

E114 : Principles of Economics

First grade

First term

Dr Doaa Akl Ahmed

Associate Professor of Economics

Benha University



Chapter 2

The Economic problem



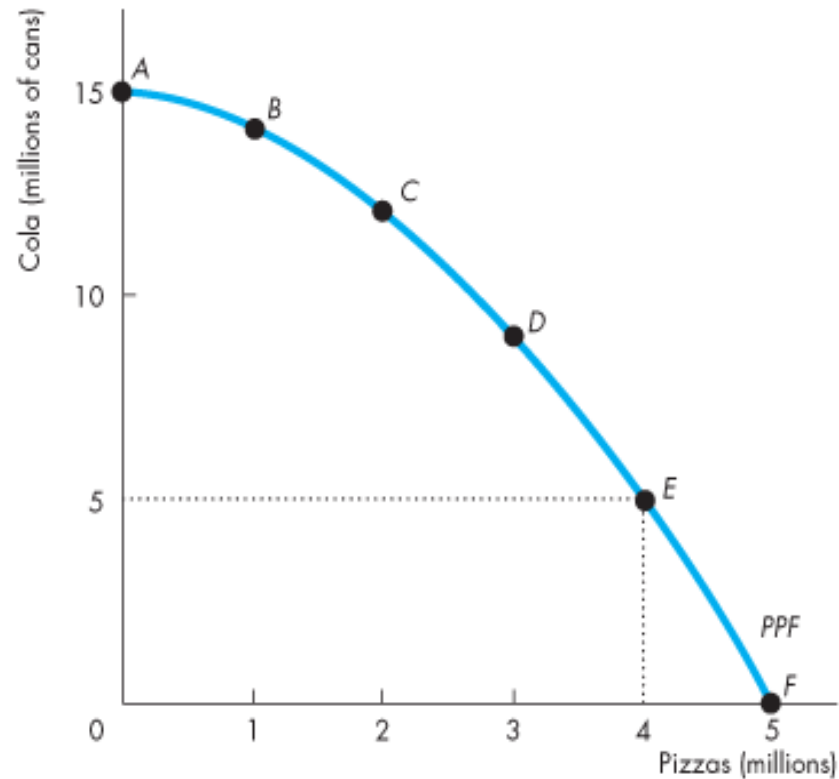
Chapter 2 outline

- 1. Define production Possibility Frontier (PPF)**
- 2. Explain the production efficiency using the PPF**
- 3. Use PPF to calculate the opportunity cost**
- 4. Distinguish between the production possibilities and preferences**
- 5. Explain the efficient allocation of resources**
- 6. Explain how current production choices expand future production possibilities**
- 7. Explain how specialization and trade expand the production possibilities**
- 8. Describe the economic institutions that coordinate decisions**



1. Production Possibility Frontier (PPF)

- The **production possibilities frontier** (*PPF*) is the boundary between those combinations of goods and services that can be produced and those that cannot.
- a model of economy in which everything remains the same except the two goods we're considering.

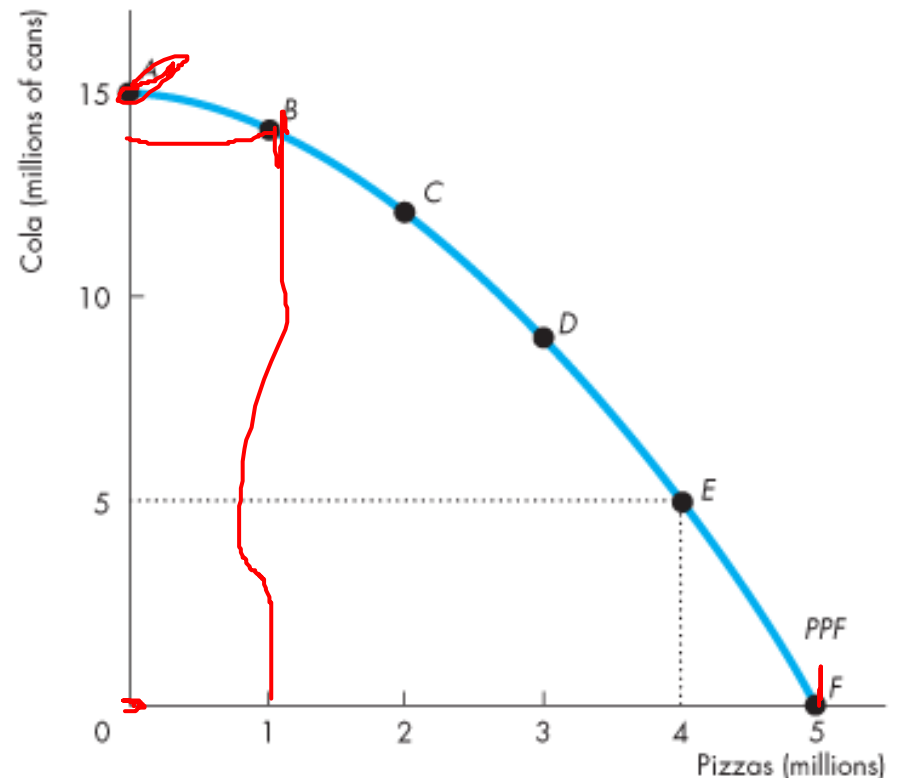


1. Production Possibility Frontier (PPF)

Production Possibilities Frontier

Figure 2.1 shows the *PPF* for two goods: cola and pizzas.

Possibility	Pizzas (millions)	and	Cola (millions of cans)
A	0	and	15
B	1	and	14
C	2	and	12
D	3	and	9
E	4	and	5
F	5	and	0

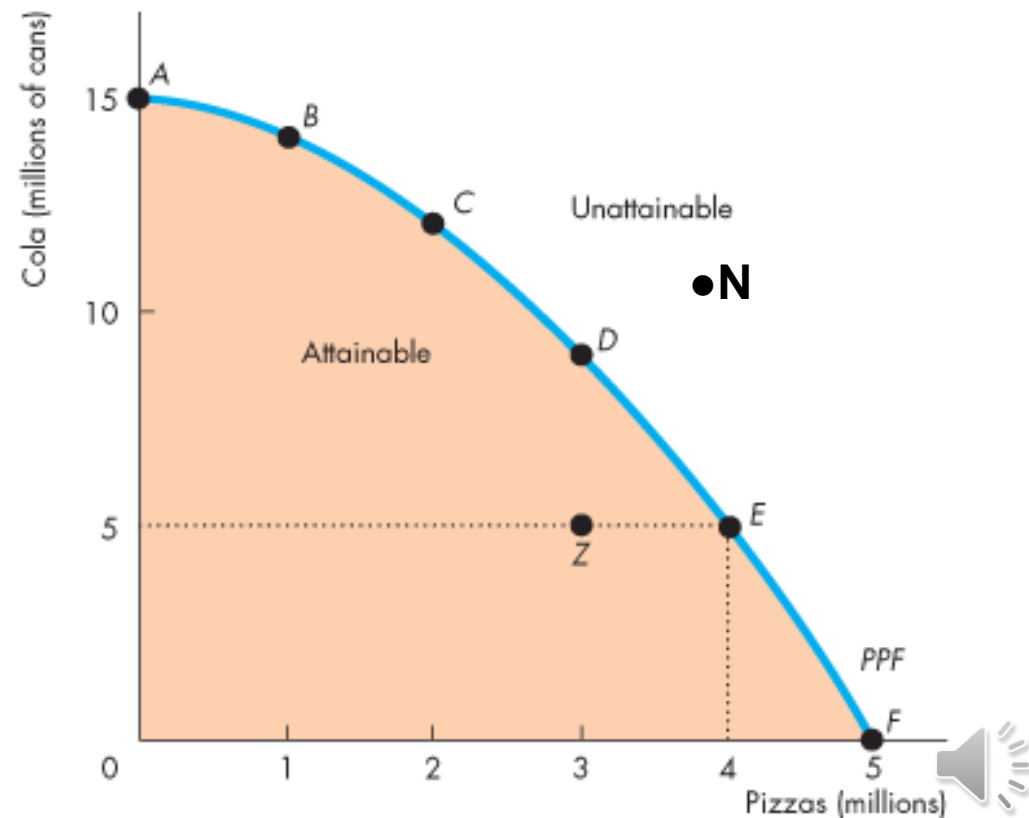


1. Production Possibility Frontier (PPF)

Any point *on* the frontier such as *E* and any point *inside* the *PPF* such as *Z* are attainable.

Points outside the *PPF* are unattainable.

Possibility	Pizzas (millions)		Cola (millions of cans)
A	0	and	15
B	1	and	14
C	2	and	12
D	3	and	9
E	4	and	5
F	5	and	0



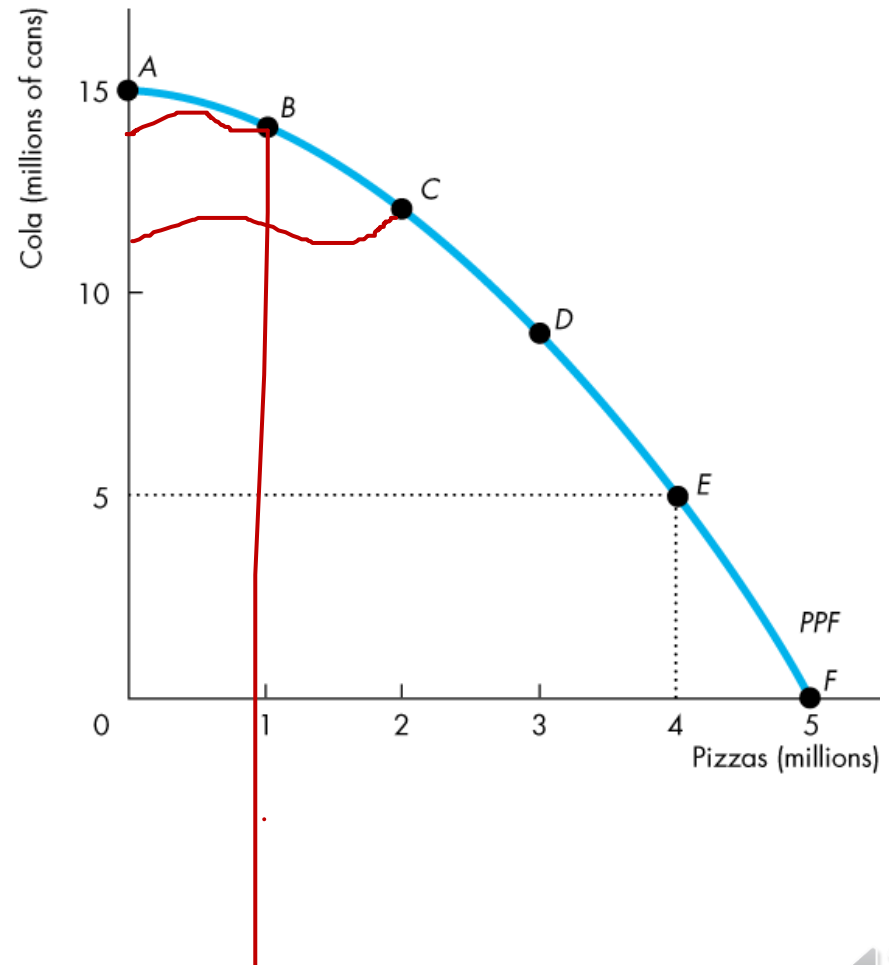
2. PPF and Production Efficiency

Production Efficiency

We achieve **production efficiency** if we cannot produce more of one good without producing less of some other good.

Or if we produce goods and services at the lowest possible cost

Points on the frontier are *efficient*.



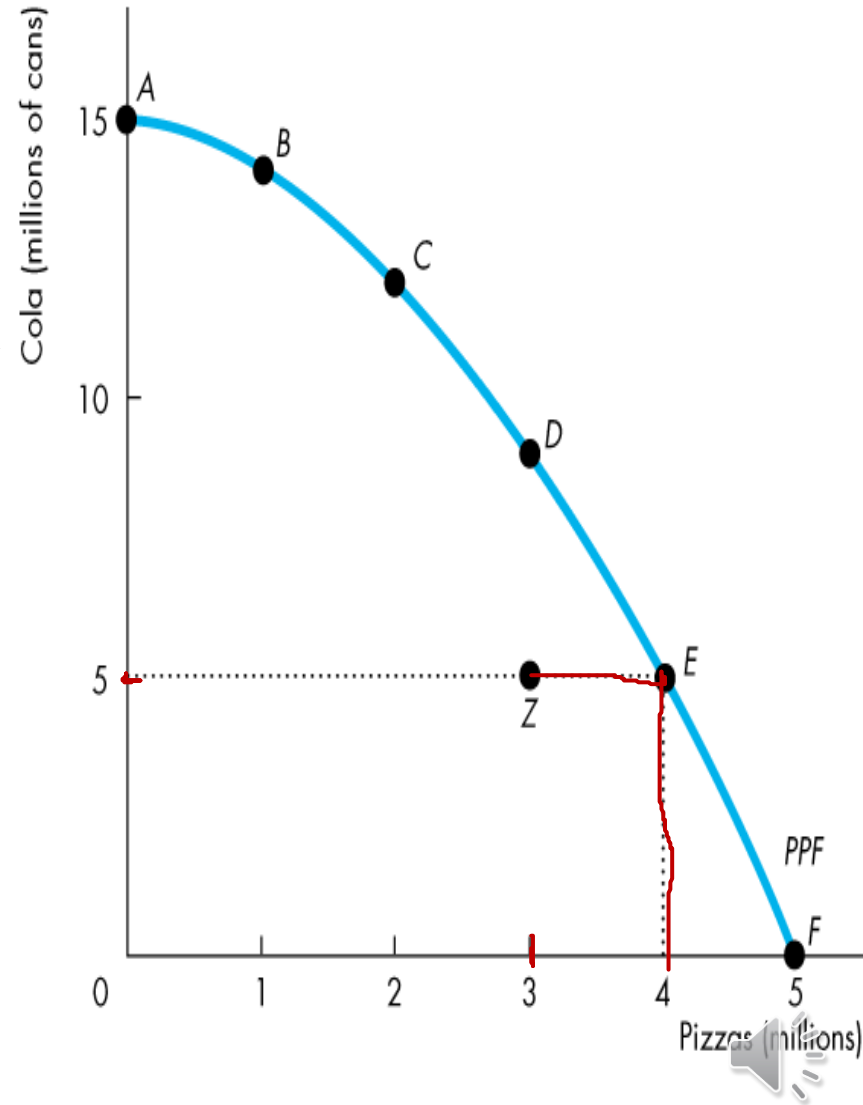
2. PPF and Production Efficiency

Any point inside the frontier, such as Z, is **inefficient**.

At such a point, it is possible to produce more of one good without producing less of the other good.

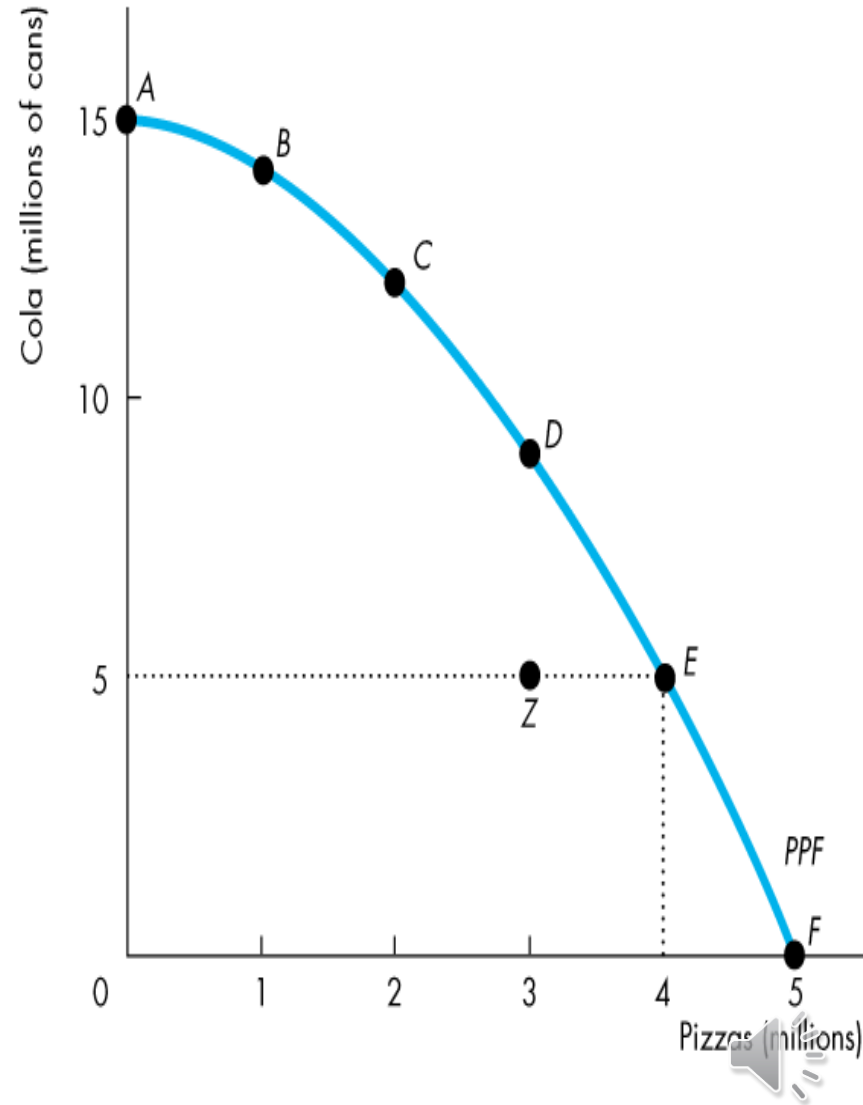
At Z, resources are either **unemployed** or **misallocated** (misused).

Unemployed means some of the factories are idle or some worker are unemployed.



2. PPF and Production Efficiency

- Resources are **misallocated** when they are assigned to tasks for which they are not the best match.
- For example, we might assign skilled pizza chefs to work in a cola factory and skilled cola producers to work in a pizza shop.
- We could get more pizzas and more cola from these same workers if we reassigned them to the tasks that more closely match their skills.

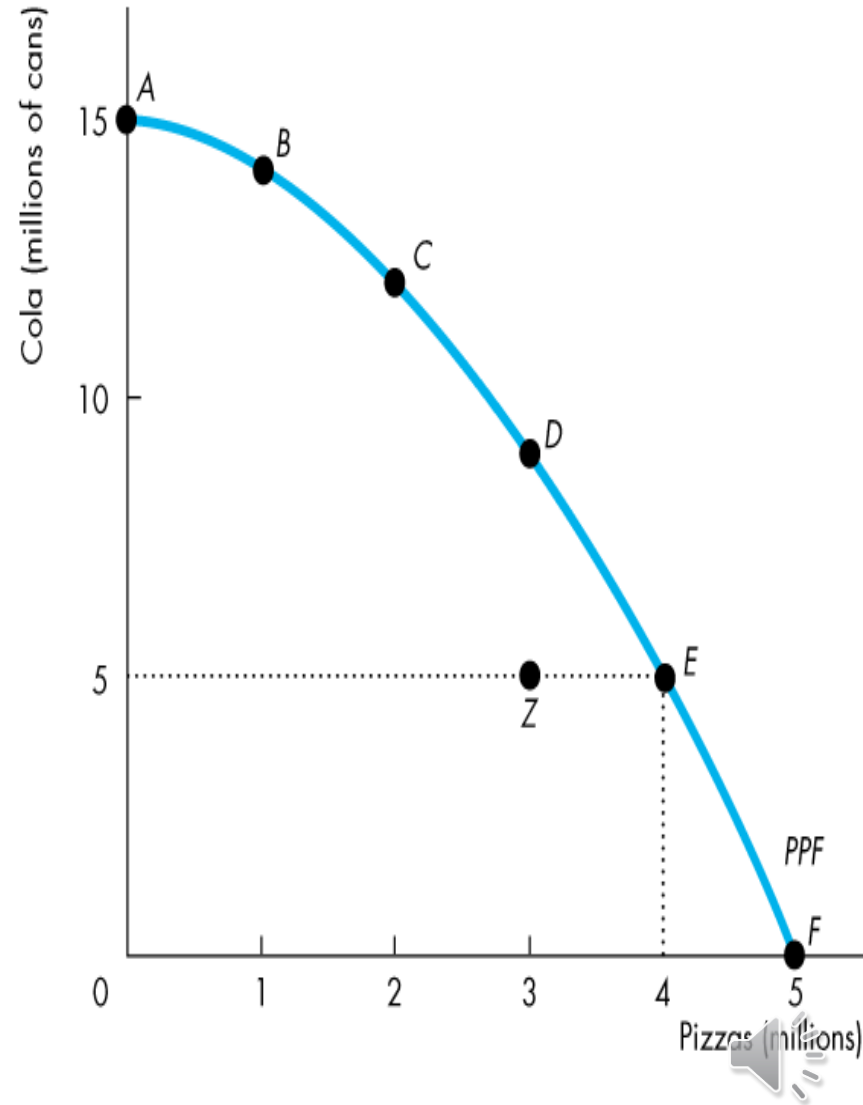


3. PPF and Opportunity Cost

Tradeoff Along the PPF

Every choice along the *PPF* involves a *tradeoff*.

On this *PPF*, we must give up some cola to get more pizzas or give up some pizzas to get more cola



3. PPF and Opportunity Cost

Opportunity Cost

As we move down along the *PPF*, we produce more pizzas, but the quantity of cola we can produce decreases.

The opportunity cost of a pizza is the cola forgone.

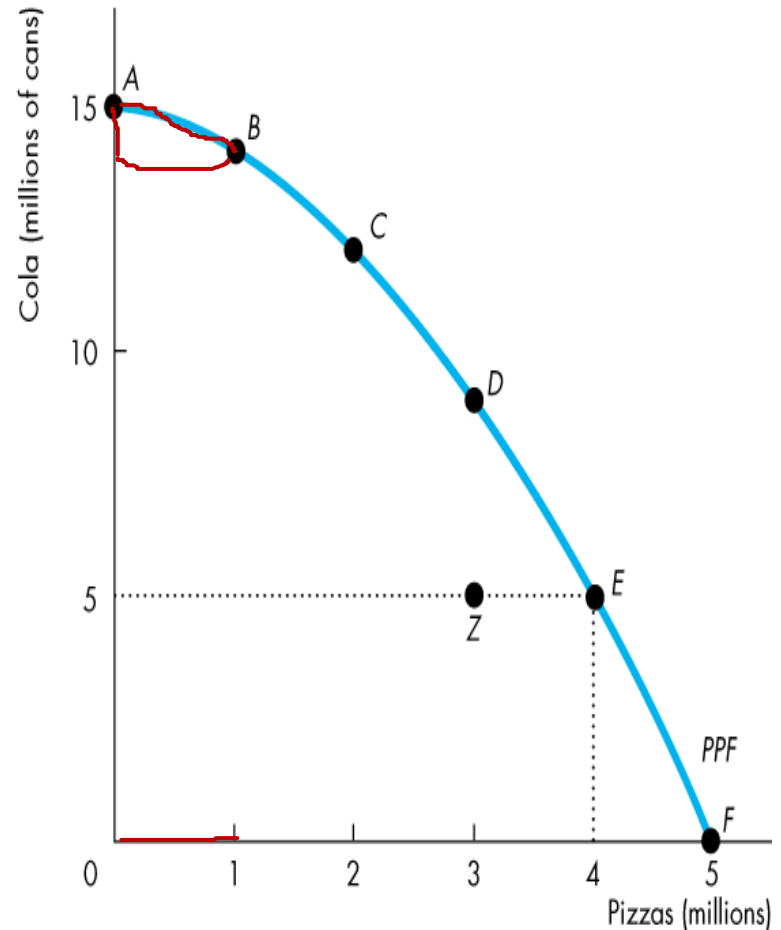
In moving from *A* to *B*:

The quantity of pizzas increases by 1 million.

The quantity of cola decreases by 1 million cans.

The opportunity cost of the first 1 million pizzas is 1 million cans of cola.

One of these pizzas costs 1 cans of cola.



3. PPF and Opportunity Cost

In moving from *F* to *E*:

The quantity of cola increases by 5 million cans.

The quantity of pizzas decreases by 1 million.

The opportunity cost of the first 5 million cans of cola is 1 million pizzas.

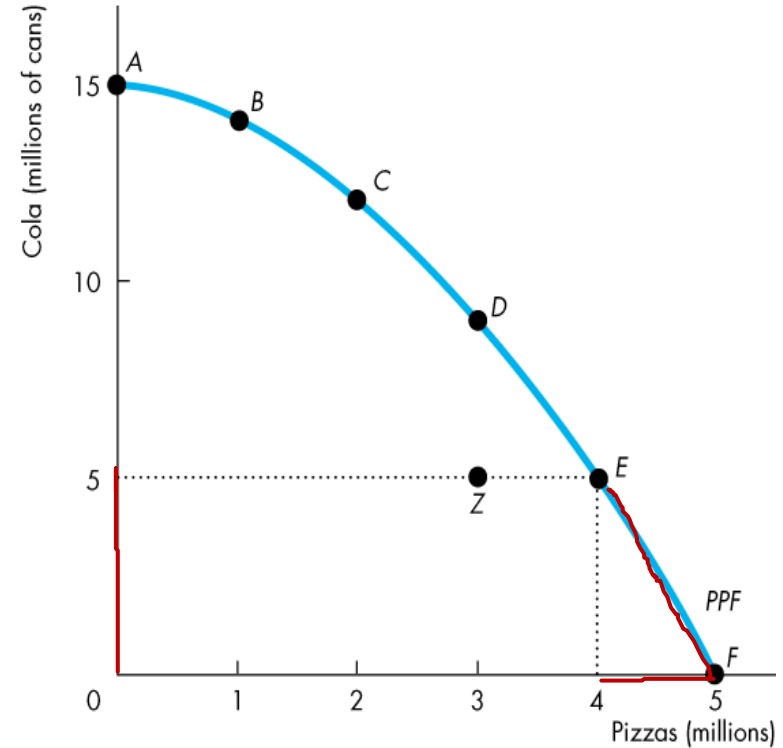
One of these cans of cola costs $1/5$ of a pizza.

Opportunity Cost Is a Ratio

Note that the opportunity cost of a can of cola is the *inverse* of the opportunity cost of a pizza.

One pizza costs 5 cans of cola.

One can of cola costs $1/5$ of a pizza.



1. PPF and Opportunity Cost

Increasing opportunity cost

Moving from B to C:

The quantity of pizza increases by 1 million.

The quantity of cola decreases by 2 million cans.

We give up 2 million cans to increase pizza by 1 million

One pizza costs 2 cans of cola.

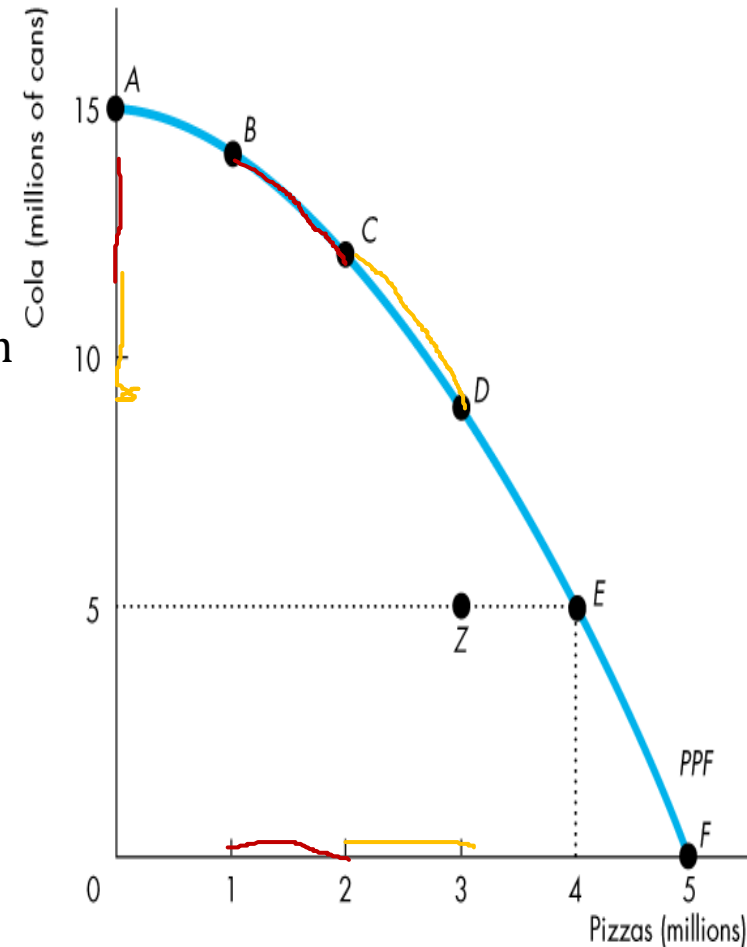
Moving from C to D:

The quantity of pizza increases by 1 million.

The quantity of cola decreases by 3 million.

We give up 3 million can of cola to increase pizza by 1 million

One pizza costs 3 cans of cola



1. PPF and Opportunity Cost

Increasing opportunity cost

Moving from D to E:

The quantity of pizza increases by 1 million cans.

The quantity of pizzas decreases by 4 million.

We give up 4 million cans to increase pizza by 1 million

One pizza costs 4 cans of cola

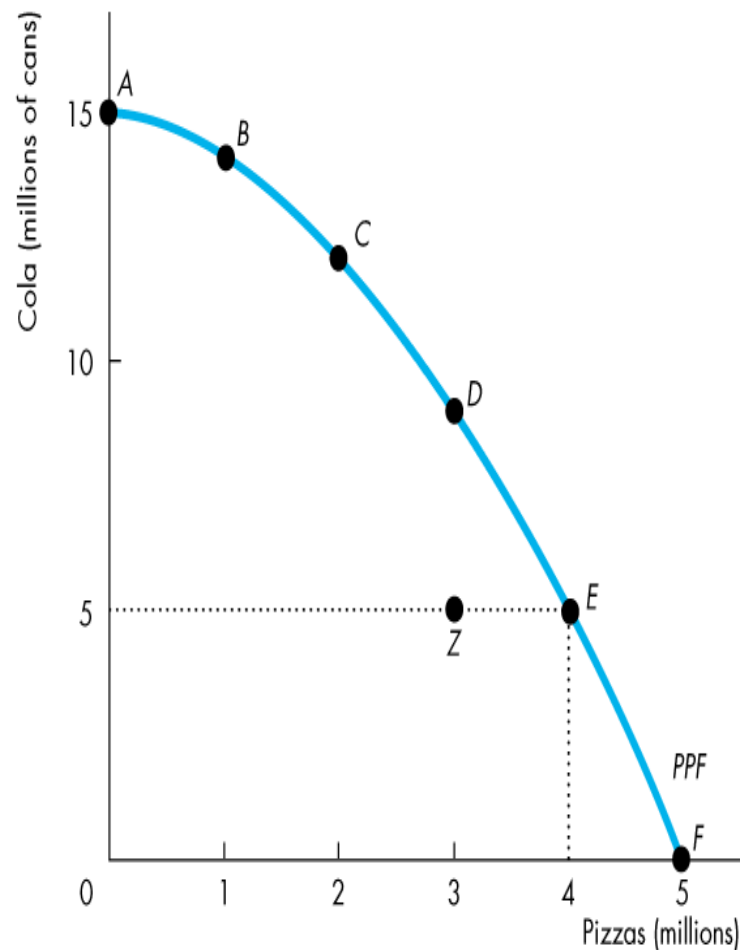
Moving from E to F:

The quantity of pizza increases by 1 million.

The quantity of cola decreases by 5 million cans.

We give up 5 million cans to increase pizza by 1 million

One pizza costs 5 cans of cola

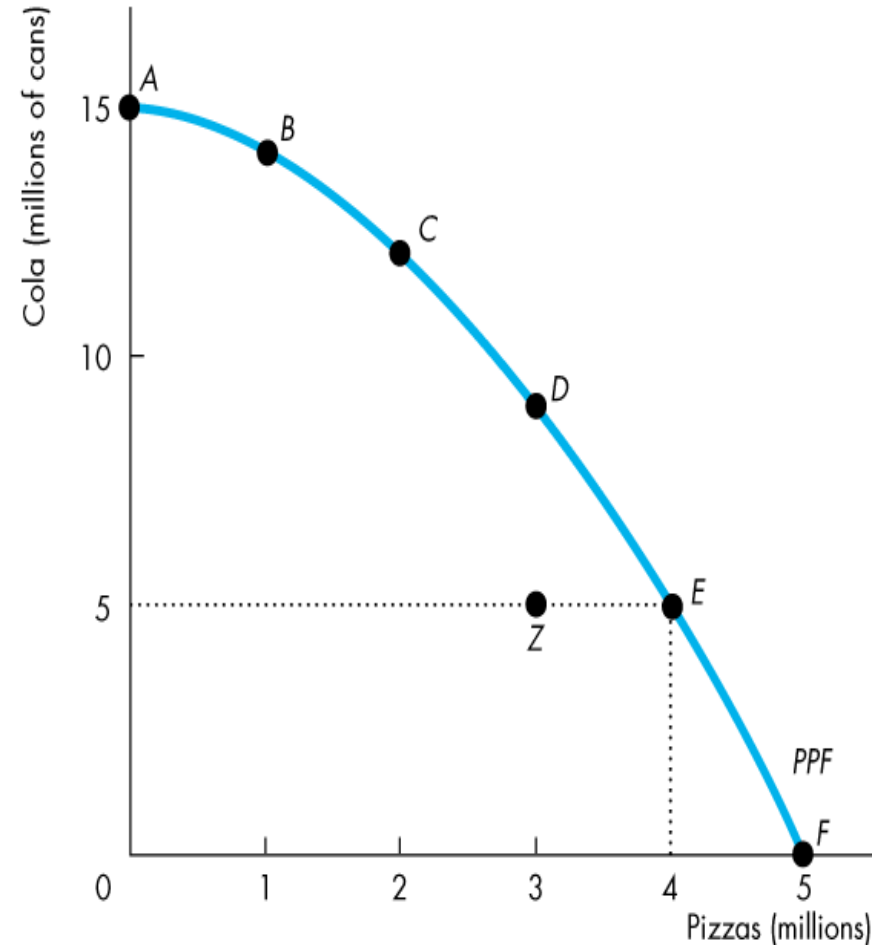


3. PPF and Opportunity Cost

Why Increasing opportunity cost?

The *PPF* is convex outward because resources are not all equally productive in all activities

Moving workers between different activities will be affected by their level of experience



Summary

- The production possibilities frontier is the boundary between production levels that are attainable and those that are not attainable when all the available resources are used to their limit.
- Production efficiency occurs at points on the production possibilities frontier.
- Along the production possibilities frontier, the opportunity cost of producing more of one good is the amount of the other good that must be given up.
- The opportunity cost of all goods increases as the production of the good increases.



Concepts for revision

- Production possibility Frontier
- Production Efficiency
- Misallocation of resources
- Opportunity cost

4. Using Resources Efficiently

- We achieve *production efficiency* at every point on the *PPF*
- **but which point is the best???**

the point on the *PPF* at which goods and services are produced in the quantities that provide **the greatest possible benefit** or at **the lowest cost**

- **Thus, we compare costs and benefits.**
- When goods and services are produced at the lowest possible cost and in the quantities that provide the greatest possible benefit, we have achieved **Allocative Efficiency**.

4. Using Resources Efficiently

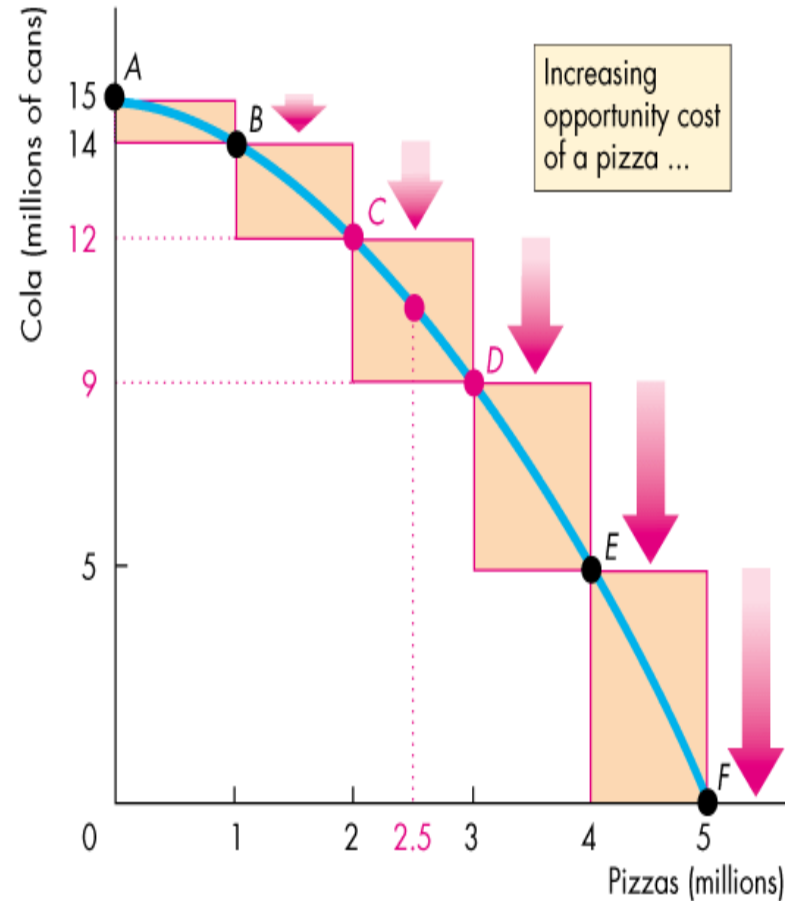
The *PPF* and Marginal Cost

The *PPF* determines opportunity cost.

The **marginal cost** of a good or service is the opportunity cost of producing *one more unit* of it.

Moving along the *PPF*, the opportunity cost of a pizza rises.

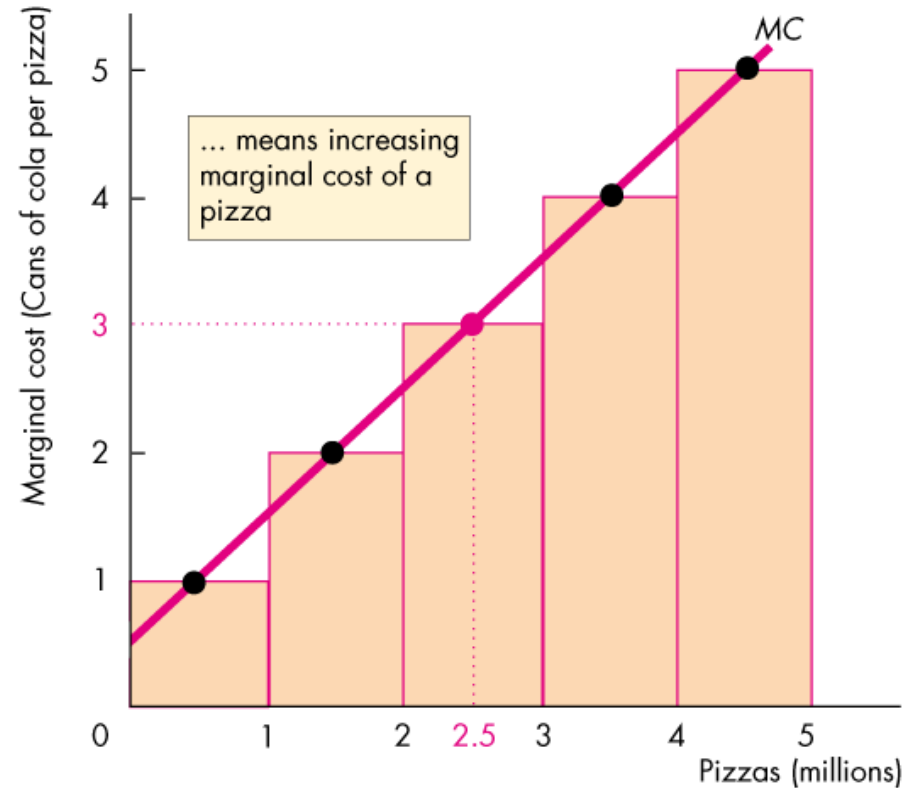
The opportunity cost of producing one more pizza is the marginal cost of a pizza



(a) *PPF* and opportunity cost

4. Using Resources Efficiently

- the bars illustrate the increasing opportunity cost of a pizza (the cost of an average pizza in each of the 1 million pizza blocks)
- The black dots and the line *MC* show the marginal cost of producing a pizza.
- The *MC* curve passes through the center of each bar.



(b) Marginal cost

4. Using Resources Efficiently

Preferences and Marginal Benefit

Preferences

versus

**Production
Possibilities**

It describes what people like and want

It describes the limits or constraints on what is feasible

It represents the Demand side

It represents the Supply side

It is measured by **Marginal Benefit (MB)**

It is measured by **Marginal Cost (MC)**

MB is the benefit received from consuming one more unit of the commodity

MC is the cost resulted from producing one more unit of the commodity

4. Using Resources Efficiently

We measure marginal benefit by the amount that a person is *willing to pay* for an additional unit of a good or service.

It is a general principle that:

The more we have of any good, the smaller is its marginal benefit and ... the less we are willing to pay for an additional unit of it.

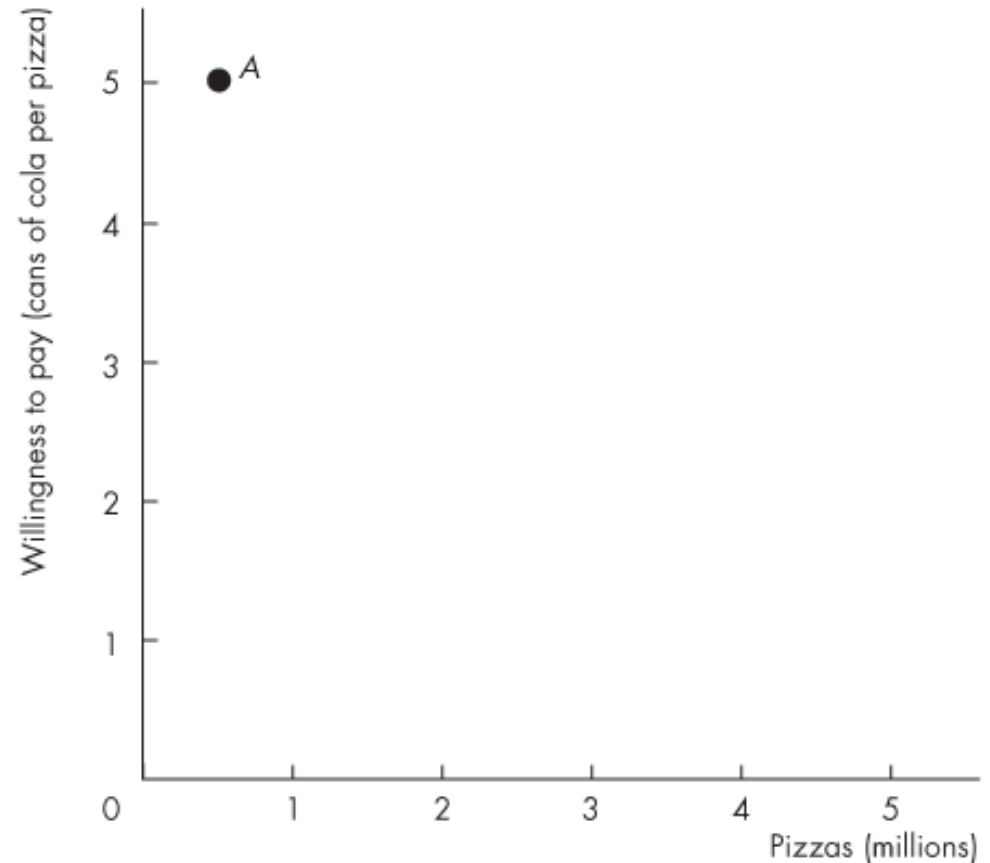
We call this general principle the ***principle of decreasing marginal benefit.***

The **marginal benefit curve** shows the relationship between the marginal benefit of a good and the quantity of that good consumed.

4. Using Resources Efficiently

At point A, with 0.5 million pizzas available, people are willing to pay 5 cans of cola for a pizza.

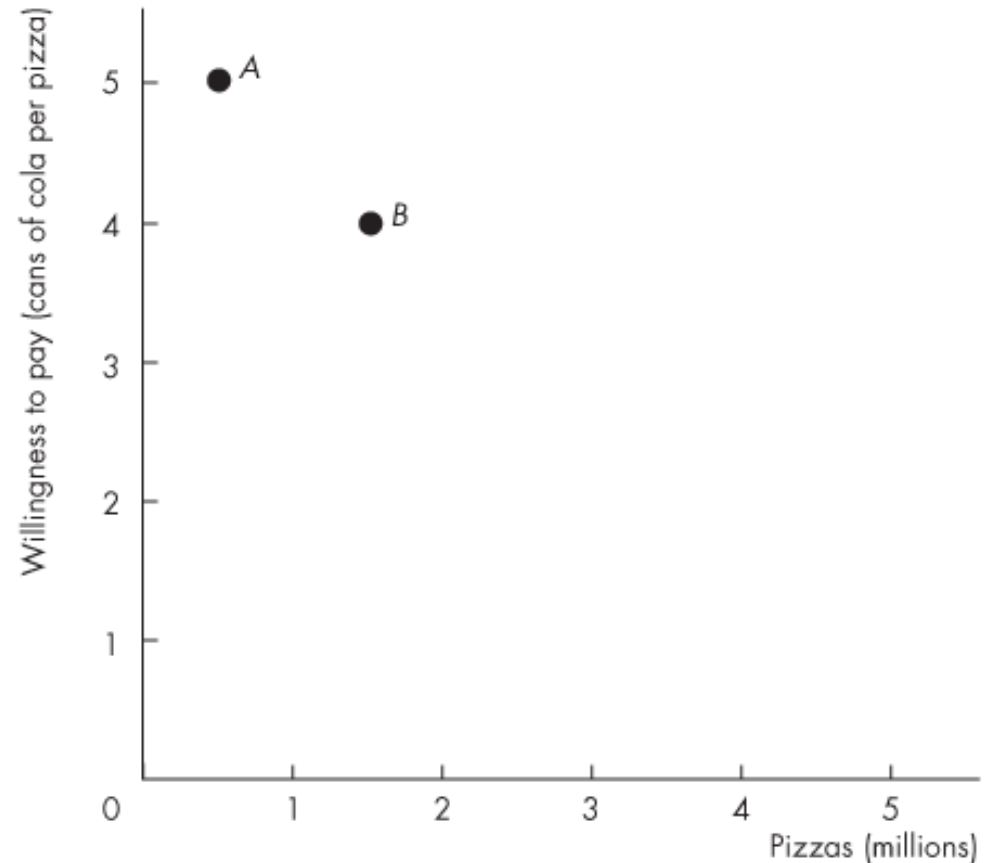
Possibility	Pizzas (millions)	Willingness to pay (cans of cola per pizza)
A	0.5	5



4. Using Resources Efficiently

At point *B*, with pizza 1.5 million pizzas available, people are willing to pay 4 cans of cola for a pizza

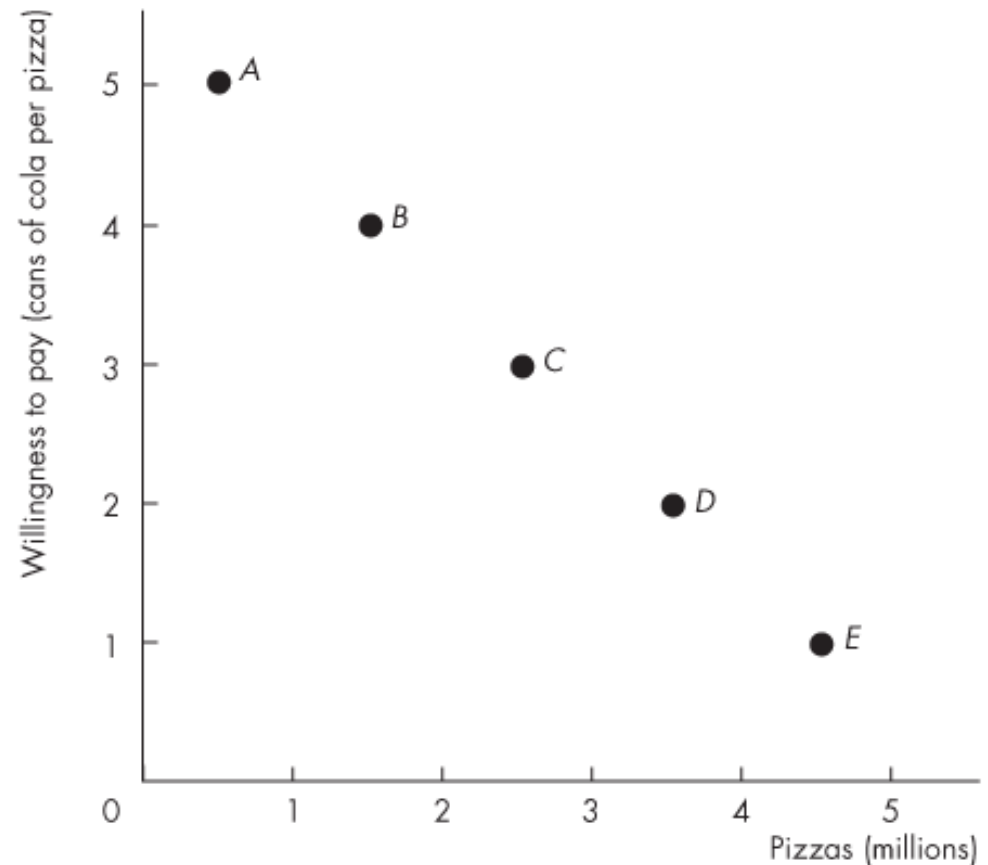
Possibility	Pizzas (millions)	Willingness to pay (cans of cola per pizza)
<i>A</i>	0.5	5
<i>B</i>	1.5	4



4. Using Resources Efficiently

At point *E*, with pizza 4.5 million pizzas available, people are willing to pay 1 can of cola for a pizza.

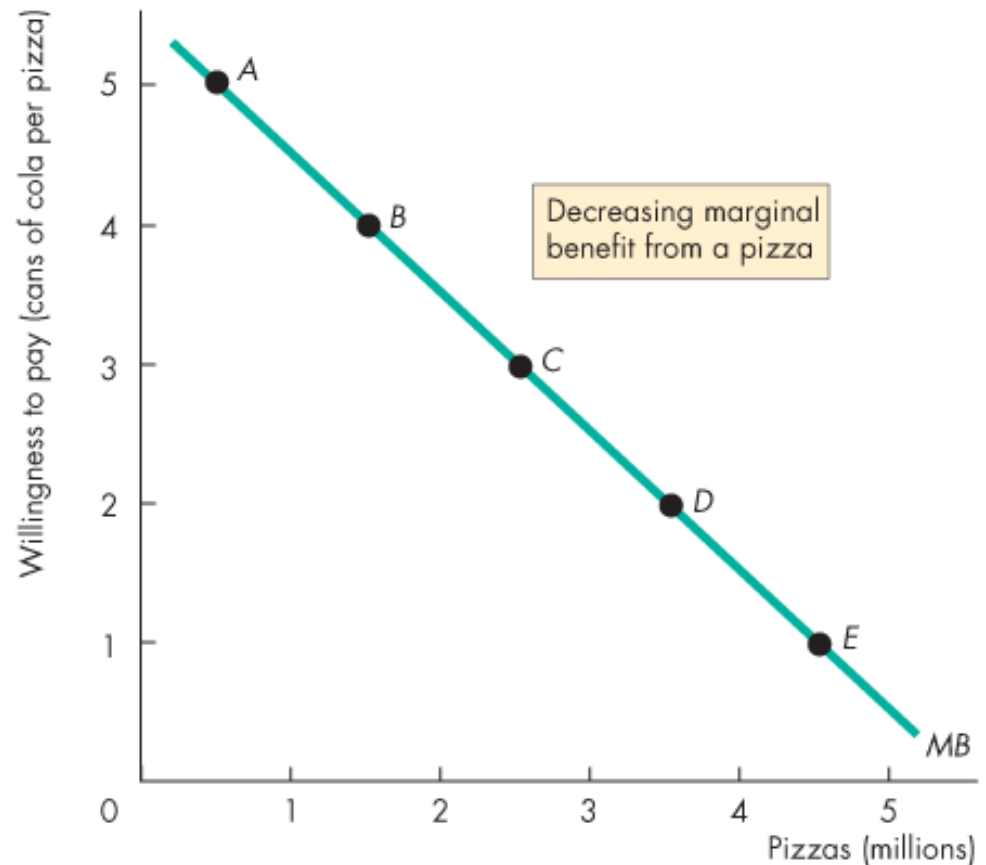
Possibility	Pizzas (millions)	Willingness to pay (cans of cola per pizza)
<i>A</i>	0.5	5
<i>B</i>	1.5	4
<i>C</i>	2.5	3
<i>D</i>	3.5	2
<i>E</i>	4.5	1



4. Using Resources Efficiently

The line through the points shows the marginal benefit from a pizza.

Possibility	Pizzas (millions)	Willingness to pay (cans of cola per pizza)
A	0.5	5
B	1.5	4
C	2.5	3
D	3.5	2
E	4.5	1



4. Using Resources Efficiently

Allocative Efficiency

When we cannot produce more of any one good without giving up some other good, we have achieved **production efficiency**.

We are producing at a point *on* the *PPF*.

Allocative efficiency requires that the goods and services produced are those that provide the greatest possible benefit.

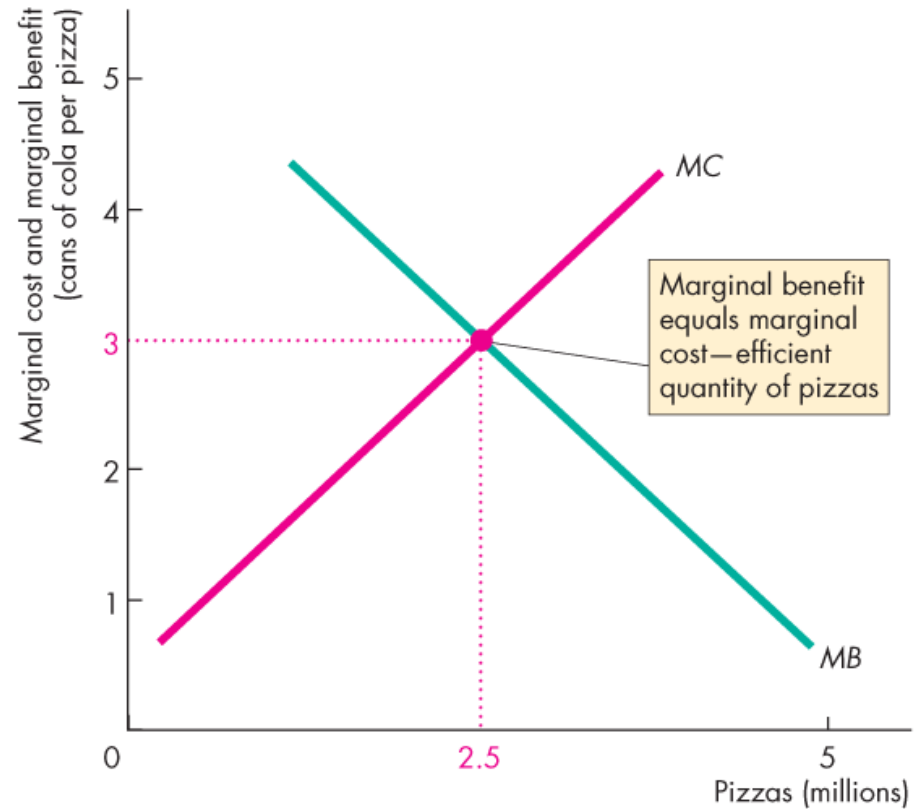
allocative efficient level of output:

is the point on the PPF for which the marginal benefit equals the marginal cost.

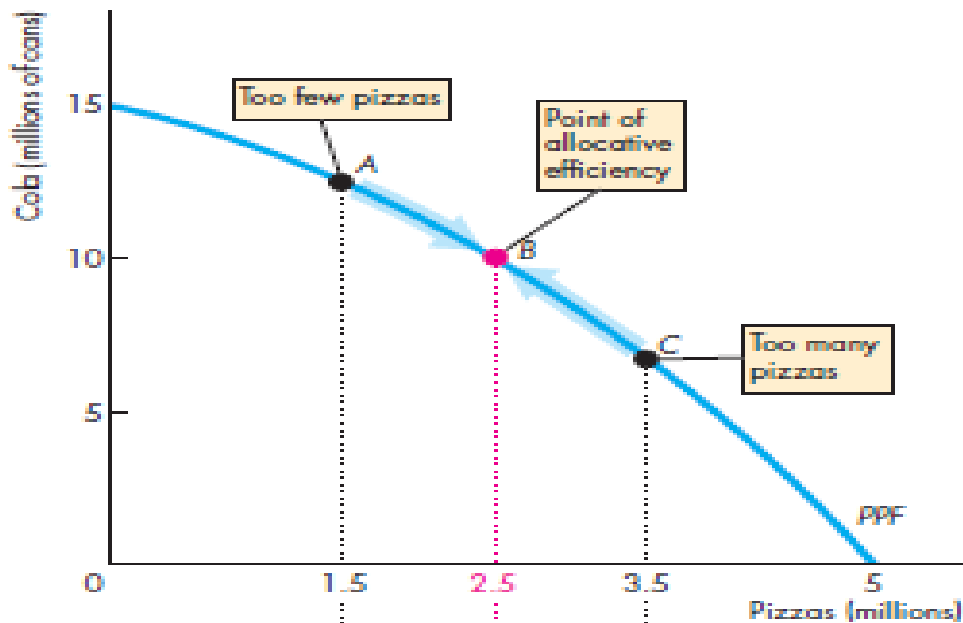
4. Using Resources Efficiently

Figure 2.4 illustrates allocative efficiency.

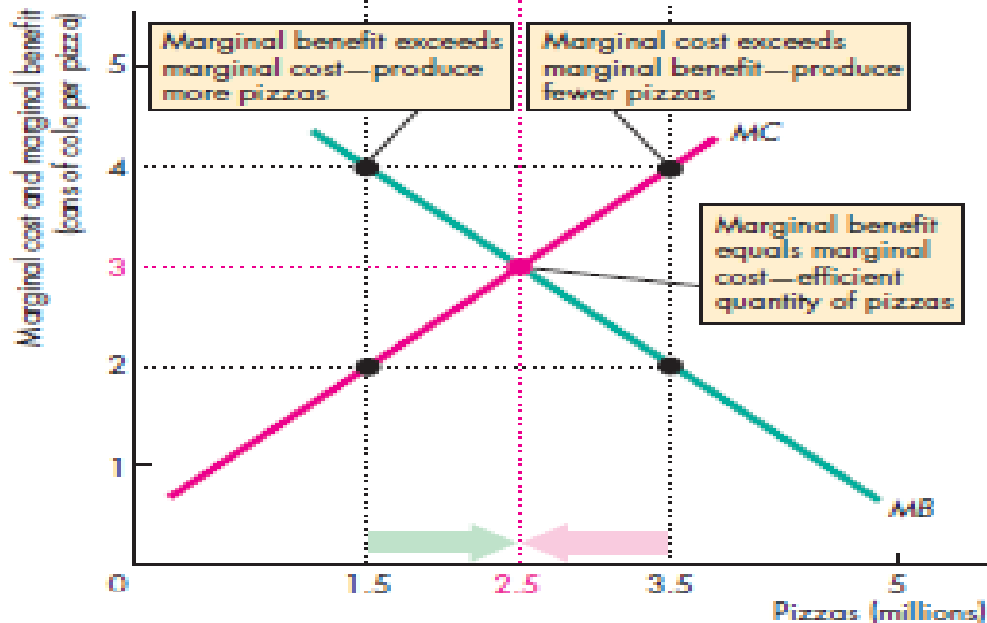
The point of allocative efficiency is determined by the quantity at which the marginal benefit curve intersects the marginal cost curve.



(b) Marginal benefit equals marginal cost



(a) On the PPF



At point A:

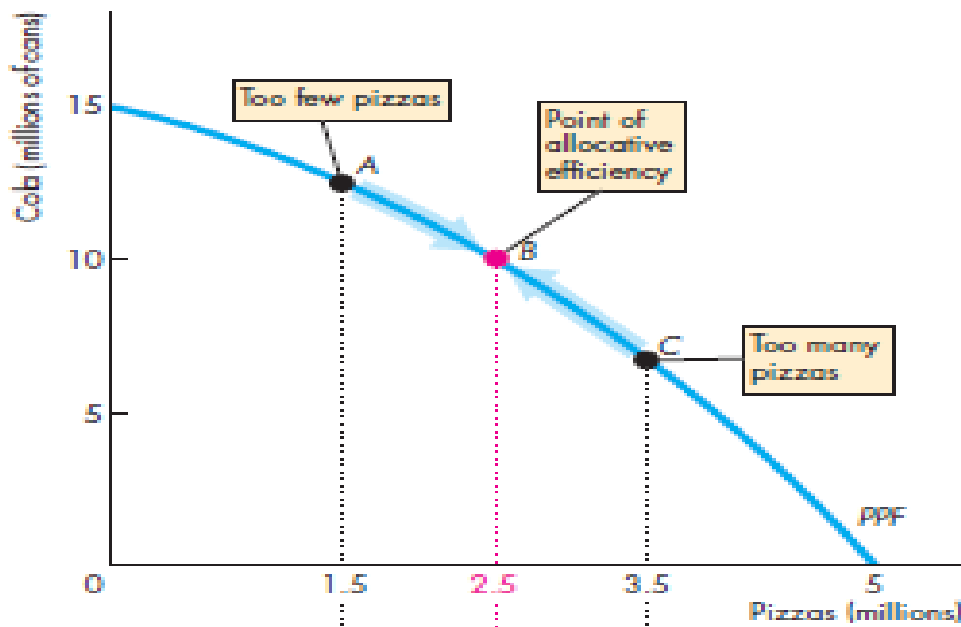
- We produce less than 2.5 million pizzas,
- $MB > MC$

We are better off moving along the PPF to produce more pizzas to satisfy consumer needs

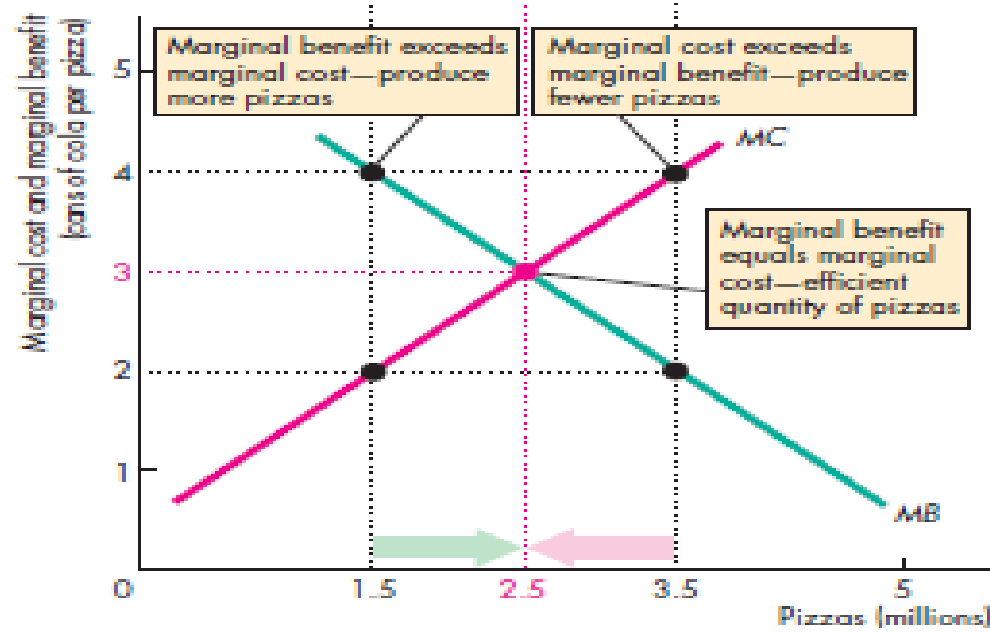
At point C:

- We produce more than 2.5 million pizzas,
- $MC > MB$

We are better off moving along the PPF to produce lower pizzas to satisfy consumer needs



(a) On the PPF



At point B:

- we are producing the efficient quantities of pizzas and cola.
- $MC = MB$
- **We cannot get more value from our resources.**

5. Economic Growth

The expansion (increase) of production possibilities—and increase in the standard of living—is called **economic growth**.

Two key factors influence economic growth:

- Technological change
- Capital accumulation

Technological change is the development of new goods and of better ways of producing goods and services.

Capital accumulation is the growth of capital resources, which includes *human capital*.

5. Economic Growth

Examples of Technological change:

- cars provide us with more transportation than was available when we had only horses and carriages
- satellites provide global communications on a much larger scale than that available with the earlier cable technology.

Examples of Capital accumulation

- A more trained and skilled worker can increase the production.
- Increasing the number of machines and instruments can increase production.

5. Economic Growth

The Cost of Economic Growth

To use resources in research and development and to produce new capital, or providing training for human capital, we must decrease our production of consumption goods and services.

So economic growth is not free.

The opportunity cost of economic growth is less current consumption.

5. Economic Growth

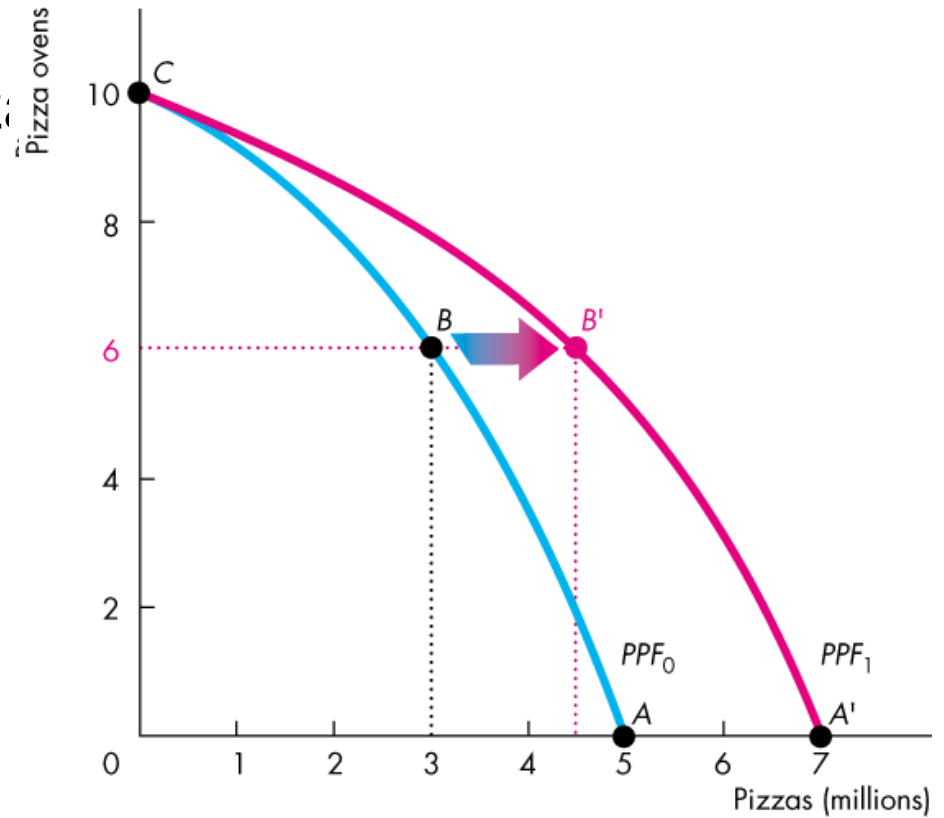
Figure 2.5 illustrates the tradeoff we face.

We can produce pizzas or pizza ovens along PPF_0 .

At point A: all resources are devoted to pizza.

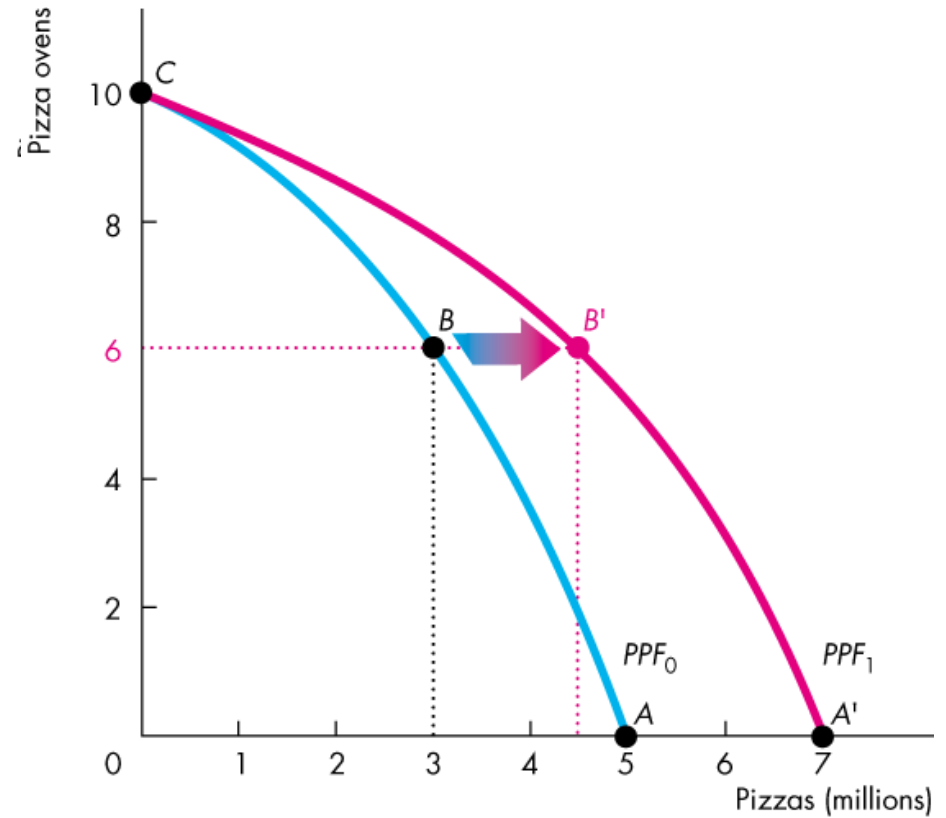
PPF will remain at PPF_0 (no growth)

By using some resources to produce pizza ovens today at point **B**, the PPF shifts outward in the future



5. Economic Growth

- The fewer resources we use for producing pizza (**lower current consumption**) and the more resources we use for producing ovens (**higher investment**), the **greater** is the expansion of our future production possibilities.

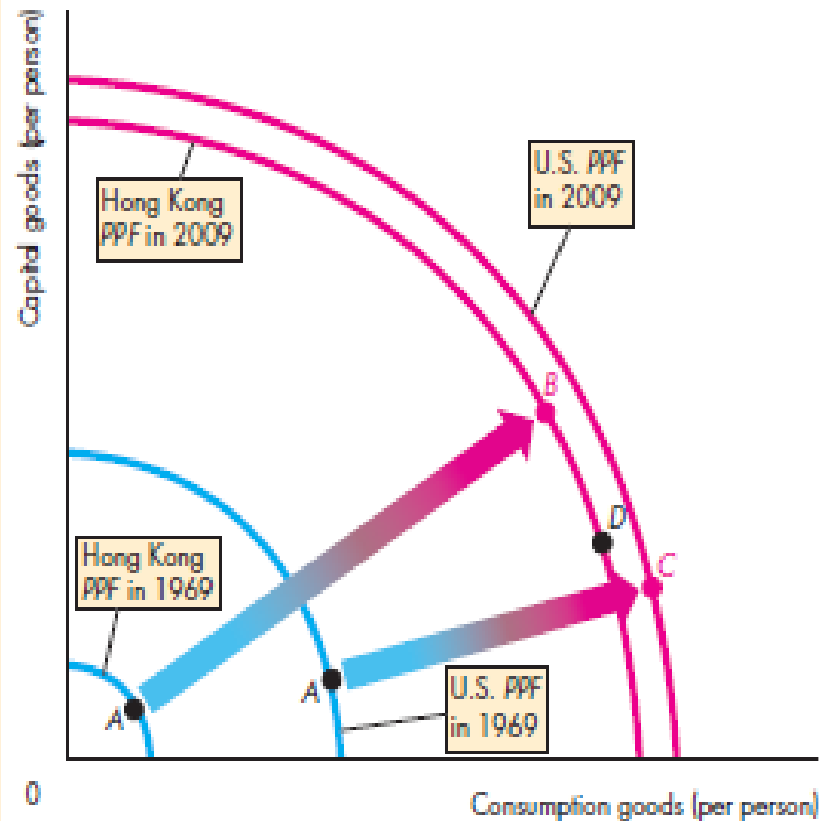


5. Economic Growth

Why has Hong Kong experienced faster economic growth than the USA?

Hong Kong used the available resources to **increase the production of capital goods** in the expense of **decreasing current consumption**

The opposite had occurred in USA



Economic Growth in the United States and Hong Kong

6. Gains from trade

Comparative Advantage and Absolute Advantage

A person has a **comparative advantage** in an activity if that person can perform the activity at a lower opportunity cost than anyone else.

Differences in opportunity costs arise from differences in individual abilities and from differences in the characteristics of other resources.

If one has a comparative advantage in producing something, he should specialize in production of that good or service

A person has an **absolute advantage** if that person is more productive than others.

Absolute advantage involve comparing productivities while comparative advantage involves comparing opportunity costs.

6. Gains from trade

Liz's Smoothie Bar

In an hour, Liz can produce 30 smoothies or 30 salads.

Liz's opportunity cost of producing 1 smoothie is 1 salad.

Liz's opportunity cost of producing 1 salad is 1 smoothie

She can do both activities equally (absolute advantage)

Liz's customers buy salads and smoothies in equal number, so she produces 15 smoothies and 15 salads an hour.

TABLE 2.1 Liz's Production Possibilities

Item	Minutes to produce 1	Quantity per hour
Smoothies	2	30
Salads	2	30

6. Gains from trade

Joe's Smoothie Bar

In an hour, Joe can produce 6 smoothies or 30 salads.

Joe's opportunity cost of producing 1 smoothie is 5 salads.

Joe's opportunity cost of producing 1 salad is $\frac{1}{5}$ smoothie.

TABLE 2.2 Joe's Production Possibilities

Item	Minutes to produce 1	Quantity per hour
Smoothies	10	6
Salads	2	30

Joe's spend 10 minutes making salads and 50 minutes making smoothies, so he produces 5 smoothies and 5 salads an hour.

6. Gains from trade

Liz's Comparative Advantage

Liz's opportunity cost of a smoothie is 1 salad.

Joe's opportunity cost of a smoothie is 5 salads.

Liz's opportunity cost of a smoothie is less than Joe's.

So Liz has a comparative advantage in producing smoothies.

6. Gains from trade

Joe's Comparative Advantage

Joe's opportunity cost of a salad is $\frac{1}{5}$ smoothie.

Liz's opportunity cost of a salad is 1 smoothie.

Joe's opportunity cost of a salad is less than Liz's.

So Joe has a comparative advantage in producing salads.

6. Gains from trade

Achieving the Gains from Trade

Liz and Joe produce the good in which they have a comparative advantage:

- Liz produces 30 smoothies and 0 salads.
- Joe produces 30 salads and 0 smoothies.

TABLE 2.3 Liz and Joe Gain from Trade

(a) Before trade	Liz	Joe
Smoothies	15	5
Salads	15	5

(b) Specialization	Liz	Joe
Smoothies	30	0
Salads	0	30

TABLE 2.3 Liz and Joe Gain from Trade

(a) Before trade	Liz	Joe
Smoothies	15	5
Salads	15	5
<hr/>		
(b) Specialization	Liz	Joe
Smoothies	30	0
Salads	0	30
<hr/>		
(c) Trade	Liz	Joe
Smoothies	sell 10	buy 10
Salads	buy 20	sell 20
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(d) After trade	Liz	Joe
Smoothies	20	10
Salads	20	10
<hr/>		
(e) Gains from trade	Liz	Joe
Smoothies	+5	+5
Salads	+5	+5

6. Gains from trade

Liz and Joe trade:

- Liz sells Joe 10 smoothies and buys 20 salads.
- Joe sells Liz 20 salads and buys 10 smoothies.

After trade:

- Liz has 20 smoothies and 10 salads.
- Joe has 10 smoothies and 20 salads.

TABLE 2.3 Liz and Joe Gain from Trade

(a) Before trade	Liz	Joe
Smoothies	15	5
Salads	15	5
(b) Specialization	Liz	Joe
Smoothies	30	0
Salads	0	30
(c) Trade	Liz	Joe
Smoothies	sell 10	buy 10
Salads	buy 20	sell 20
(d) After trade	Liz	Joe
Smoothies	20	10
Salads	20	10

6. Gains from trade

Gains from trade:

- Liz gains 5 smoothies and 5 salads an hour
- Joe gains 5 smoothies and 5 salads an hour

TABLE 2.3 Liz and Joe Gain from Trade

(a) Before trade	Liz	Joe
Smoothies	15	5
Salads	15	5
(b) Specialization	Liz	Joe
Smoothies	30	0
Salads	0	30
(c) Trade	Liz	Joe
Smoothies	sell 10	buy 10
Salads	buy 20	sell 20
(d) After trade	Liz	Joe
Smoothies	20	10
Salads	20	10
(e) Gains from trade	Liz	Joe
Smoothies	+5	+5
Salads	+5	+5

7. Economic Coordination

To reap the gains from trade, the choices of individuals must be coordinated.

To make coordination work, four social institutions have evolved over the centuries:

- Firms
- Markets
- Property rights
- Money

7. Economic Coordination

A **firm** is an economic unit that hires factors of production and organizes those factors to produce and sell goods and services.

A **market** is any arrangement that enables buyers and sellers to get information and do business with each other.

Property rights are the social arrangements that govern ownership, use, and disposal of resources, goods or services.

Money is any commodity or token that is generally acceptable as a means of payment.

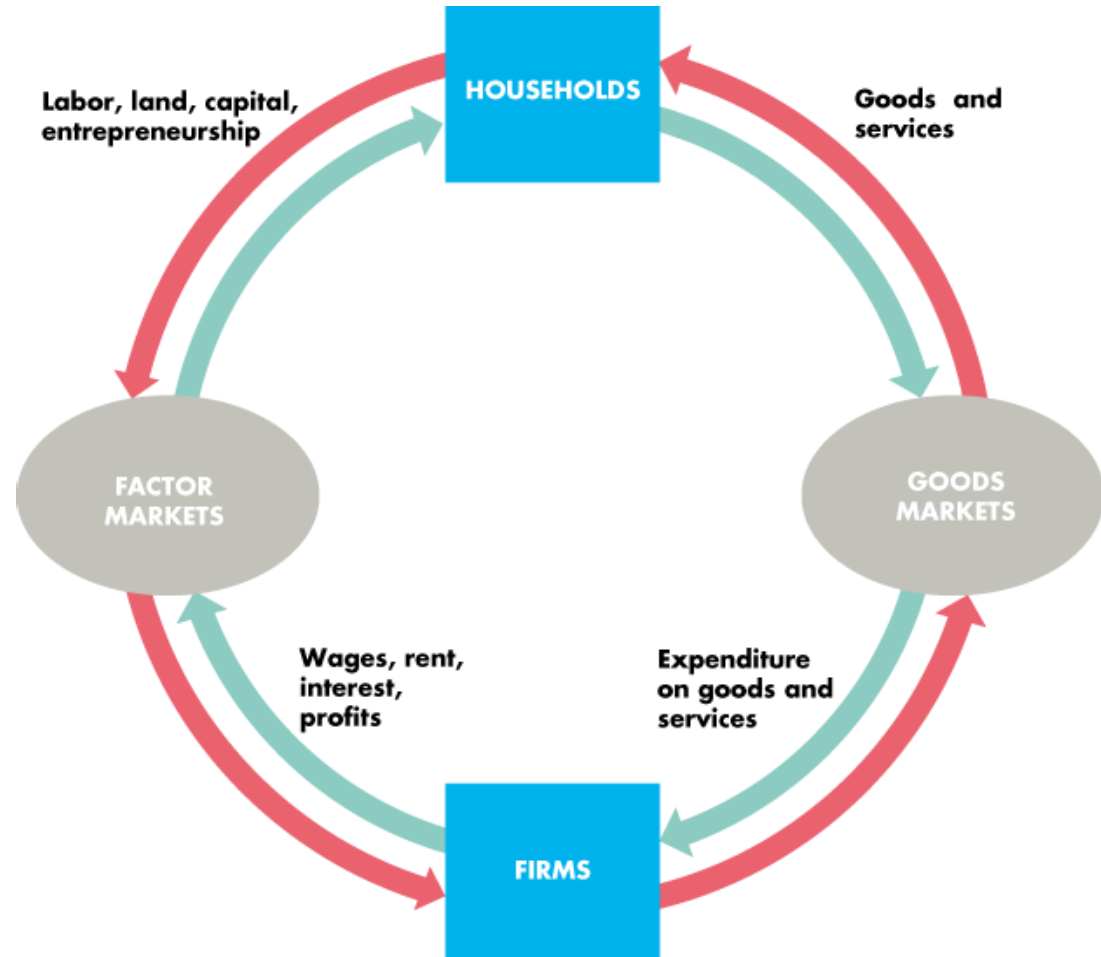
7. Economic Coordination

Circular Flows Through Markets

Figure 2.7 illustrates how households and firms interact in the market economy.

Factors of production, goods and services flow in one direction.

Money flows in the opposite direction.



7. Economic Coordination

Coordinating Decisions

Markets coordinate individual decisions through price adjustments.

