

N. GREGORY

MANKIW

PRINCIPLES OF

ECONOMICS

Eight Edition



CHAPTER

3

Interdependence and the Gains from Trade

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A Parable for the Modern Economy

- Only two goods
 - Meat
 - Potatoes
- Only two people
 - A cattle rancher named Ruby
 - A potato farmer named Frank
 - Both would like to eat both meat and potatoes



A Parable for the Modern Economy, Part 1

- If Ruby produces only meat and Frank produces only potatoes
 - Both gain from trade
- If both Ruby and Frank produce both meat and potatoes
 - Both gain from specialization and trade
- Production possibilities frontier
 - Various mixes of output that an economy can produce

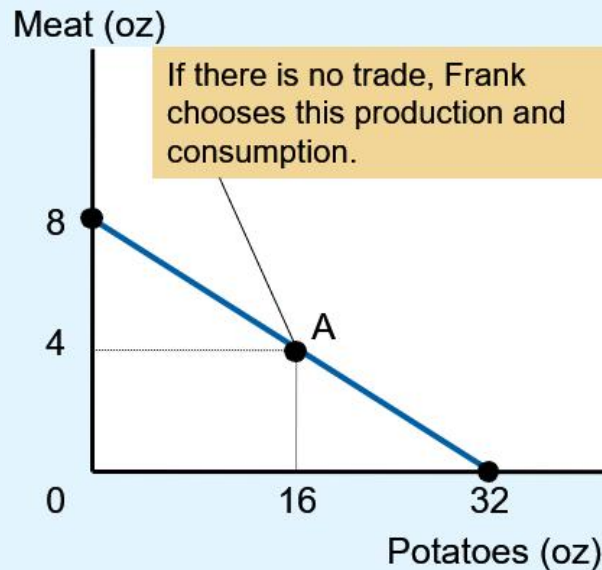
Figure 1 The Production Possibilities Frontier (a)

	Minutes needed to make 1 ounce of meat	Minutes needed to make 1 ounce of potatoes	Amount of meat produced in 8 hours	Amount of potatoes produced in 8 hours
Frank the farmer	60 minutes per ounce	15 minutes per ounce	8 ounces	32 ounces
Ruby the rancher	20 minutes per ounce	10 minutes per ounce	24 ounces	48 ounces

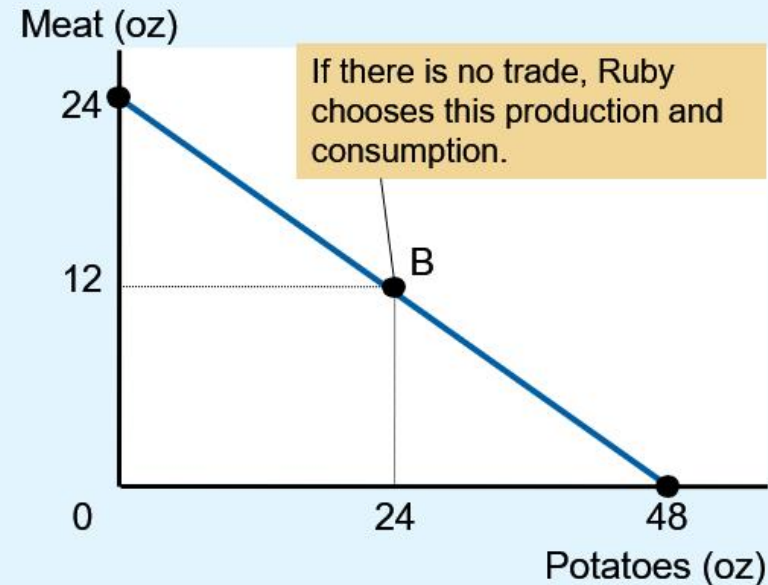
Panel (a) shows the production opportunities available to Frank the farmer and Ruby the rancher.

Figure 1 The Production Possibilities Frontier (b, c)

(b) Frank's production possibilities frontier



(c) Ruby's production possibilities frontier



Panel (b) shows the combinations of meat and potatoes that Frank can produce. Panel (c) shows the combinations of meat and potatoes that Ruby can produce. Both production possibilities frontiers are derived assuming that Frank and Ruby each work 8 hours per day. If there is no trade, each person's production possibilities frontier is also his or her consumption possibilities frontier.

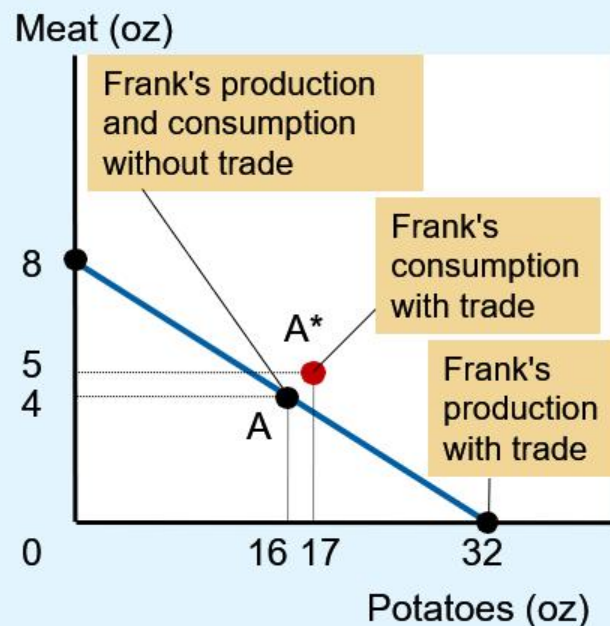


A Parable for the Modern Economy, Part 2

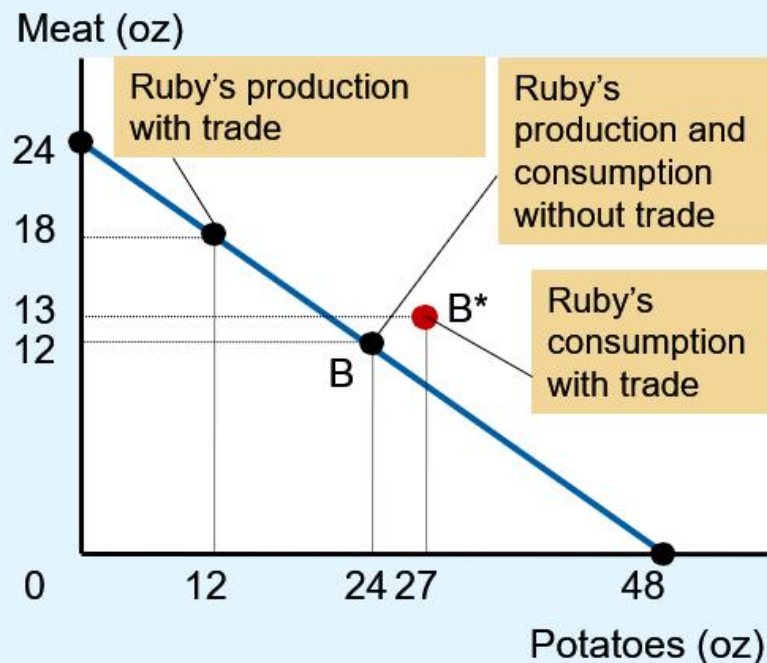
- Specialization and trade
 - Farmer Frank specializes in growing potatoes
 - More time growing potatoes
 - Less time raising cattle
 - Rancher Ruby specializes in raising cattle
 - More time raising cattle
 - Less time growing potatoes
 - Trade: 5 oz of meat for 15 oz of potatoes

Figure 2 How Trade Expands the Set of Consumption Opportunities (a,b)

(a) Frank's production and consumption



(b) Ruby's production and consumption



The proposed trade between Frank the farmer and Ruby the rancher offers each of them a combination of meat and potatoes that would be impossible in the absence of trade.

In panel (a), Frank gets to consume at point A* rather than point A.

In panel (b), Ruby gets to consume at point B* rather than point B. Trade allows each to consume more meat and more potatoes.

Figure 2 How Trade Expands the Set of Consumption Opportunities (c)

	Frank's meat	Frank's potatoes	Ruby's meat	Ruby's potatoes
Production and consumption without trade	4 ounces	16 ounces	12 ounces	24 ounces
Production with trade	0 ounce	32 ounces	18 ounces	12 ounces
Trade	Gets 5 ounces	Gives 15 ounces	Gives 5 ounces	Gets 15 ounces
Consumption with trade	5 ounces	17 ounces	13 ounces	27 ounces
Increase in consumption with gains from trade	Increase of 1 ounce	Increase of 1 ounce	Increase of 1 ounce	Increase of 3 ounces



Comparative Advantage, Part 1

- Absolute advantage
 - The ability to produce a good using fewer inputs than another producer
 - In producing meat: Ruby
 - Ruby needs 20 min. to produce 1 oz of meat
 - Frank needs 60 minutes
 - In producing potatoes: Ruby
 - Ruby needs 10 min. to produce 1 oz of potatoes
 - Frank needs 15 minutes



Comparative Advantage, Part 2

- Opportunity cost
 - Whatever must be given up to obtain some item
 - Measures the trade-off between the two goods that each producer faces



Comparative Advantage, Part 3

- Opportunity cost

- Frank: 60 min. to produce 1 oz meat, and 15 min. to produce 1 oz potatoes
 - To produce 1 more oz meat, give up 4 oz potatoes
 - To produce 1 more oz potatoes, give up $\frac{1}{4}$ oz meat
- Ruby: 20 min. to produce 1 oz meat, and 10 min. to produce 1 oz potatoes
 - To produce 1 more oz meat, give up 2 oz potatoes
 - To produce 1 more oz potatoes, give up $\frac{1}{2}$ oz meat

Table 1 The Opportunity Cost of Meat and Potatoes

	Opportunity cost of 1 ounce of meat	Opportunity cost of 1 ounce of potatoes
Frank the farmer	4 ounces of potatoes	One-quarter ounce of meat
Ruby the rancher	2 ounces of potatoes	One-half ounce of meat



Comparative Advantage, Part 4

- **Comparative advantage**
 - The ability to produce a good at a lower opportunity cost than another producer
 - Reflects the relative opportunity cost
- **Principle of comparative advantage**
 - Each good should be produced by the individual that has the smaller opportunity cost of producing that good
 - Specialize according to comparative advantage



Comparative Advantage, Part 5

- One person
 - Can have absolute advantage in both goods
 - Cannot have comparative advantage in both goods
- For different opportunity costs
 - One person has comparative advantage in one good
 - The other person has comparative advantage in the other good



Comparative Advantage, Part 6

- Opportunity cost of one good
 - Inverse of the opportunity cost of the other
- Gains from specialization and trade
 - Based on comparative advantage
 - Total production in economy rises
 - Increase in the size of the economic pie
 - Everyone is better off



Comparative Advantage, Part 7

- Trade can benefit everyone in society
 - Allows people to specialize in activities in which they have a comparative advantage
- The price of trade
 - Must lie between the two opportunity costs
- The principle of comparative advantage explains:
 - Interdependence
 - Gains from trade



Applications of Comparative Advantage

Should Serena Williams Mow Her Own Lawn?

- Serena, in 2 hours
 - Mow her lawn, or
 - Film a TV commercial, earn \$30,000
- Forest Gump, in 4 hours
 - Mow Serena's lawn
 - Work at McDonald's, earn \$50



"They did a nice job with this grass."



Applications of Comparative Advantage, Part 1

Should the U.S. trade with other countries?

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



Applications of Comparative Advantage, Part 2

Should the U.S. trade with other countries?

- U.S and Japan
 - Each produces food and cars
 - One American worker, in one month, can produce
 - One car or 2 tons of food
 - One Japanese worker, in one month, can produce
 - One car or 1 ton of food



Applications of Comparative Advantage, Part 3

- Principle of comparative advantage
 - Each good should be produced by the country with the smaller opportunity cost of producing that good
- Opportunity cost of a car
 - Is 2 tons of food in the United States
 - But only 1 ton of food in Japan
- Japan has a comparative advantage in producing cars



Applications of Comparative Advantage, Part 4

- Opportunity cost of a ton of food
 - Is 1 car in Japan
 - But only $\frac{1}{2}$ car in the United States
- The United States has a comparative advantage in producing food
- Specialization and trade
 - All countries have more food and more cars

ASK THE EXPERTS, Part 1

Trade between China and the United States


“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.”

What do economists say?

0% disagree

0% uncertain

100% agree



ASK THE EXPERTS, Part 2

Trade between China and the United States

“Some Americans who work in the production of competing goods, such as clothing and furniture, are made worse off by trade with China.”

