

Chapter 2

Economic Models: Tradeoffs and Trade

Models: Simplified representations of reality

Models graphically illustrate the relationship between two economic variables (all other variables are held *constant*).

This is called the *all other things equal* assumption or *ceteris paribus*.

E.g. What happens if the price of a good changes?

- We can predict that the quantity purchased will change, but we have to control for other variables, such as: income, preferences, availability of other products.



Three Models

生产可能性曲线

1. The Production Possibility Frontier (PPF)

- Illustrates the quantity of production that is possible in an economy or a person
 - Resources can only be spent **making one good or another.**
 - E.g. baking cookies or a cake
 - And because resources are scarce, we must make tradeoffs in production
- E.g. With one set of inputs we can bake cookies or a cake, but not both.



Building a Production Possibilities Model

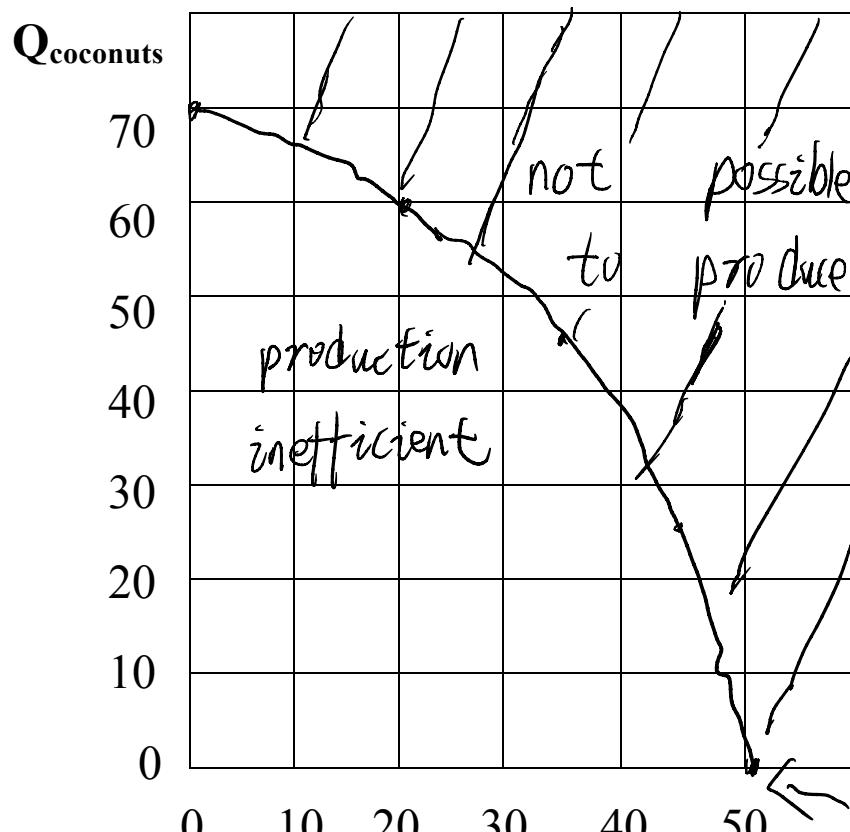
Assume an economy only produces two goods, coconuts and fish.



- Scarce resources are: time, materials, and land

The model will show the maximum number of coconut and fish that could be gathered if all resources are devoted to producing one or the other.

The model will also show all possible combinations of coconuts and fish that could be gathered when all resources are used.



Coconuts	Fish
70	0
60	20
45	35
25	45
0	50

The society works in the maximum efficient to produce

PPF = all possible combinations of goods that can be produced assuming that : 1. All resources are used, 2. Technology and resources are fixed

- Points outside the PPF are not possible because there are not enough resources.
- Points inside the curve are *inefficient* because more of one good could be produced without reducing production of the other good.
- Points that form the curve are *efficient* because more of one good can *only* be produced by producing less of the other good.
- The amount of one good that has to be given up to make more of the other is the opportunity cost of additional production.

Examples:

If the above economy is producing 45 coconuts and 35 fish, the opportunity cost of producing 15 more coconuts is 15 fish, or 1c/t

If the above economy is producing 25 coconuts and 45 fish, the opportunity cost of producing 5 more fish is

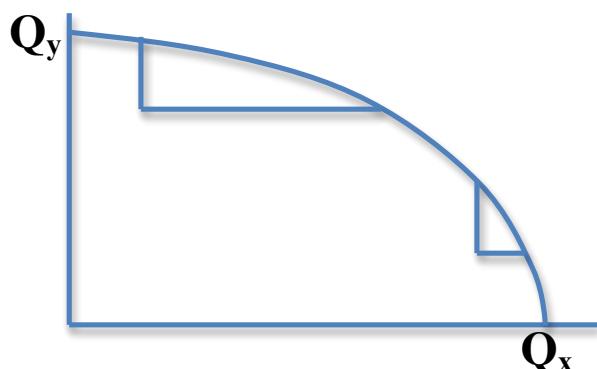
25 coconuts, or 5c/t

$$\text{Opportunity cost} = \frac{\Delta \text{lost}}{\Delta \text{gained}}$$

Coconuts	Fish	Opportunity Cost per Fish	Opportunity Cost per Coconut
70	0		
-10	+20	$\frac{1}{2}$ coconuts	2 fish
60	20		
-15	+15	1 coconut	1 fish
45	35		
-20	+10	2 coconuts	$\frac{1}{2}$ fish
25	45		
-25	+5	5 coconuts	$\frac{1}{5}$ fish
0	50		

Opportunity costs of production generally increase as quantity produced increases. Why??

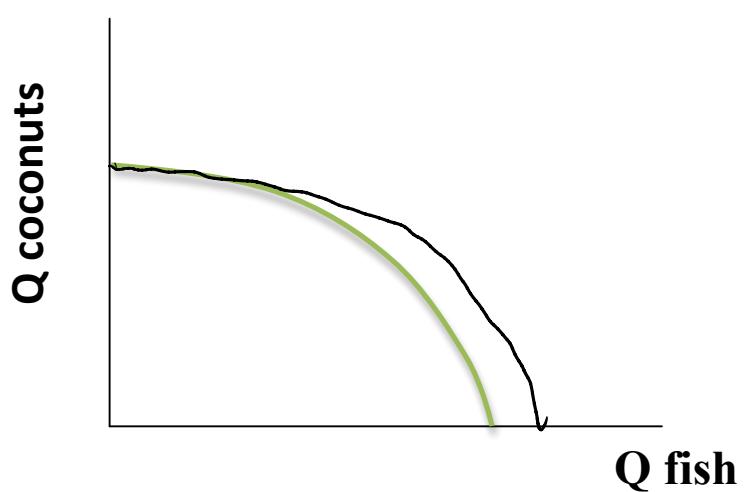
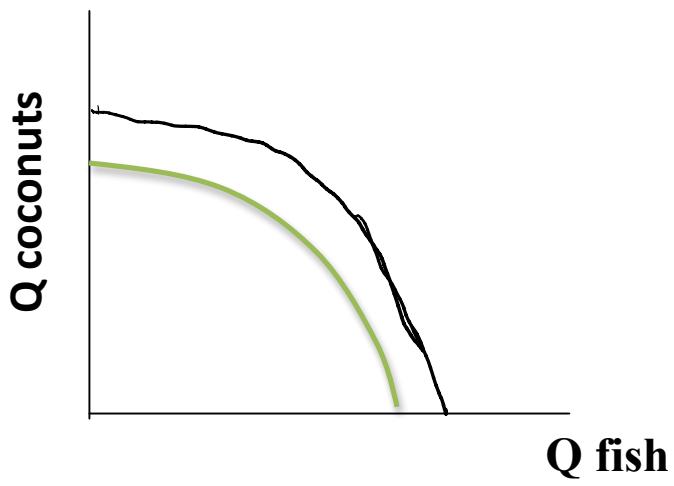
- Because if only a small amount of a good is produced, the most productive resources are used → fewer resources are needed → smaller opportunity cost
- As more and more of the good is produced, resources that are less productive have to be used → more resources are needed → large opportunity cost
- The opportunity cost is the increasing slope of the PPF
- Therefore, the PPF is always concave to the origin



Economies grow when the PPF expands, which can happen when an economy either acquires more resources or develops better technology.

Tom finds a stick: This will increase his ability to get more of both goods
→ the PPF shifts out.

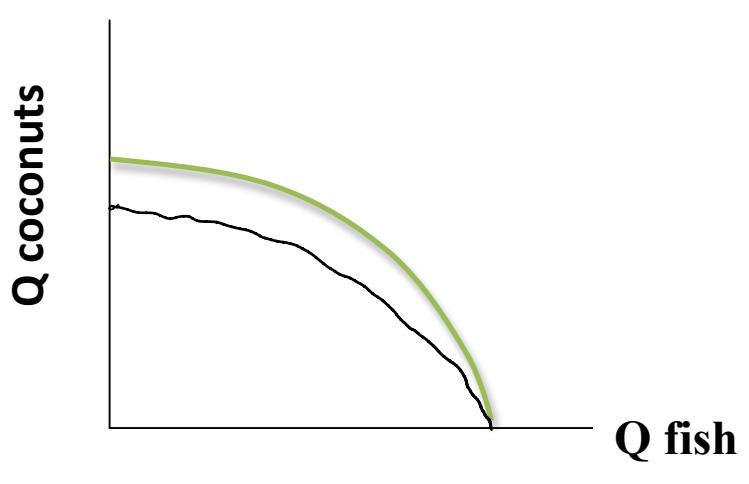
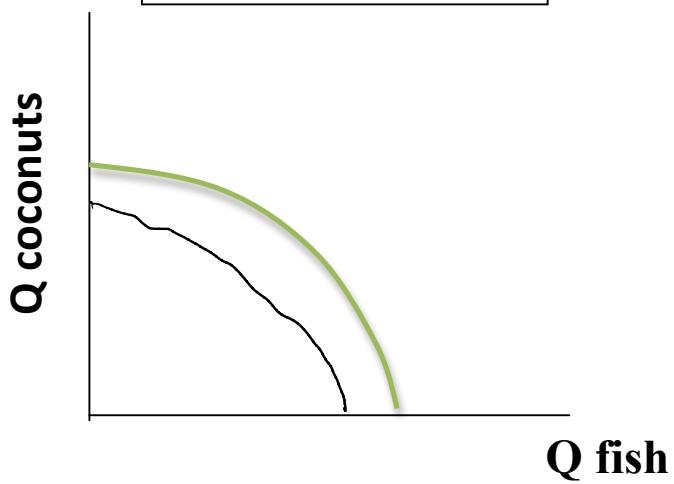
Tom finds a new fishing pond: This will allow him to get more fish only → the PPF rotates out along the fish axis.



Economies can shrink if there is decrease in resources

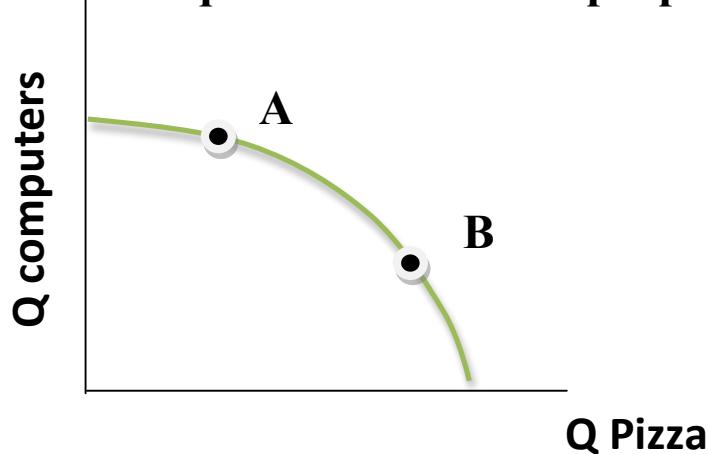
Tom gets sick and cannot work as much as usual.

Some coconut trees blow over in a hurricane.



Efficiency

- Productive efficiency is any point along the PPF
- Consumption efficiency is when the point of production is equal to the amount people most want to consume



Points B and A are both productively efficient → if consumers prefer B, then only B is consumption efficient

2. Comparative Advantage and Gains from Trade

Gains from trade occur when people specialize and trade, and can thereby consume more than they can produce.



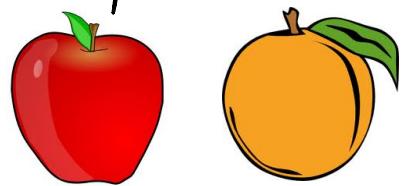
Gains are maximized when producers specialize based on comparative advantage.

Comparative Advantage = when someone can produce a good with a lower opportunity cost than someone else.

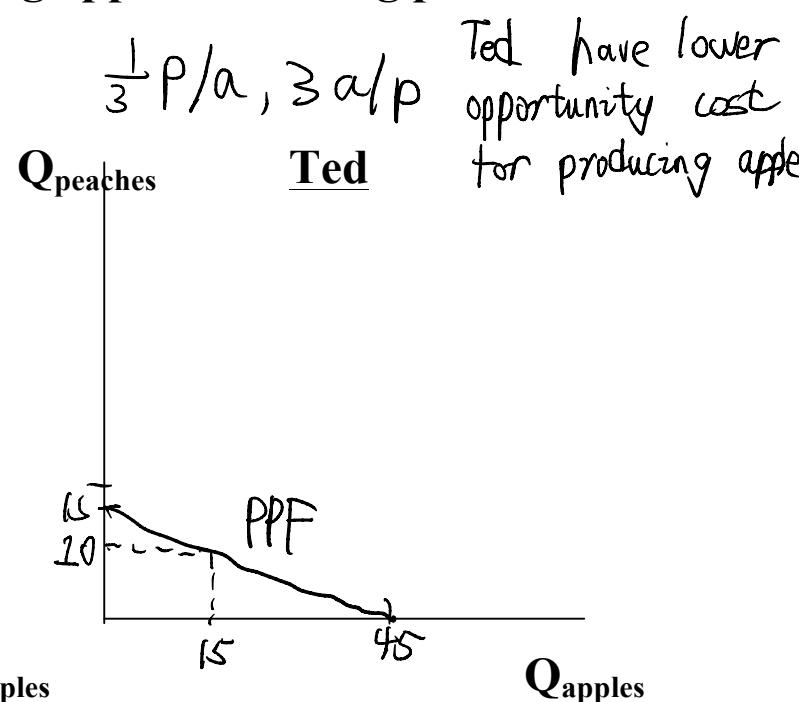
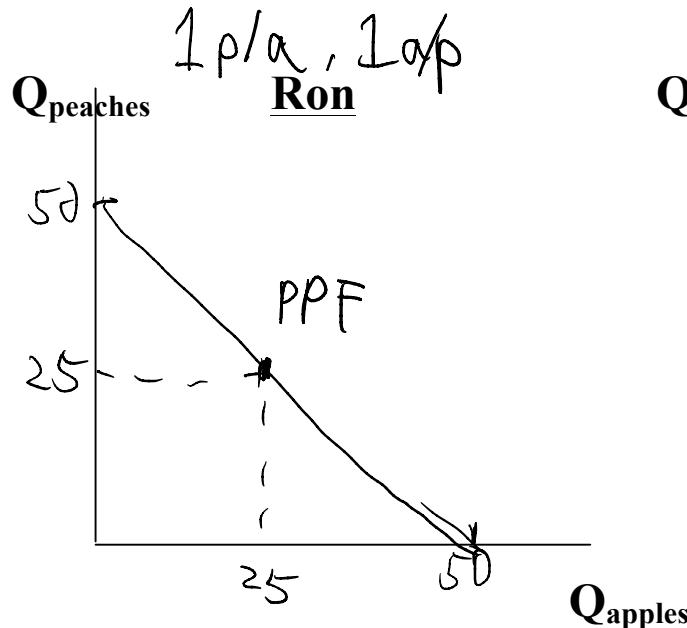
They do not necessarily have to be able to produce more of the good than the other person

Absolute Advantage = when someone can produce more output with a given amount of input.

Example: Farmers Ron and Ted, who grow apples and peaches.



- Using all resources, Ron can produce either 50 kg of apples or 50 kg of peaches.
- Ron chooses to produce 25kg apples and 25kg peaches.
- Using all resources, Ted can produce either 45 kg of apples or 15 kg of peaches.
- Ted chooses to produce 15kg apples and 10 kg peaches.



Ron has to give up 1 kg of peaches to get 1 kg of apples.
 Ron has to give up 1 kg of apples to get 1 kg of peaches.
 Ted has to give up $\frac{1}{3}$ kg of peaches to get 1 kg apples.
 Ted has to give up $\frac{3}{5}$ kg of apples to get 1 kg peaches.

Ted has a comparative advantage growing apples
 and Ron has a comparative advantage growing peaches

Theory predicts both will be better off if *Ted specializes in apples, Ron specializes in peaches, and they trade.*

- Ron will produce 50 kg peaches
- Ted will produce 45 kg apples

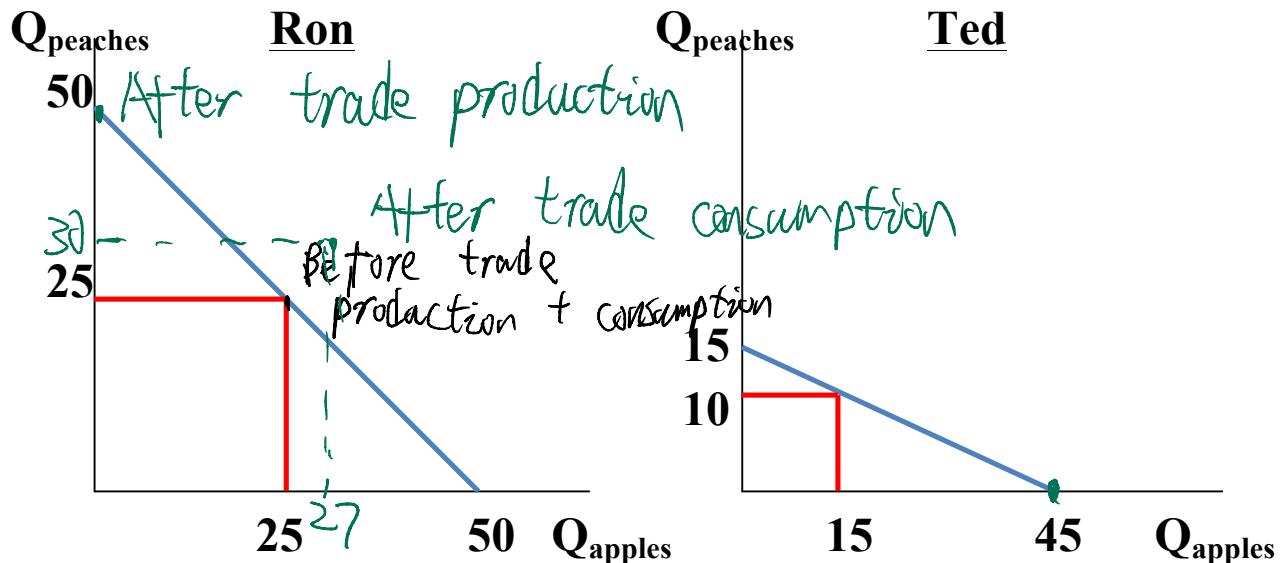
Suppose the **terms of trade** are 27 kg of apples for 20 kg of peaches.

How much will Ron and Ted get to consume?

Ted gives Ron 27 kg apples, and Ron gives Ted 20 kg peaches

	Before Trade		After Trade		
	Production	Consumption	Production	Consumption	Gains from Trade
Ron Apples	25	25	0	27	2
Ron Peaches	25	25	50	30	5
Ted Apples	15	15	45	18	3
Ted Peaches	10	10	0	20	10

Both Ron and Ted are now able to consume more than they can produce. They are consuming *outside* of their PPFs.



NOTE** Even though Ron can produce more of both apples and peaches (Ron has an absolute advantage), each farmer has a **comparative advantage in a different good.**

** Comparative, not absolute advantage is the basis of gains from trade.

That is why it is beneficial for even very large countries to trade with smaller countries.

Specialization and trade allow for consumption (but not production) outside the PPF.

Exercise 1: Use the following table to answer the questions below.

Canada		United States			
	Apples	Oranges	Apples		
A	0	1200	A	0	1800
B	425	1000	B	400	1500
C	850	800	C	800	1200
D	1275	600	D	1200	900
E	1700	400	E	1600	600
F	2125	200	F	2000	300
G	2550	0	G	2400	0

- What is the opportunity cost per apple for Canada? $\frac{1200}{2550} = \frac{120}{255} = \frac{24}{51} = \frac{8}{17}$ (oranges)
- What is the opportunity cost per orange for Canada? $\frac{12}{8}$ (apples)
- What is the opportunity cost per apple for the US? $\frac{1800}{2400} = \frac{18}{24} = \frac{3}{4}$ (oranges)
- What is the opportunity cost per orange for the US? $\frac{4}{3}$ (apples)
- Which country has a comparative advantage in apples? Canada
- Which country has a comparative advantage in oranges? U.S.
- Suppose both countries are currently producing bundle D. Then they decide to specialize and trade. The terms of trade are 1250 apples for 700 oranges.

		Before Trade		After Trade			
		Production	Consumption	Production	Consumption	Gains	
Canada	Apples	1275	1275	2550	1300	25	
	Oranges	600	600	0	700	100	
United States	Apples	1200	1200	0	1250	50	
	Oranges	900	900	1800	1100	200	

3. Transactions: the Circular Flow Diagram

Most transactions use money rather than bartering =



Bartered transactions are difficult to coordinate!

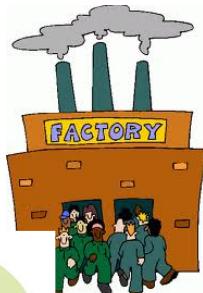
The circular flow diagram is used to illustrate

The model represents transactions and includes households, firms, and markets.

- **Households =**



- **Firms =**



- **Markets =**



- **Goods and Services Markets:**

- **Factor markets:**



E.g. The labour market

Households

Markets for
G&S

Factor
markets

Firms

The circular flow diagram helps explain how baby booms, increased female labour participation, and immigrants are absorbed into an economy.



Models help economists explain the economy, and make predictions and recommendations → economic analysis



1. **Positive economics:** describes how the economy actually works, based on facts and data.
 - Example A: A higher sales tax will decrease the number of new cars sold.
Positive statements are either right or wrong.
2. **Normative economics:** prescribes how the economy should work, based on individual opinion.
 - Example B: The government should tax firms that pollute.
Normative statements can be either agreed with or disagreed with.

Which of these statements are “positive” and which are “normative”?

- a) Prices rise when the government increases the quantity of money.
positive
- b) The government should print less money.
normative
- c) A tax cut is needed to stimulate the economy.
normative
- d) An increase in the price of burritos will cause an increase in consumer demand for shoes.
positive