

2

THE ECONOMIC PROBLEM

Production Possibilities and Opportunity Cost

The **production possibilities frontier** (*PPF*) is the boundary between those combinations of goods and services that can be produced and those that cannot.

To illustrate the *PPF*, we focus on two goods at a time and hold the quantities of all other goods and services constant.

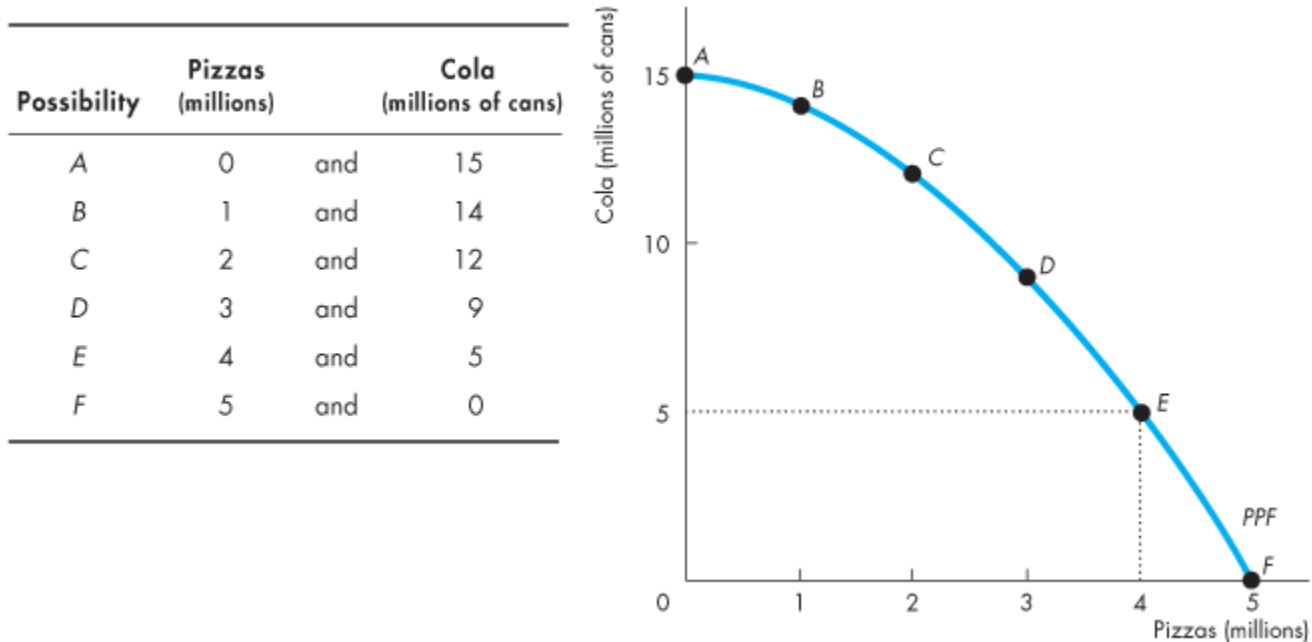
That is, we look at a model economy in which everything remains the same (*ceteris paribus*) except the two goods we're considering.

Production Possibilities and Opportunity Cost



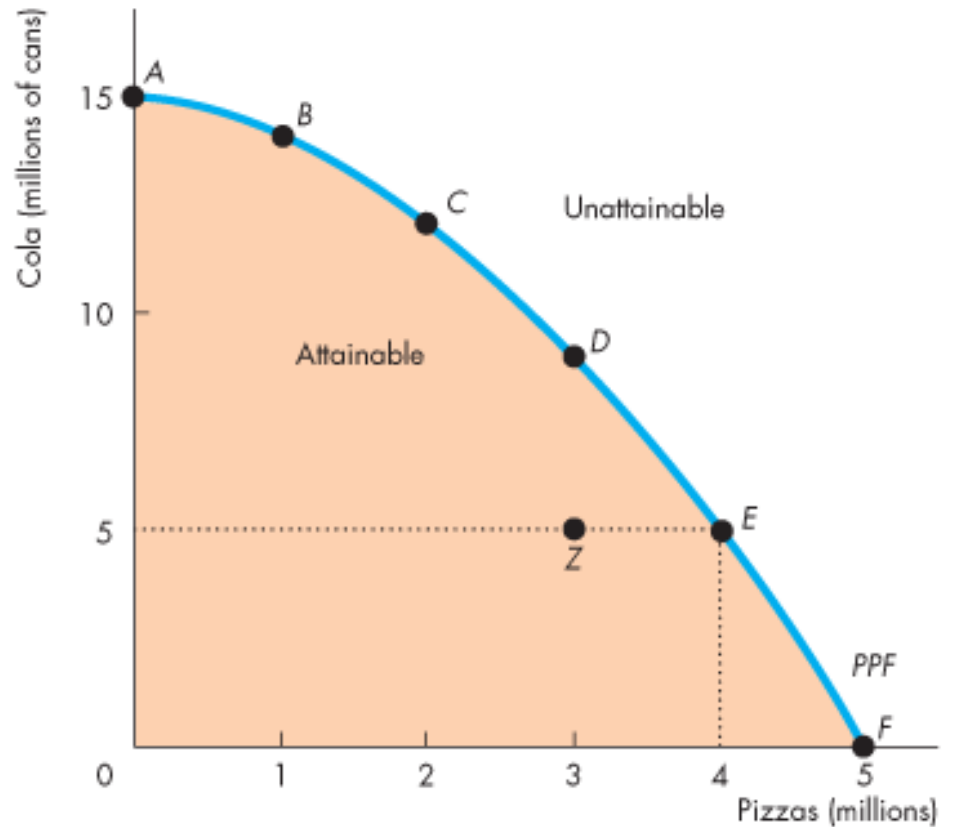
Production Possibilities Frontier

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





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

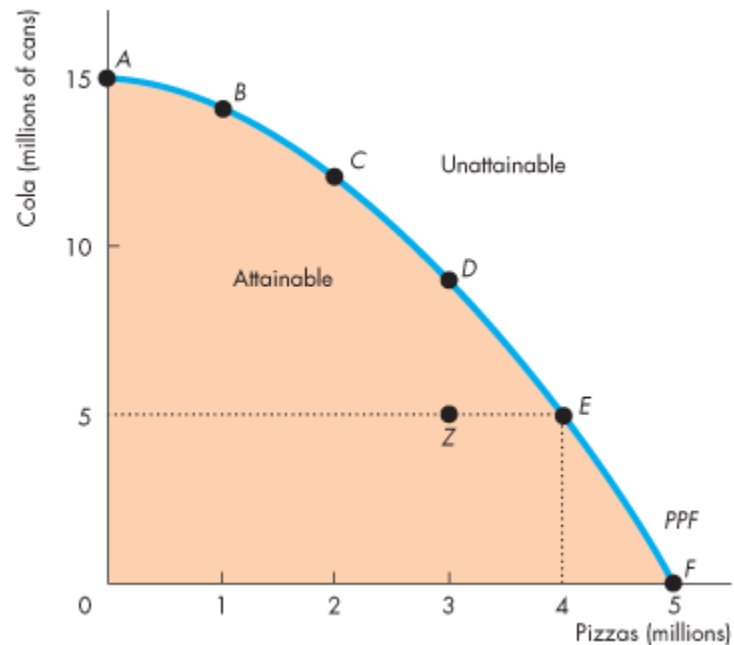


Production Possibilities and Opportunity Cost

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)	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



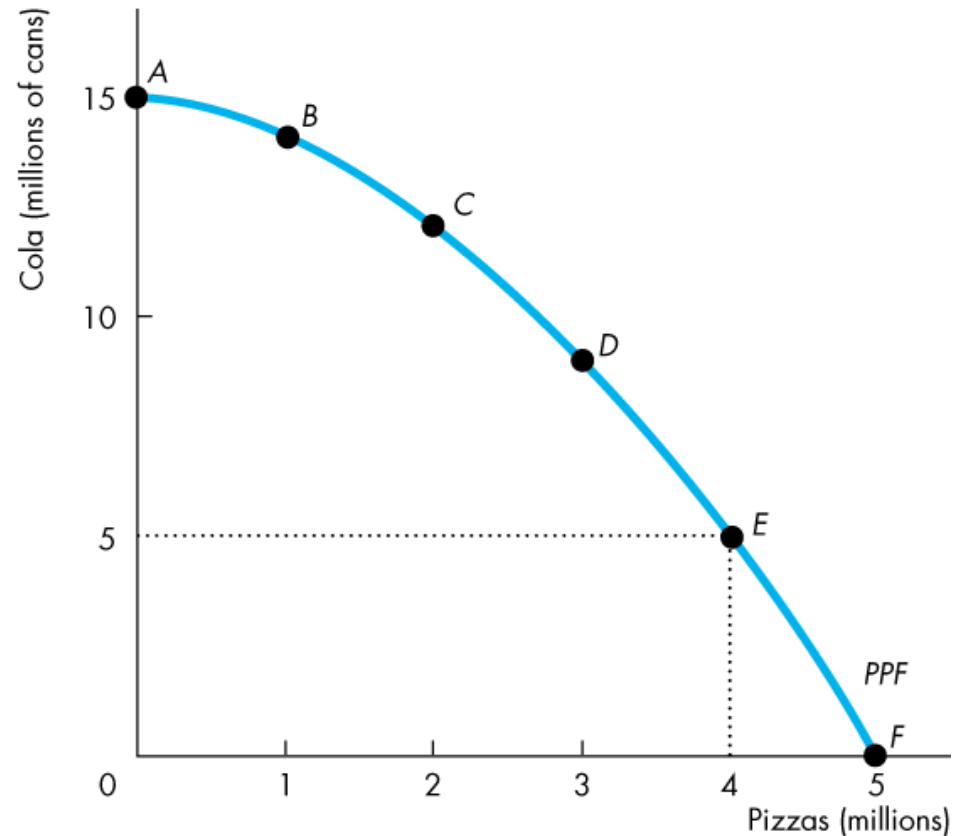
Production Possibilities and Opportunity Cost

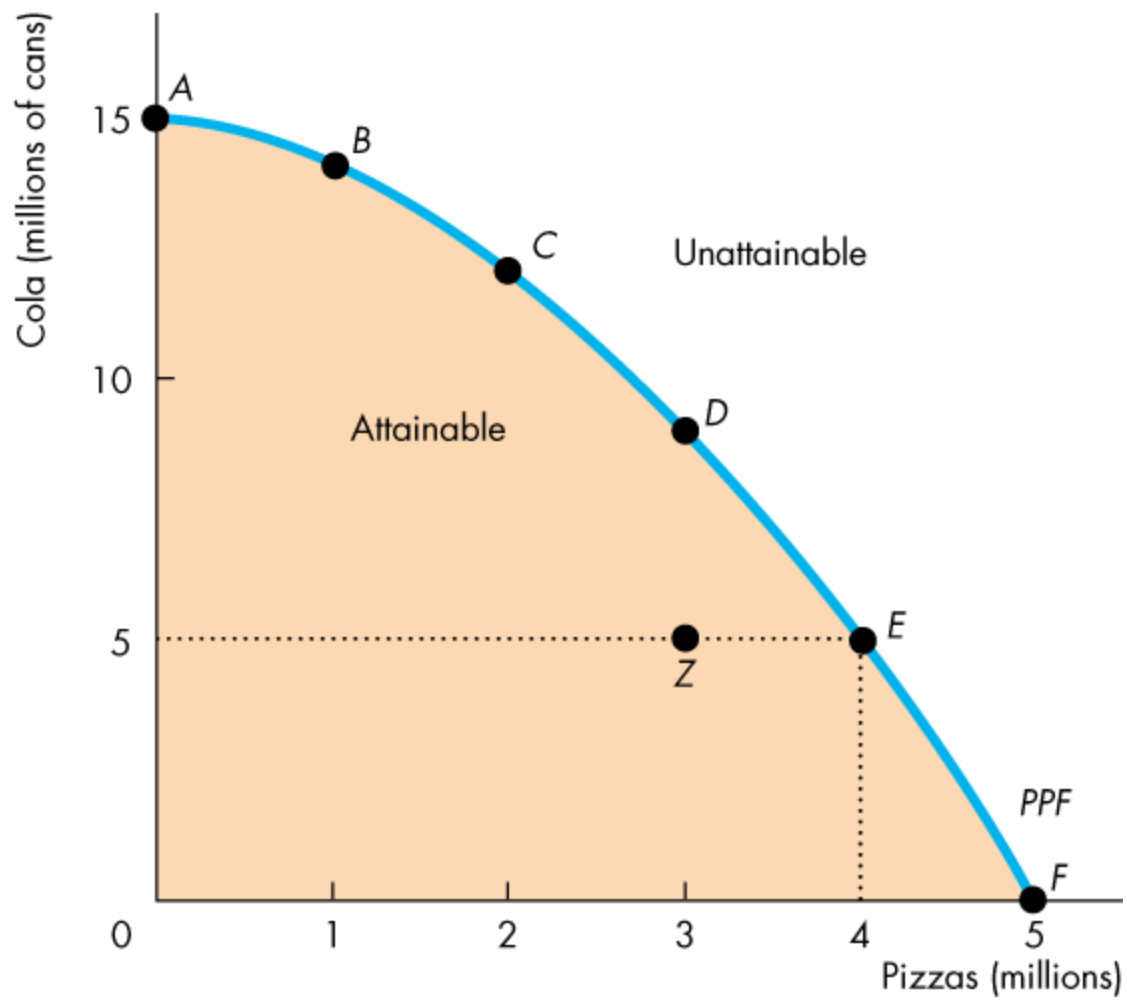


Production Efficiency

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

Points on the frontier are *efficient*.



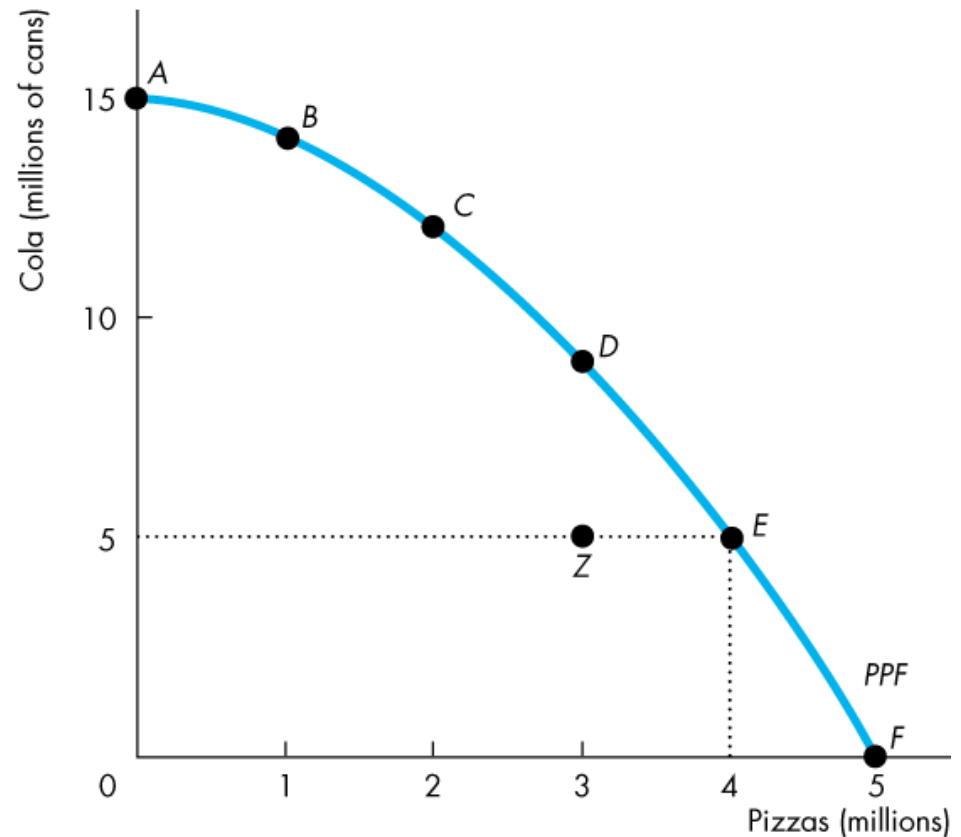


Production Possibilities and Opportunity Cost

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.

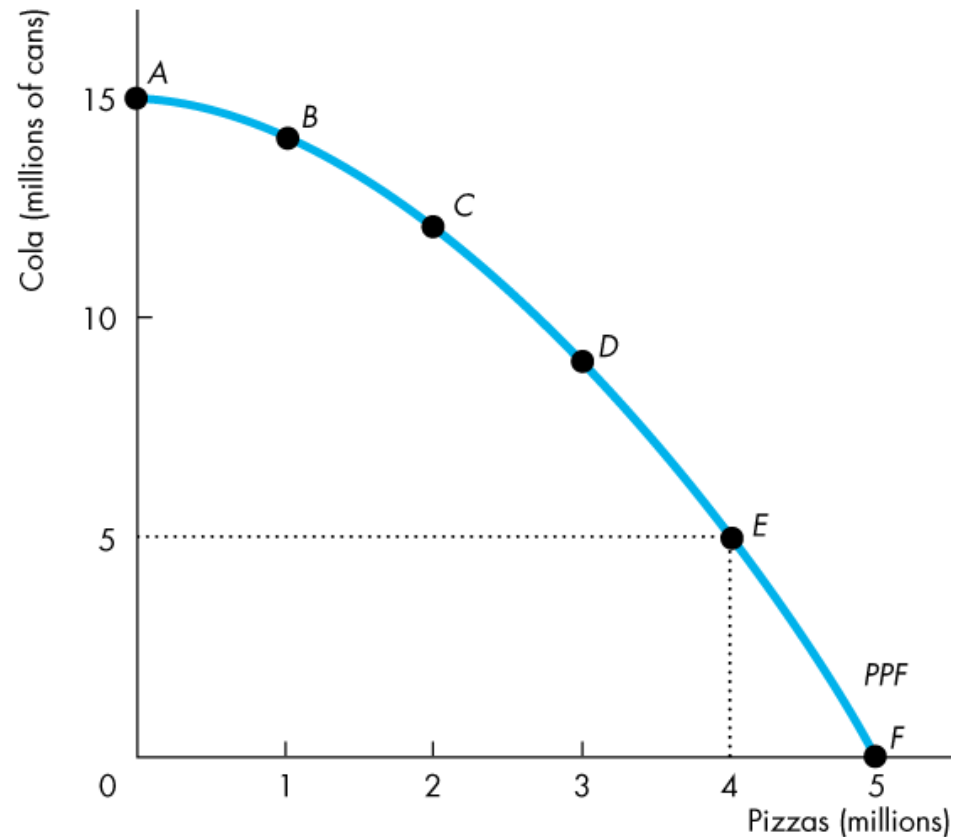


Production Possibilities and Opportunity Cost

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.



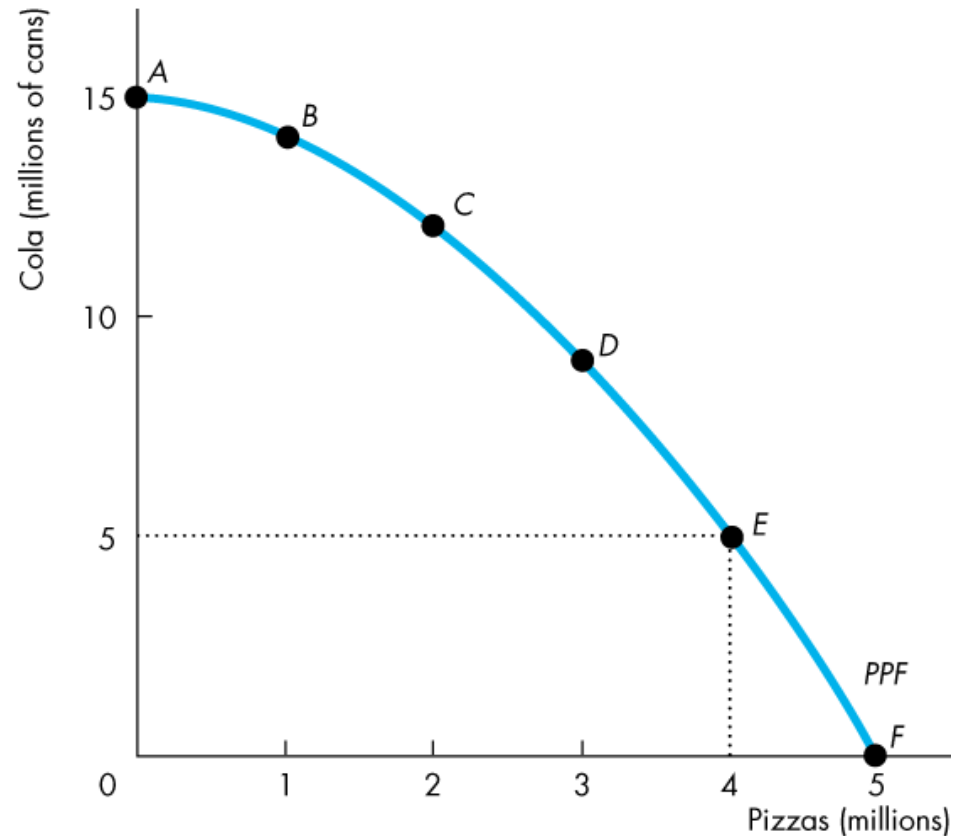
Production Possibilities and Opportunity Cost

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.



Production Possibilities and Opportunity Cost

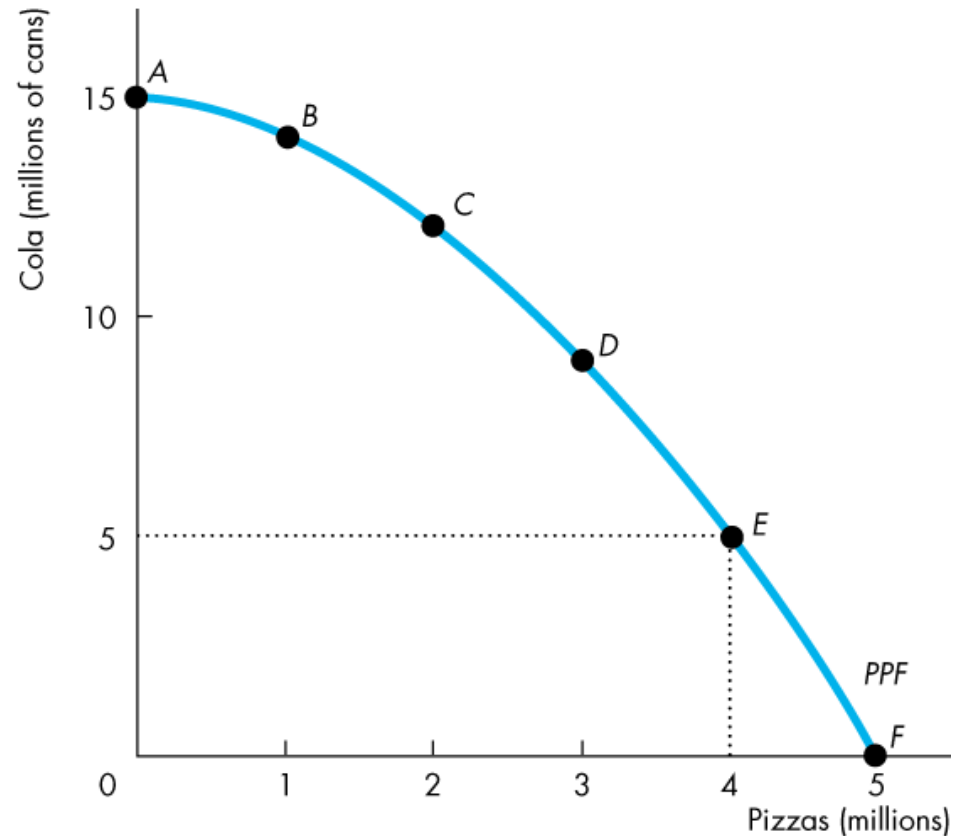
In moving from E to F :

The quantity of pizzas increases by 1 million.

The quantity of cola decreases by 5 million cans.

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

One of these pizzas costs 5 cans of cola.



Production Possibilities and Opportunity Cost

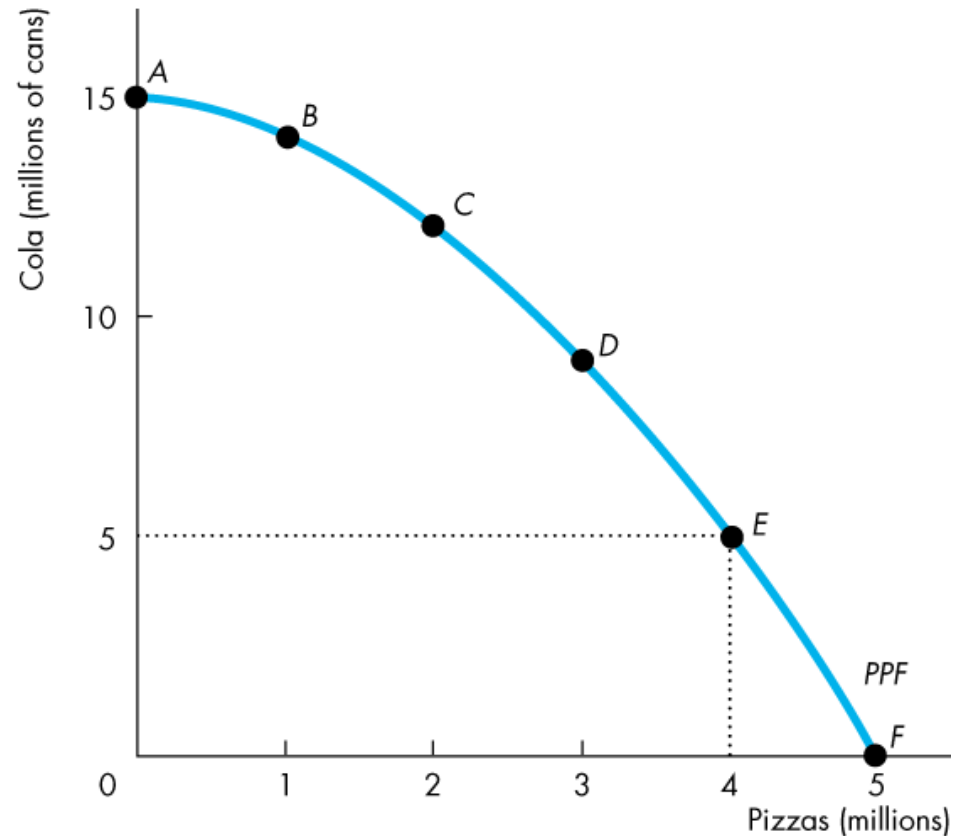
In moving from F to E :

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.



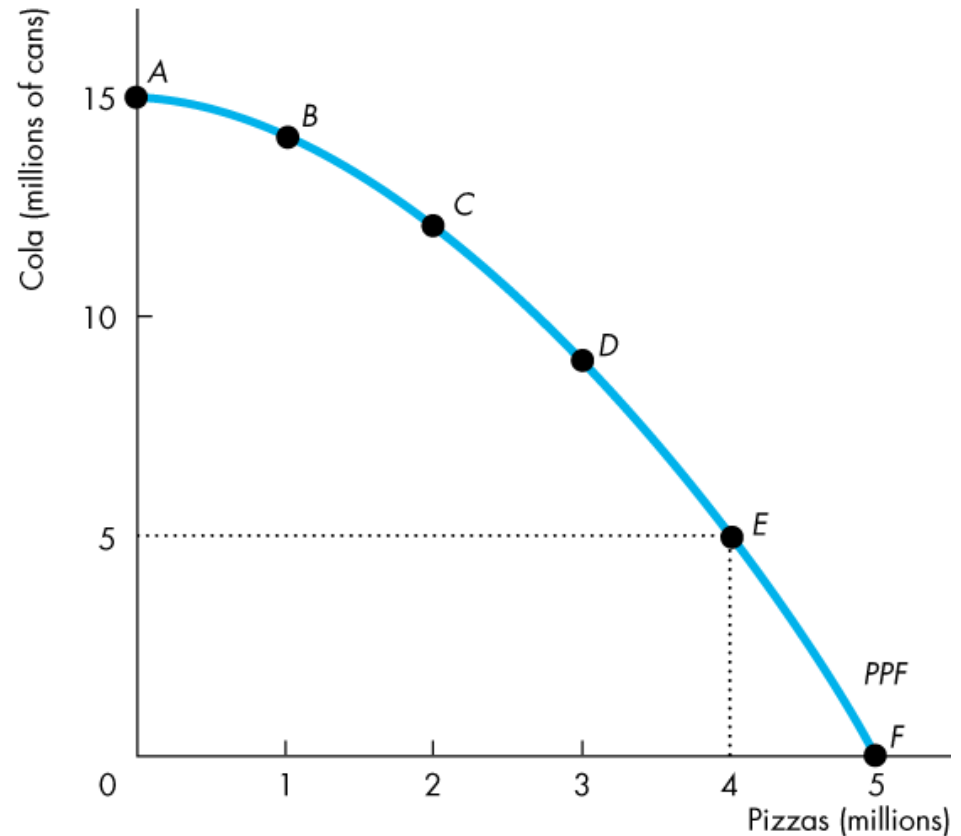
Production Possibilities and Opportunity Cost

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.

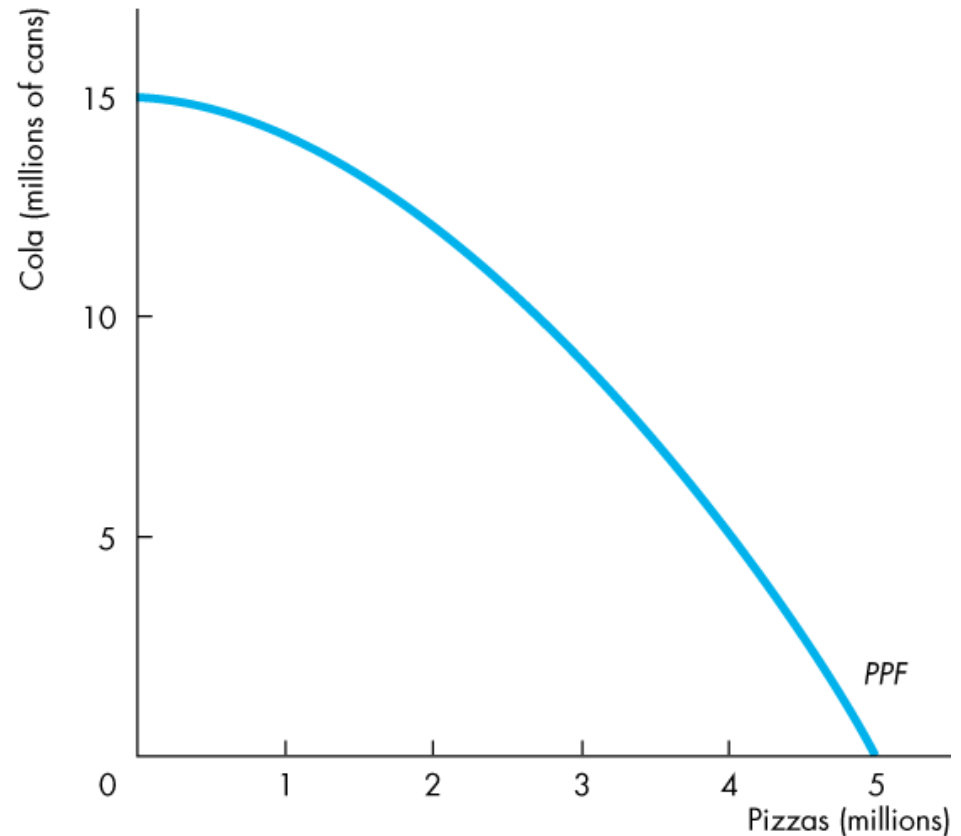


◆ Production Possibilities and Opportunity Cost

Increasing Opportunity Cost

Because resources are not equally productive in all activities, the *PPF* bows outward.

The outward bow of the *PPF* means that as the quantity produced of each good increases, so does its opportunity cost.



Economic Growth

The expansion 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*.

Economic Growth

The Cost of Economic Growth

To use resources in research and development and to produce new 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.

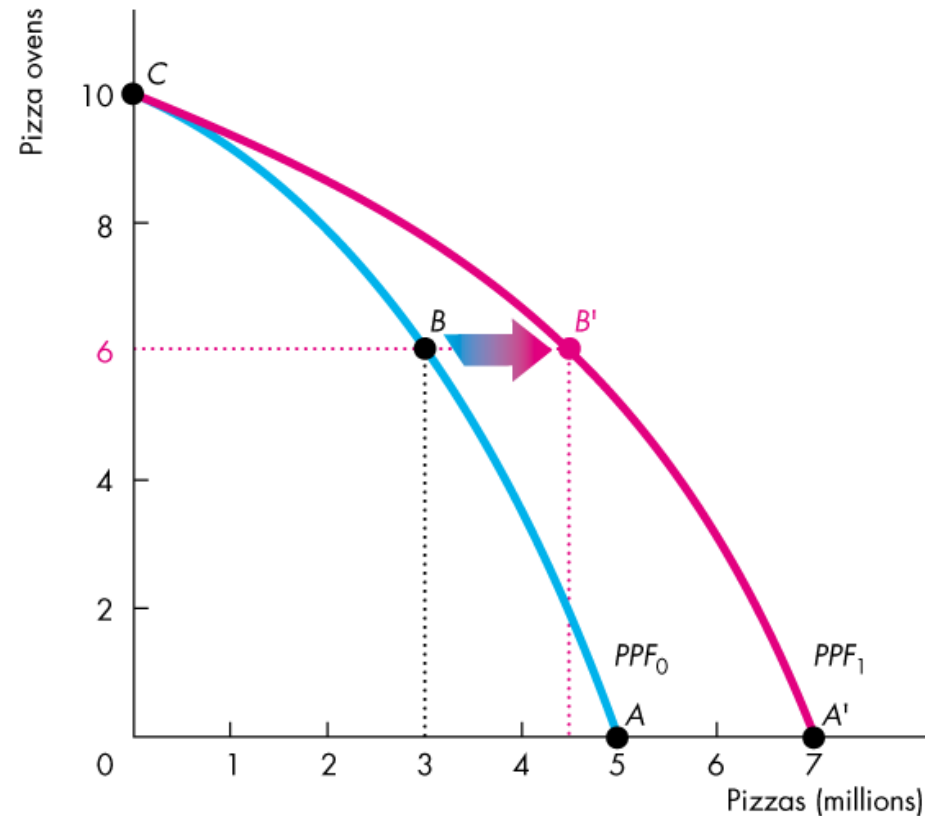
Economic Growth

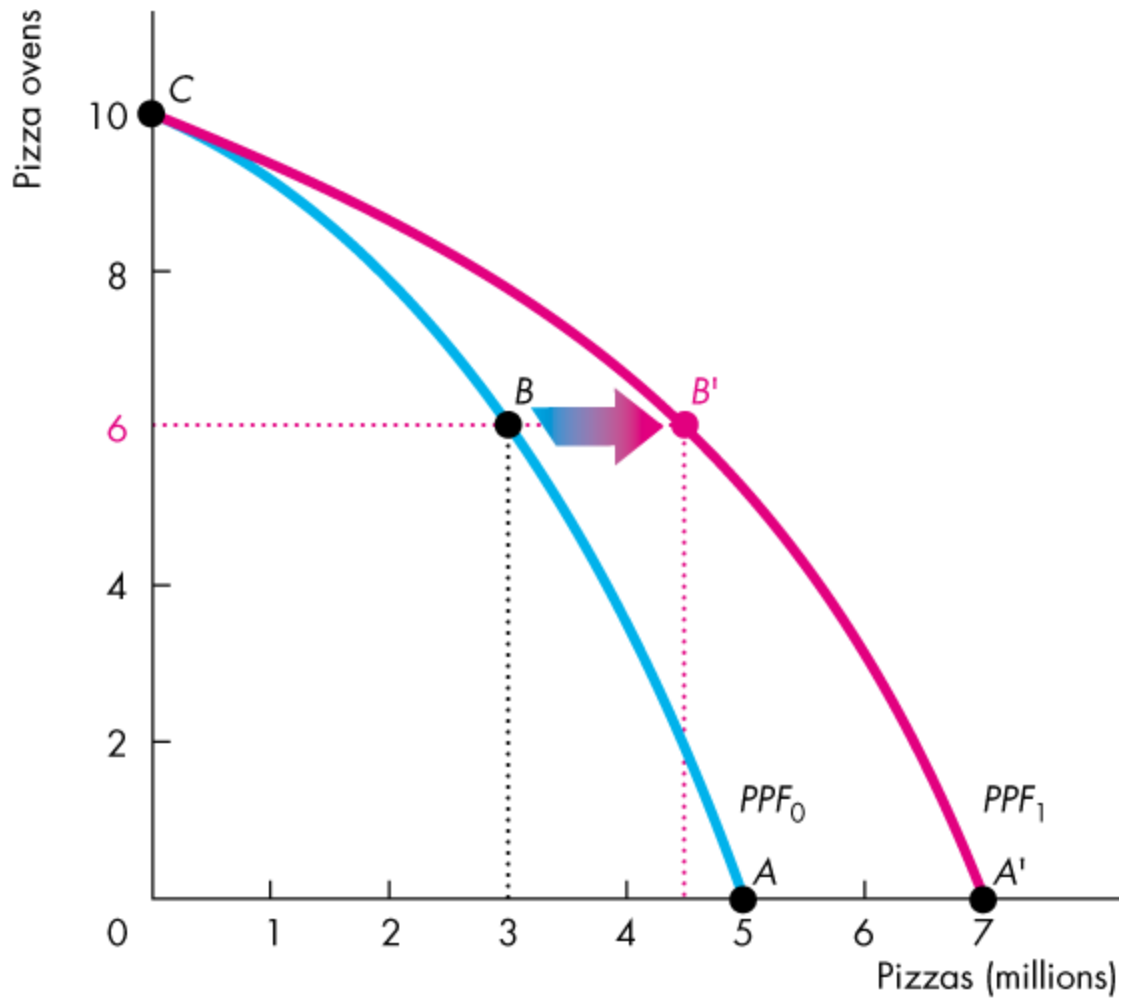


Figure 2.5 illustrates the tradeoff we face.

We can produce pizzas or pizza ovens along PPF_0 .

By using some resources to produce pizza ovens today, the PPF shifts outward in the future.





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.

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.

Let's look at Liz and Joe who operate smoothie bars.

◆ 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.

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

◆

◆ 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.

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.

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.

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



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 20 smoothies and 10 salads.

TABLE 2.3 Liz and Joe Gain from Trade

(a) Before trade	Liz	Joe
Smoothies	15	5
Salads	15	5
<hr/>		
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(d) After trade	Liz	Joe
Smoothies	20	10
Salads	20	10

◆ 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
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Smoothies	20	10
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(e) Gains from trade	Liz	Joe
Smoothies	+5	+5
Salads	+5	+5

Economic Coordination

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

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

- Firms
- Markets
- Property rights
- Money



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.

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.

