production Possibilities Frontier



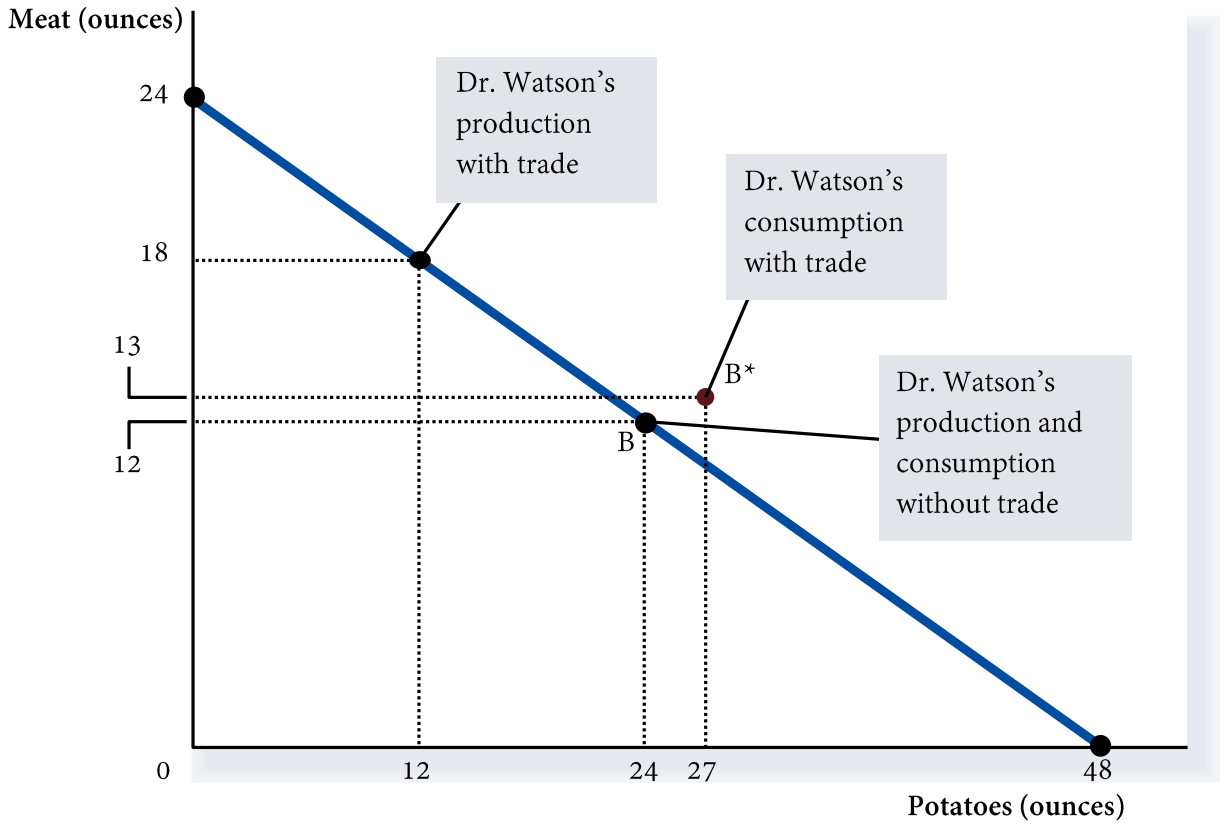
Specialization and Trade

- Can they be better off if they specialize in what they are relatively good at?

Sherlock's Production and Consumption



Dr. Watson's Production and Consumption



Trade Makes Both Better Off: A Summary

	Sherlock Holmes		Dr. Watson	
	Meat	Potatoes	Meat	Potatoes
Without Trade:				
Production and Consumption	4 oz	16 oz	12 oz	24 oz
With Trade:				
Production	0 oz	32 oz	18 oz	12 oz
Trade	Gets 5 oz	Gives 15 oz	Gives 5 oz	Gets 15 oz
Consumption	5 oz	17 oz	13 oz	27 oz
Gains from Trade:				
Increase in Consumption	+1 oz	+1 oz	+1 oz	+3 oz

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Trade & The Better Life

- Planet Money is an American podcast and blog produced by NPR. Years ago, they decided to make some Planet Money T-shirts. Of course, those T shirts are not made in the U.S., they are made in Colombia and Bangladesh instead.
- Question: is it a surprise to you that the T-shirts are not made in the U.S.? Why?

- Sources: NPR Planet Money Summer School 6: Trade & The Better Life
- Link: https://www.npr.org/transcripts/1118017763

Internet photo

More Questions

- Do you think Bangladesh is the most productive in making men's T-shirts? If not, why are those T-shirts made in Bangladesh instead of other places?
- How do trade and specialization benefit both Colombia and Bangladesh?
- Are some subgroups hurt during this process?

Let's do some practices together!

Scan the QR or use link to join

https://forms.office.com/r/C94sbzqDr4?origin=lprLink

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.

Can You Answer the Following 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?

End