ECON 202 - MACROECONOMIC PRINCIPLES

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Chapter 2-4: Microeconomic Review

Topics - Micro Review

- What is Economics
- Apply the Principle of
  - Opportunity Cost
  - Marginal Principle
  - Voluntary Exchange
  - Diminishing Returns
  - Real-Nominal Principle
- Specialization and Trade
- Demand and Supply
- Market Equilibrium

What is Economics

- Economics is the study of the choices made by people when there is scarcity
- Scarcity is a situation in which resources are limited in quantity and can be used in different ways
- Without scarcity the problem of choice would be an easy one, just take everything, always!
- The decisions of producers, consumers and government determine how an economic system answers three fundamental questions:
  - What products do we produce?
  - How do we produce these products?
  - Who consumes the products?

Factors of Production

- The resources used for production are called factors of production:
- Natural resources
- Labor
- Physical capital
- Human capital
- Entrepreneurship

Factors of Production

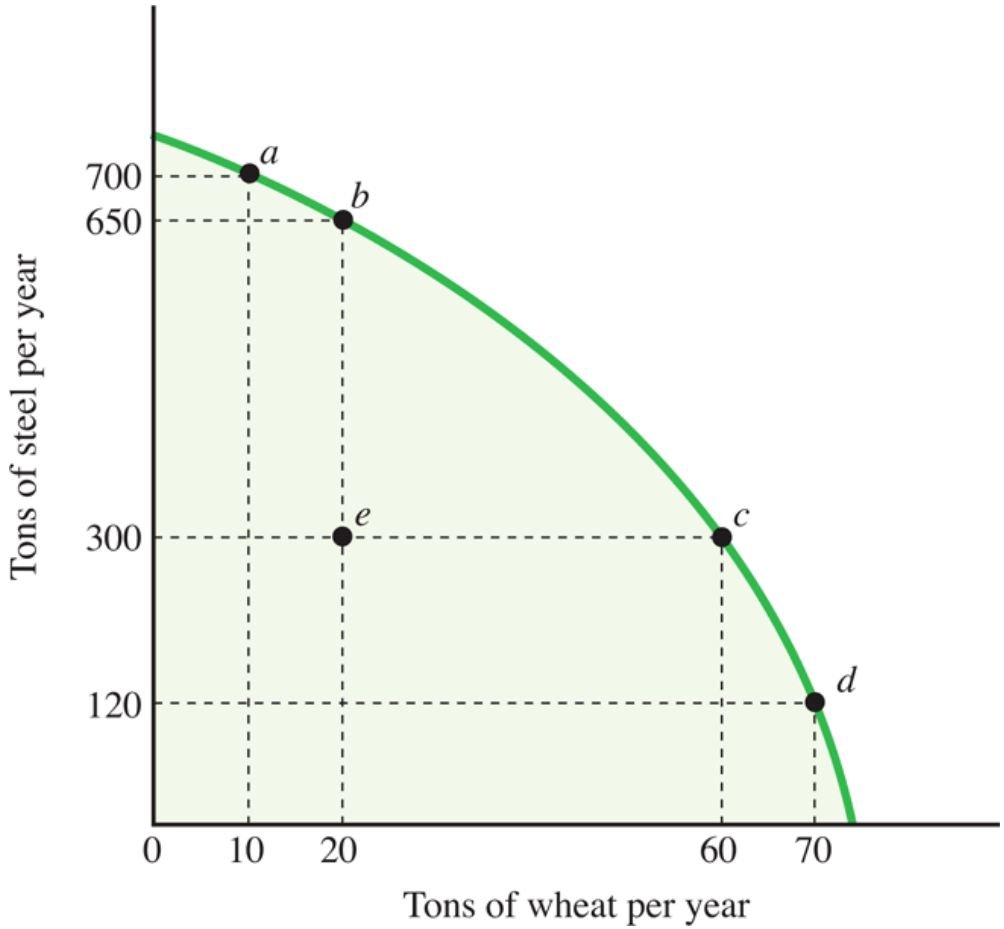
- Natural resources
  - The things created by acts of nature such as land, water, mineral, oil and gas deposits, renewable and nonrenewable resources
- Labor
  - The human effort, physical and mental, used by workers in the production of goods and services
- Physical capital
  - All the machines, buildings, equipment, roads and other objects made by human beings to produce goods and services
- Human capital
  - The knowledge and skills acquired by a worker through education and experience
- Entrepreneurship
  - The effort to coordinate the production and sale of goods and services. Entrepreneurs take risk and commit time and money to a business without any guarantee of profit

Production Possibility Frontier

First Model: Production Possibility Frontier (PPF)

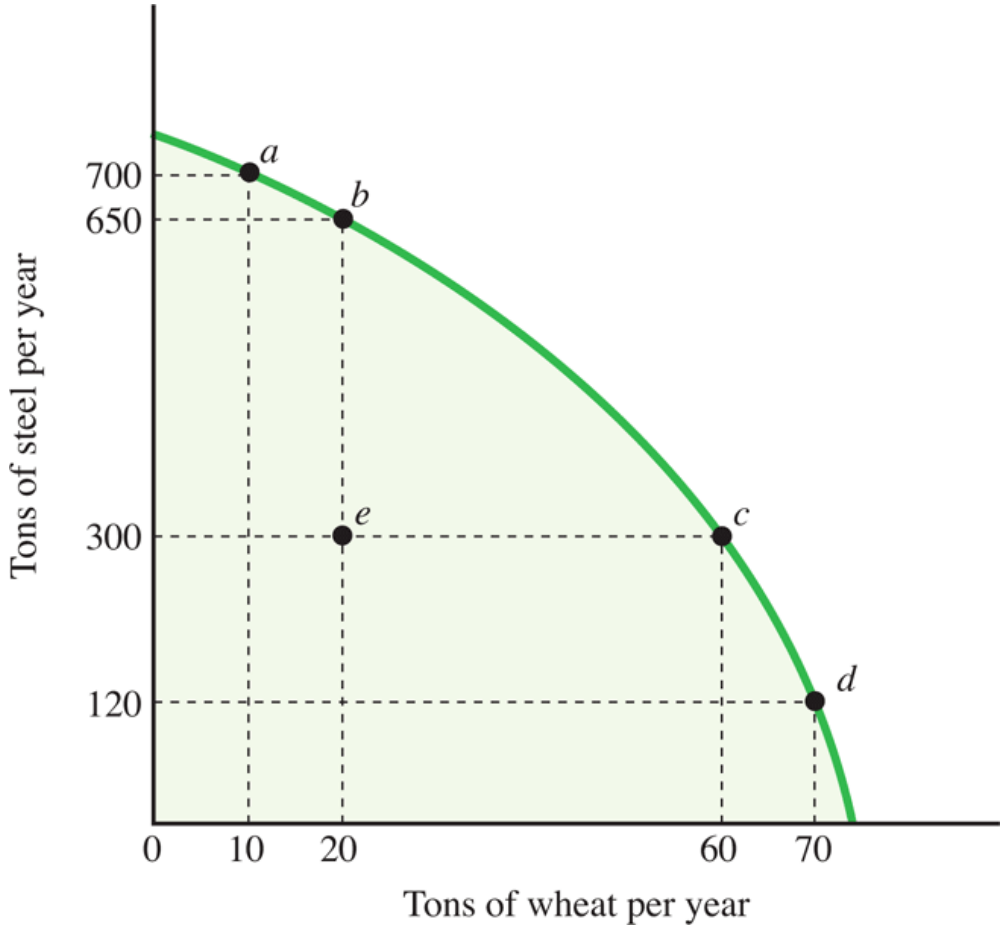
- Describes the combinations of products that are possible (to be produced) given resources and technological know-how
- Shows the production options
- An economy should always produce "on the curve" $\rightarrow$ feasible and efficient

PPF



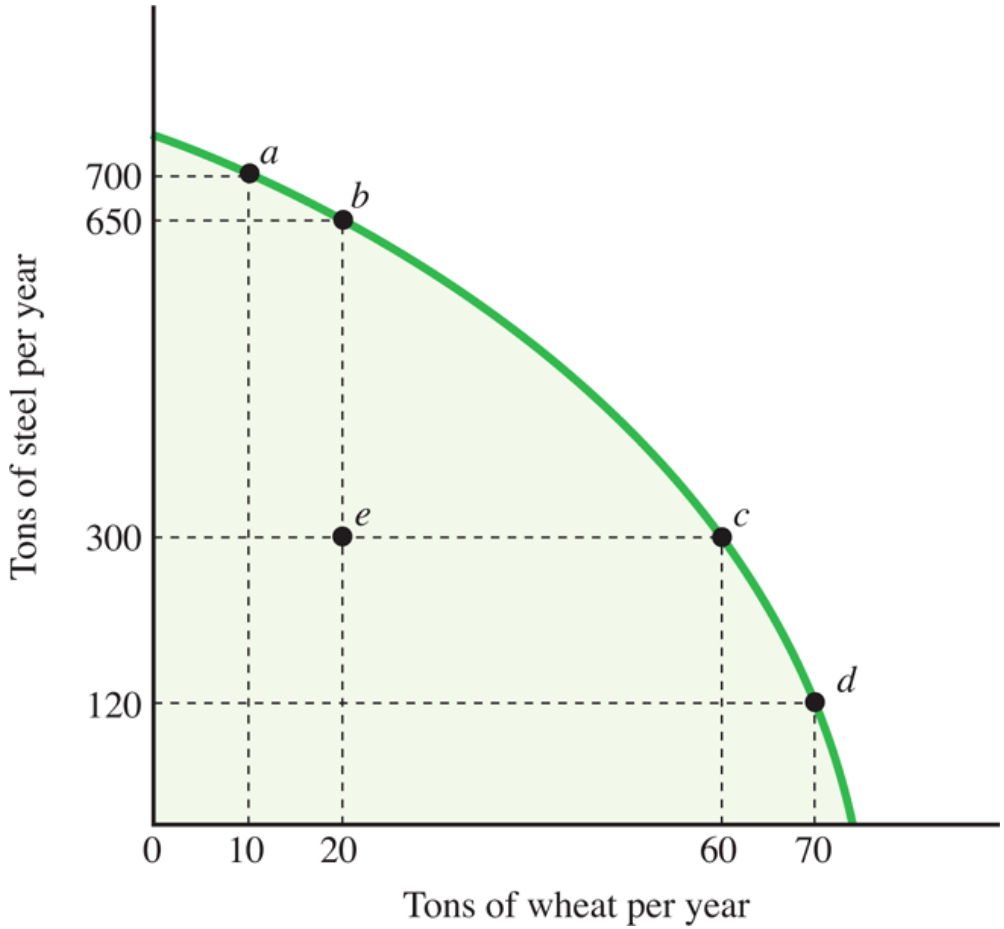
- A curve that shows the possible combinations of products that an economy can produce
- Productive resources are fully employed and efficiently used

PPF



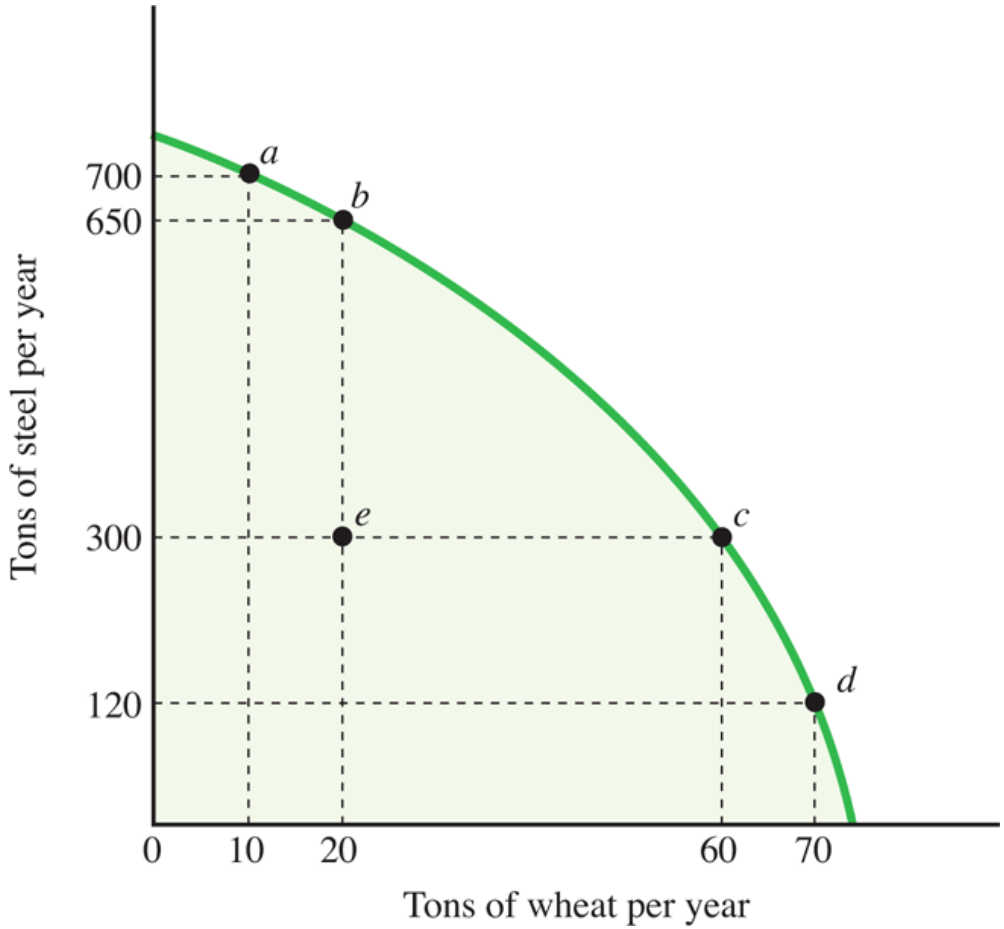
- When the economy is at point e, resources are not fully employed and/or they are not used efficiently

PPF



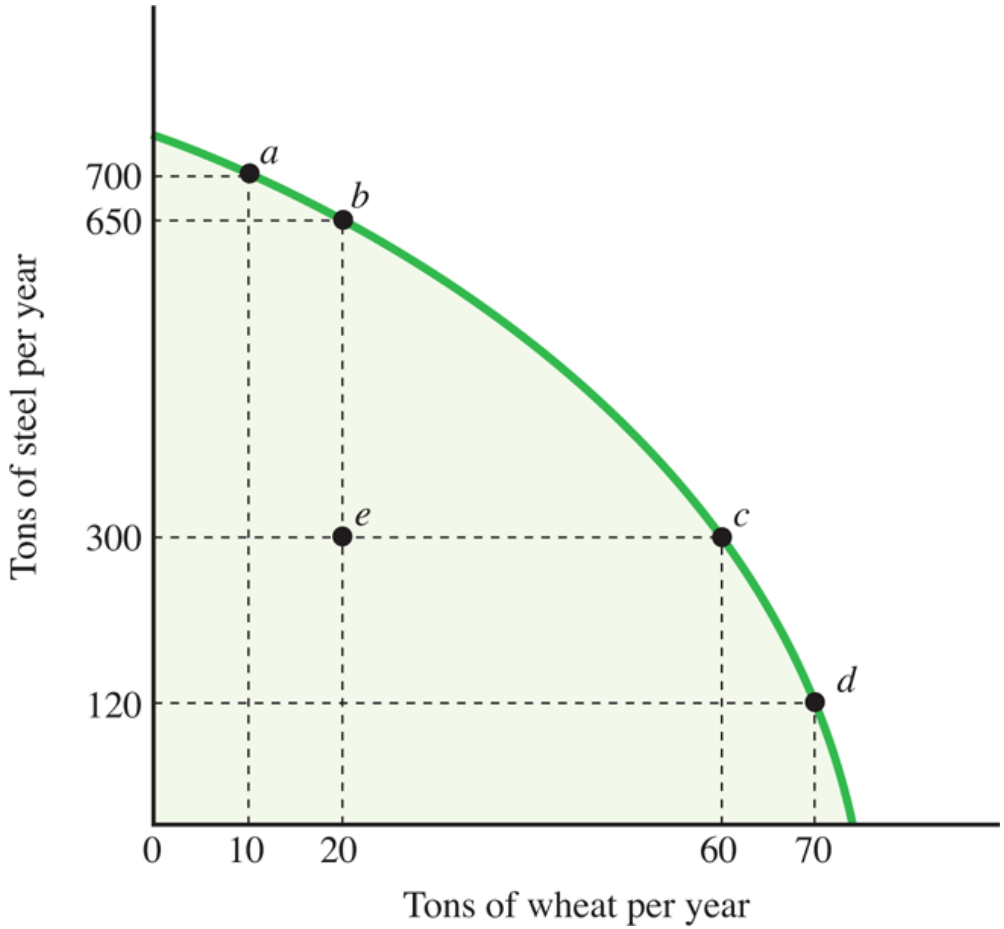
- A Point to the right of the green curve is desirable because it yields more of both goods
- But it is not attainable given the amount of resources available

PPF



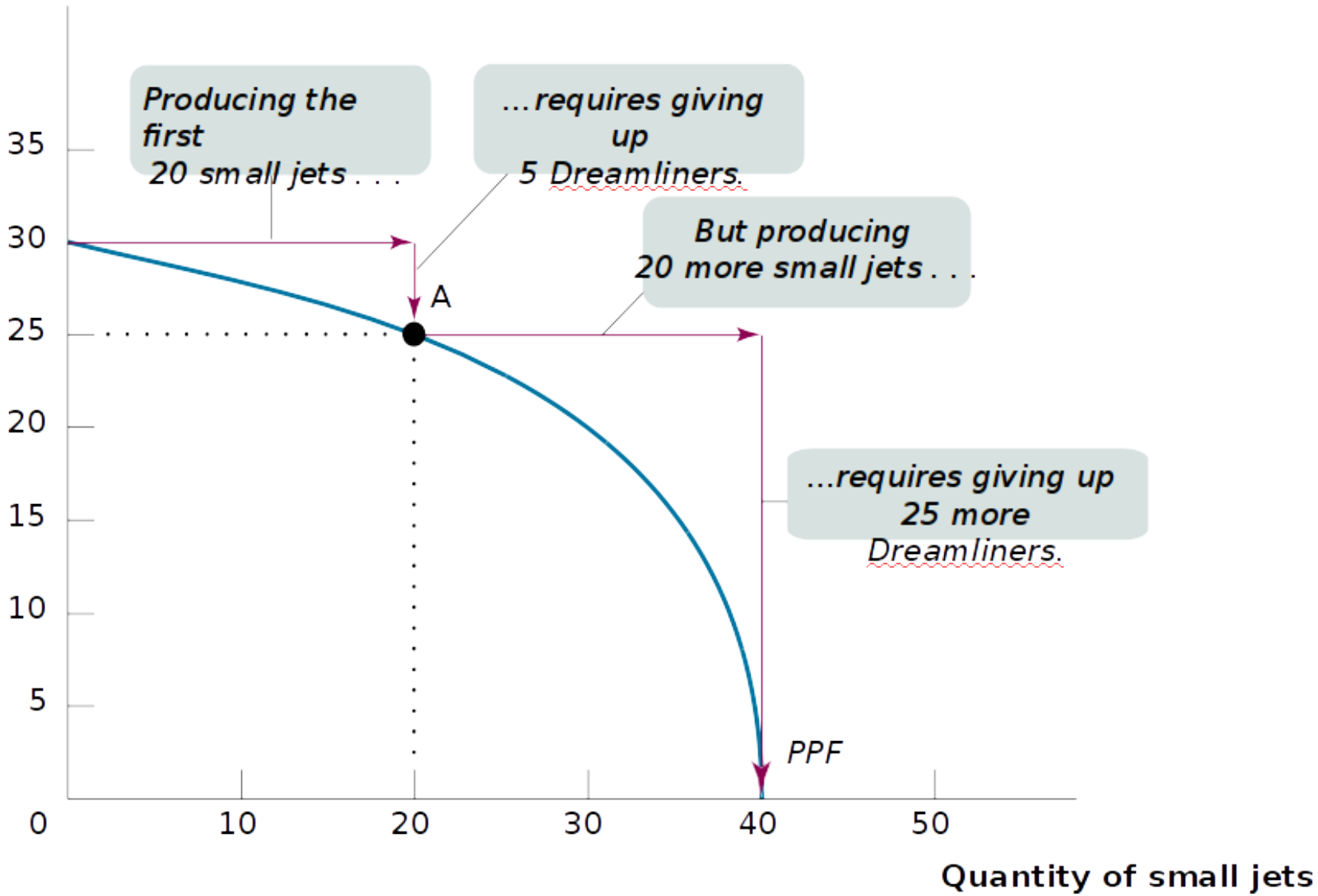
- To increase the amount of farm goods by 40 tons, we must sacrifice 350 tons of factory goods: move from $b \rightarrow c$

PPF

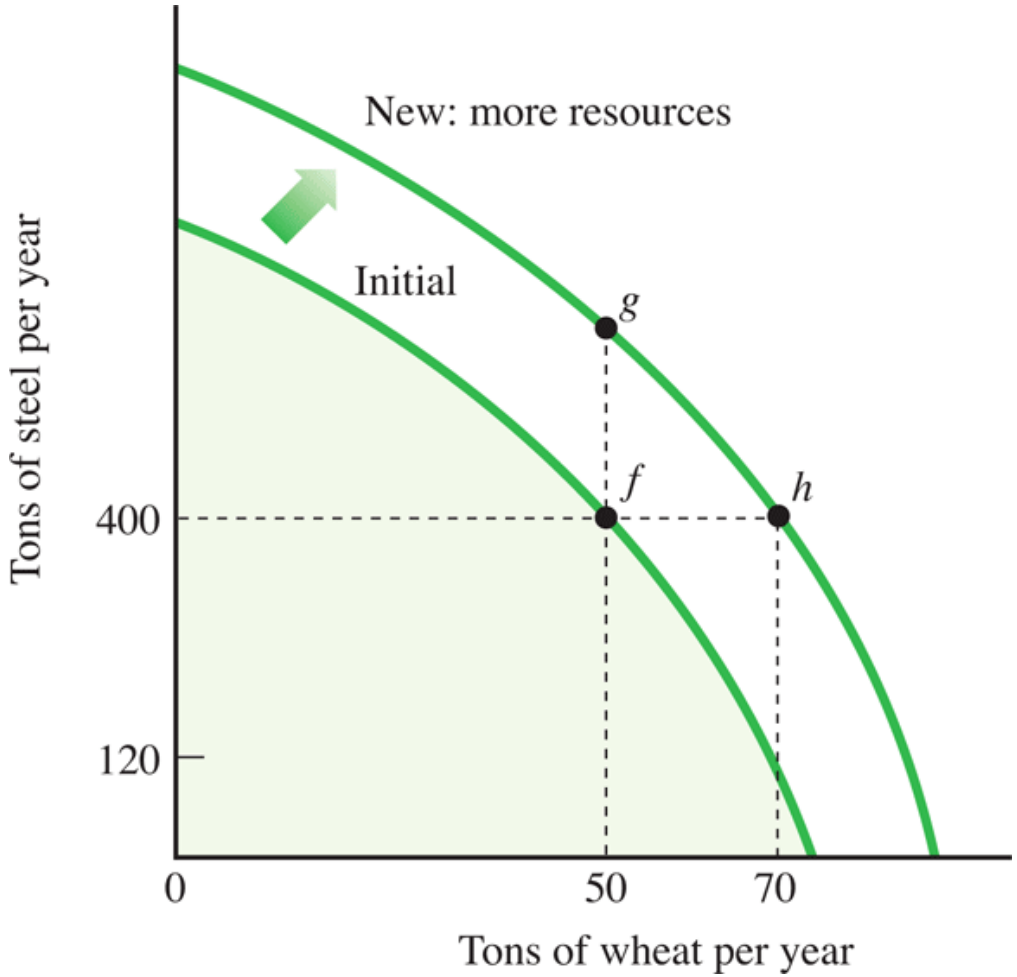


- The PPF curve is bowed out because resources are not perfectly adaptable to the production of the two goods $\rightarrow$As we increase the production of one good, we sacrifice progressively more of the other

Increasing Opportunity Cost



Expansion of PPF



- An increase in the quantity of resources or technological innovation in an economy shifts the production possibilities curve outward

Basic Principles

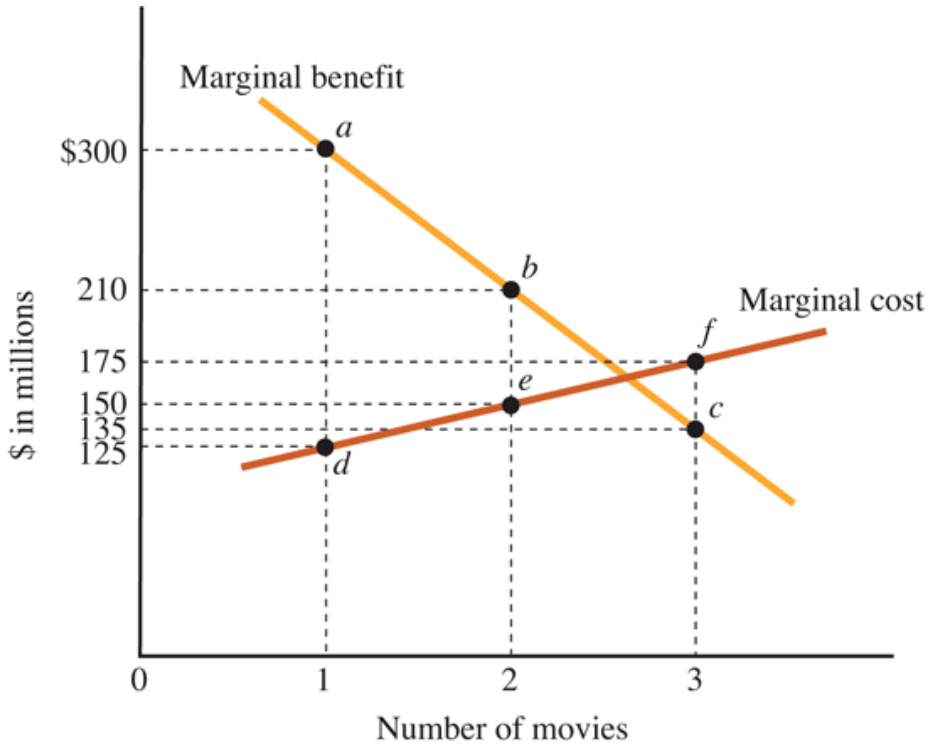
Opportunity Cost Principle

- The opportunity cost of something is what you sacrifice to get it
- You calculate the opportunity cost of something by picking the best alternative to it
- The principle of opportunity cost also explains why the production possibilities frontier is negatively sloped
- Examples:
  - What is the opportunity cost of military spending?
  - What is the opportunity cost of a college degree?

Marginal Principle

- A small change in one variable is called a marginal change. We denote marginal changes is say, variable y, as: Δy (delta y) or y'
- Marginal Benefit (MB): is the extra benefit resulting from small (one unit) increase in an activity
- Marginal Cost (MC): is the extra cost resulting from a small (one unit) increase in an activity
- Increase the level of an activity if marginal benefit is larger than marginal cost
- Does a one unit increase of something make us better off? If yes, do it

Marginal Principle



Number of Movies	Marginal Benefit ($ millions)	Marginal Cost ($ millions)
1	$300	$125
2	210	150
3	135	175

Principle of Diminishing Returns

Example:

- 1 copy machine and 1 worker produce 1000 pages
- 1 copy machine and 2 workers produce how many pages?
- 1 copy machine and 100 workers produce how many pages?
- As we increase the number of workers and hold the number of copy machines constant output per additional worker decreases

Principle of Voluntary Exchange

- A voluntary exchange between two people makes both people better off

Percentage Change

- Percentage change $= \left(\frac{\text{absolute change}}{\text{initial value}} \right) \times 100$
- $\%\Delta = \frac{(new - old)}{old} \times 100$

Real vs. Nominal

- Nominal value
  - The face value of an amount of money
- Real value
  - The value of an amount of money in terms of what it can buy
- Example:
  - Government officials use the real-nominal principle when they design public programs.
  - Social Security payments indexed to inflation Published statistics are adjusted for inflation

Example of Real vs Nominal

TABLE 2.2 The Real Value of the Minimum Wage, 1974–2011

	1974	2011
Minimum wage per hour	$ 2.00	$ 7.25
Weekly income from minimum wage	80	290
Cost of a standard basket of goods	47	225
Number of baskets per week	1.70	1.29

- Because prices increased faster than the nominal wage
- the real value of the minimum wage actually decreased over this period

Markets

Markets

- A market is an arrangement that allows buyers and sellers to exchange things $\rightarrow$ trading what they have for what they want
- Markets determine the price of goods and services purely by bringing together people who act in their self interest
- The invisible hand (Adam Smith, 1776, The Wealth of Nations)
  - "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages. [Man is] led by an invisible hand to promote an end which was not part of his intention .... By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it."

Specialization and Comparative Advantage

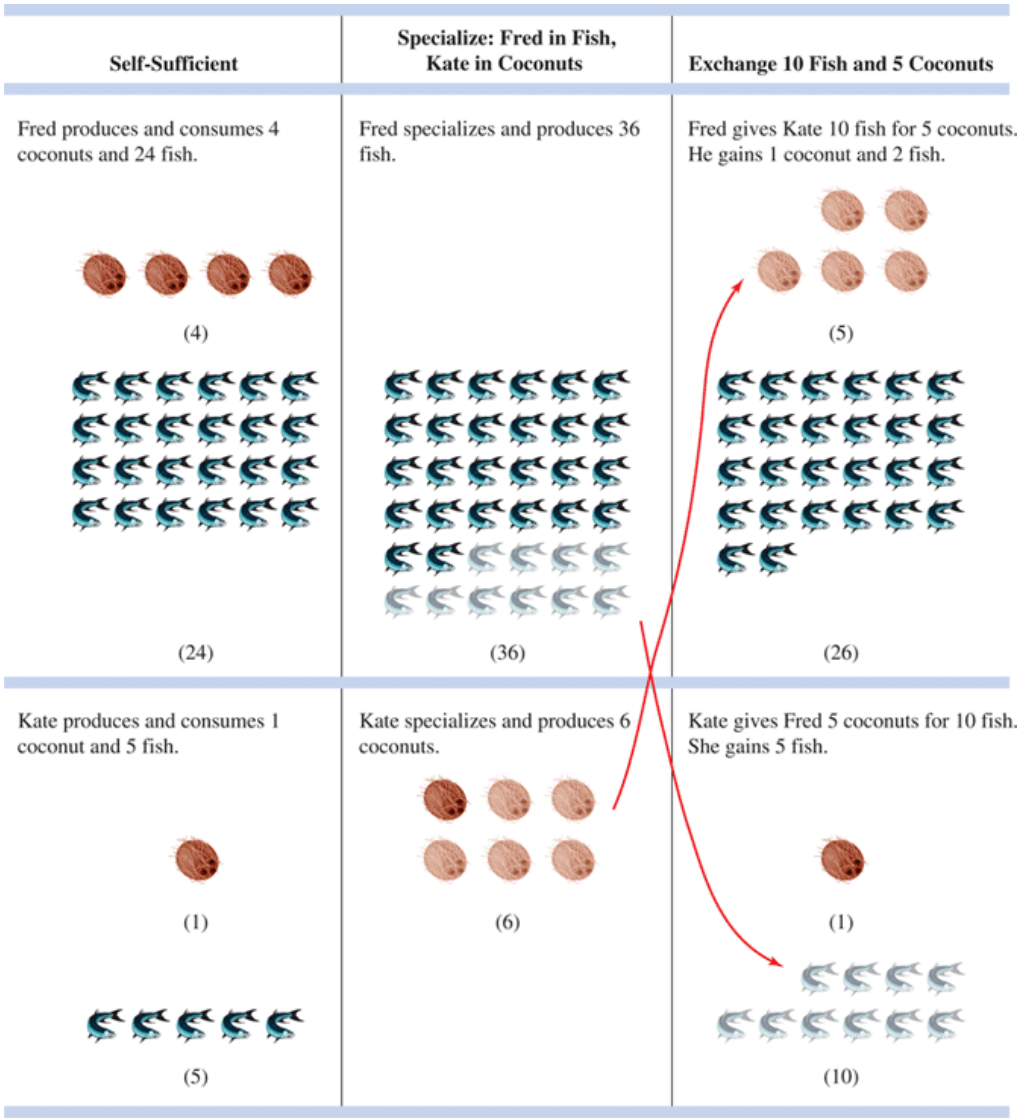
TABLE 3.1 Productivity and Opportunity Costs

	Fred		Kate	
	Coconuts	*Fish*	*Coconuts*	*Fish*
Output per day	2	6	1	1
Opportunity cost	3 fish	1/3 coconut	1 fish	1 coconu

Comparative Advantage vs Absolute Advantage with Weekly Output

- Comparative Advantage
  - The ability of one person or nation to produce a good at a lower opportunity cost than another person or nation
    - Fred has a comparative advantage in producing fish
    - His opportunity cost of fish is one-third coconut per fish, compared to 1 coconut per fish for Kate
    - Kate has a comparative advantage in coconuts
    - Her opportunity cost of coconuts is 1 fish per coconut, compared to 3 fish per coconut for Fred
- Absolute advantage
  - The ability of one person or nation to produce a product at a lower resource cost than another person or nation
    - Fred as an absolute advantage over Kate

Gains from Voluntary Trade



Efficiency Idea of Market Economies

- Competitive markets are (Pareto-)efficient
- Positive economics answers the questions:
  - What is or
  - What will be?
- Normative economics answers the question:
  - What ought to be?

Specialization

- In his 1776 book, An Inquiry into the Nature and Causes of the Wealth of Nations, Adam Smith noted that specialization actually increased productivity through the division of labor
- Smith listed three reasons for productivity to increase with specialization, with each worker performing a single production task:
  1. Repetition
     - The more times a worker performs a particular task, the more proficient the worker becomes at that task
  2. Continuity
     - A specialized worker doesn't spend time switching from one task to another
     - This is especially important if switching tasks requires a change in tools or location.
  3. Innovation.
     - A specialized worker gains insights into a particular task that lead to better production methods

Entrepreneurs

- Entrepreneurs play a key role in a market economy
- Prices and profits provide signals to entrepreneurs about what to produce
- If a product becomes popular, competition among consumers to obtain it will increase its price and increase the profits earned by firms producing it
- Entrepreneurs will enter the market and increase production to meet the higher demand, switching resources from the production of other products
- As entrepreneurs enter the market, they compete for customers, driving the price back down to the level that generates just enough profit for them to remain in business

Market Failure

- Market failure happens when a market doesn't generate the most efficient outcome
- There are several sources of market failure and possible responses by government. Here is a preview of the topics:
  - Externalities (e.g., Pollution, secondhand smoke, scientific discovery)
  - Public goods (non-rival, non-excludability $\rightarrow$ national defense, clean air, public park)
  - Imperfect information (e.g., car quality in used car markets)
  - Imperfect competition (e.g., Monopoly)

Market Failures

- A cost or benefit by people who are external to the decision about how much of a good to produce or consume (externalities)
- Unregulated markets often make decisions disregarding externalities $\rightarrow$ results in either too much or too little production
- Gov't intervention can help in such cases

Government and Markets

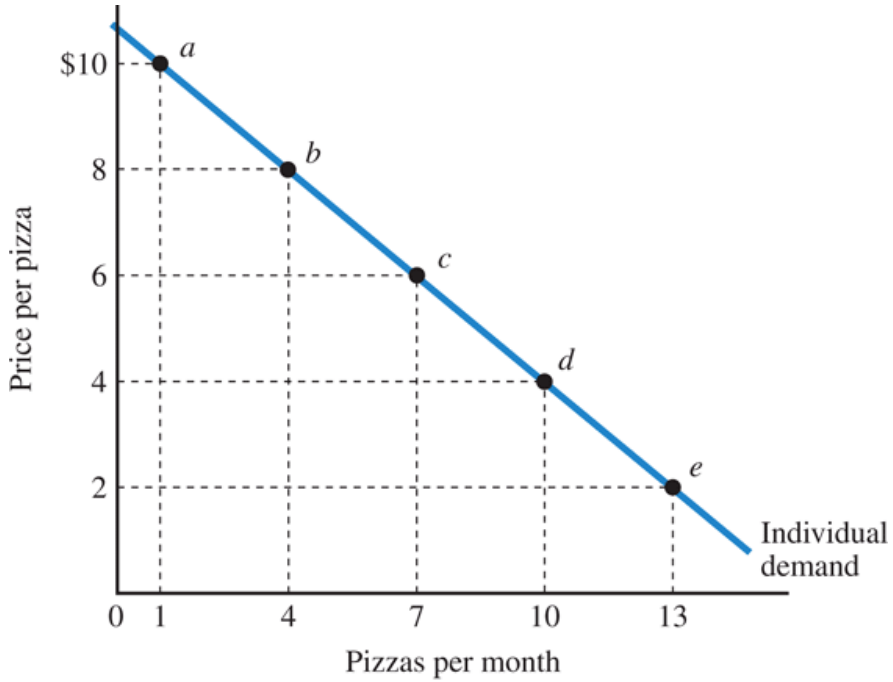
- To facilitate exchange, the government helps to enforce contracts by maintaining a legal system that punishes people who violate them.
- This system allows people to trade with the confidence that the terms of the contracts they enter will be met.
- In the case of consumer goods, the implicit contract is that the product is safe to use. The government enforces this implicit contract through product liability or tort law.
- The government disseminates information about consumer products.
- The government uses antitrust policy to foster competition
- Given the uncertainty of market economies, most governments fund a "social safety net" that provides for citizens who fare poorly in markets
  - Of course, there are private responses to economic uncertainty. For example, we can buy our own insurance to cover losses
  - Some types of insurance, however, are unavailable in the private insurance market. As a result, the government steps in to fill the void

Demand - Supply

Graphs

- To illustrate relationships between variables.
  - Make sure you understand how to draw a positive and negative relationship between two variables in a 2-dimensional graph
  - Computing the slope of a curve
  - Slope=vertical difference between 2 points/horizontal difference between the 2 points
  - Intercept
- Examples
  - Positive/negative relation between x and y
  - positive non-linear relation (decreasing returns)
  - positive non-linear relation (increasing returns)

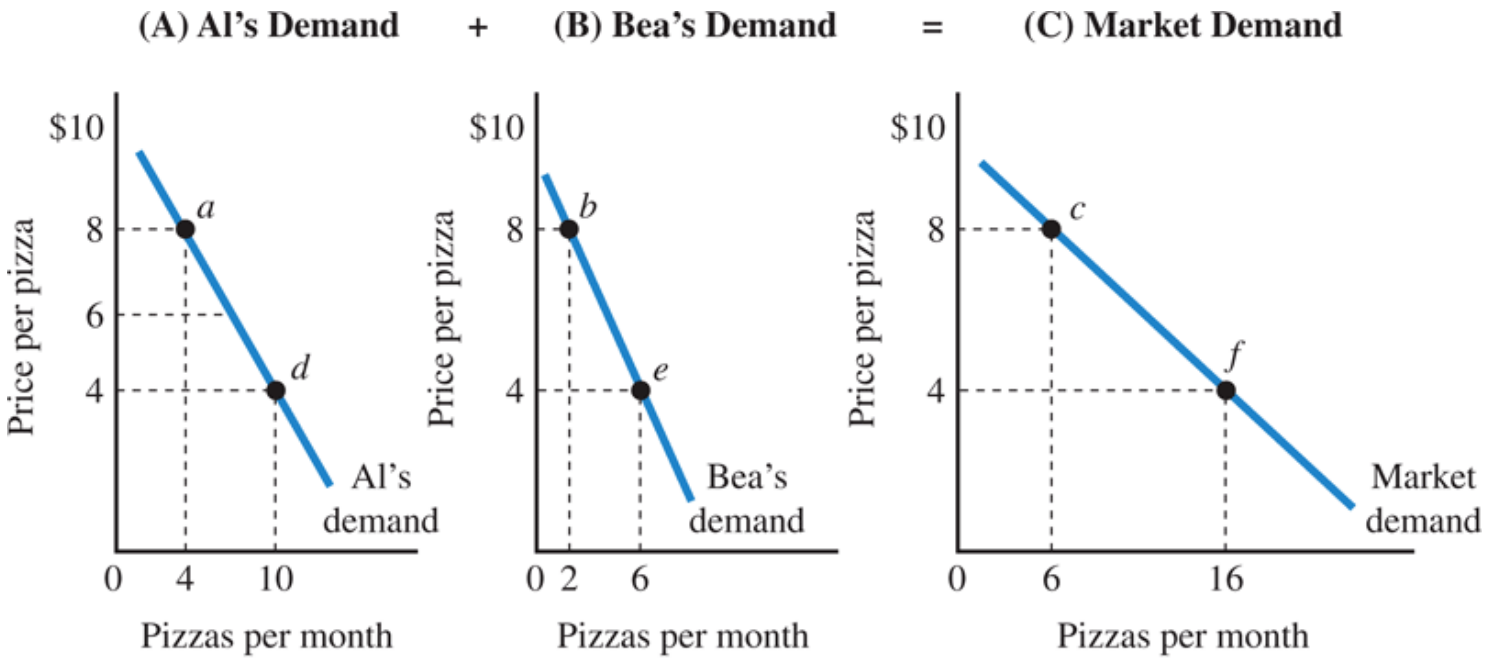
Consumer Demand



AL'S DEMAND SCHEDULE FOR PIZZAS

Point	Price	Quantity of Pizzas per Month
a	$10	1
b	8	4
c	6	7
d	4	10
e	2	13

Individual and Aggregate Demand



QUANTITY OF PIZZA DEMANDED			
Price	Al +	Bea =	Market Demand
$8	4	2	6
6	7	4	11
4	10	6	16
2	13	8	21

Demand Shifters

What affects consumer demand?

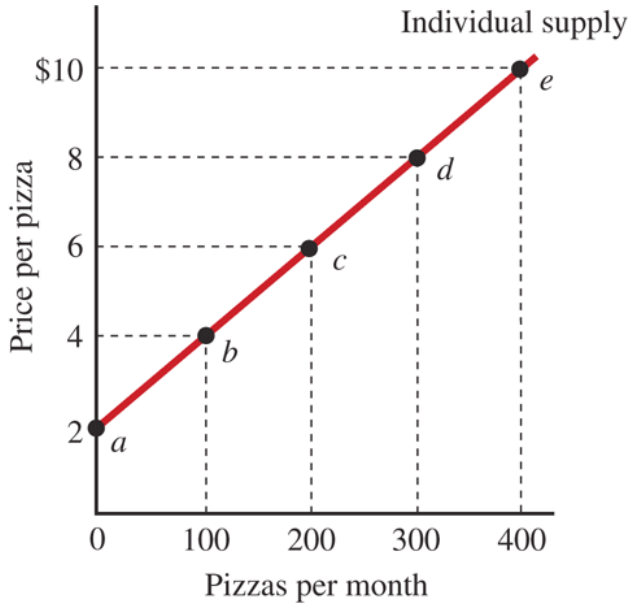
1. Price of the product
2. Consumer income
3. Price of substitute goods
4. Price of complementary goods
5. Consumer tastes and advertising
6. Consumer expectations about future prices

- Item 2 to 6 are held constant in the demand schedule
- Holding 2-6 constant the demand curve is downward sloping
- That is, as prices increase, demand goes down.

Prices Changes

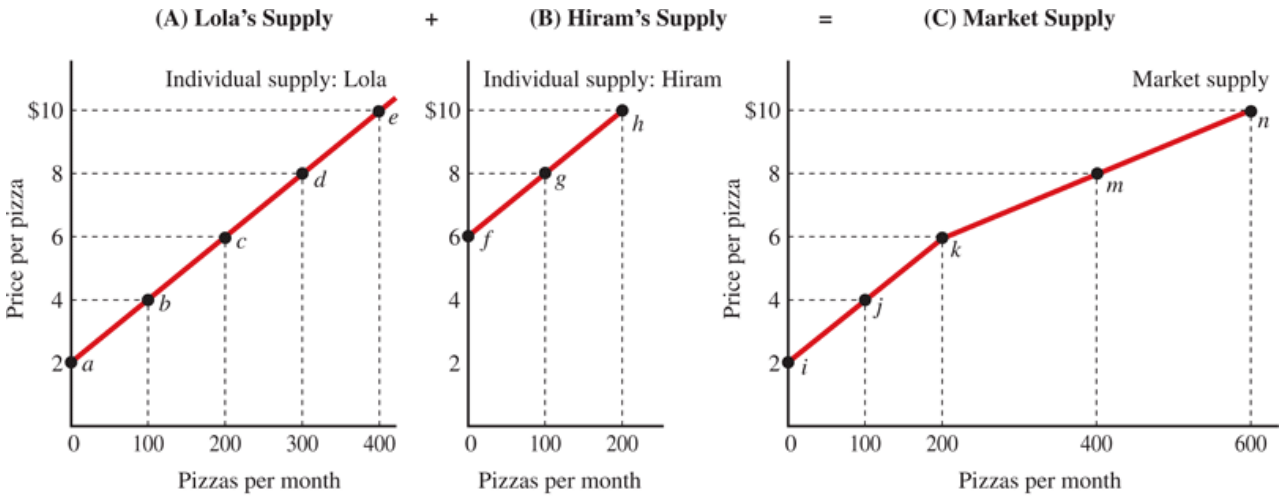
- Income effect
- Substitution effect

Supply Curve



INDIVIDUAL SUPPLY SCHEDULE FOR PIZZA		
Point	Price	Quantity of Pizzas per Month
a	$2	0
b	4	100
c	6	200
d	8	300
e	10	400

Aggregate Supply



QUANTITY OF PIZZA SUPPLIED			
Price	Lola +	Hiram =	Market Supply
2	0	0	0
4	100	0	100
6	200	0	200
8	300	100	400
10	400	200	600

Supply

Sellers decisions are influenced by

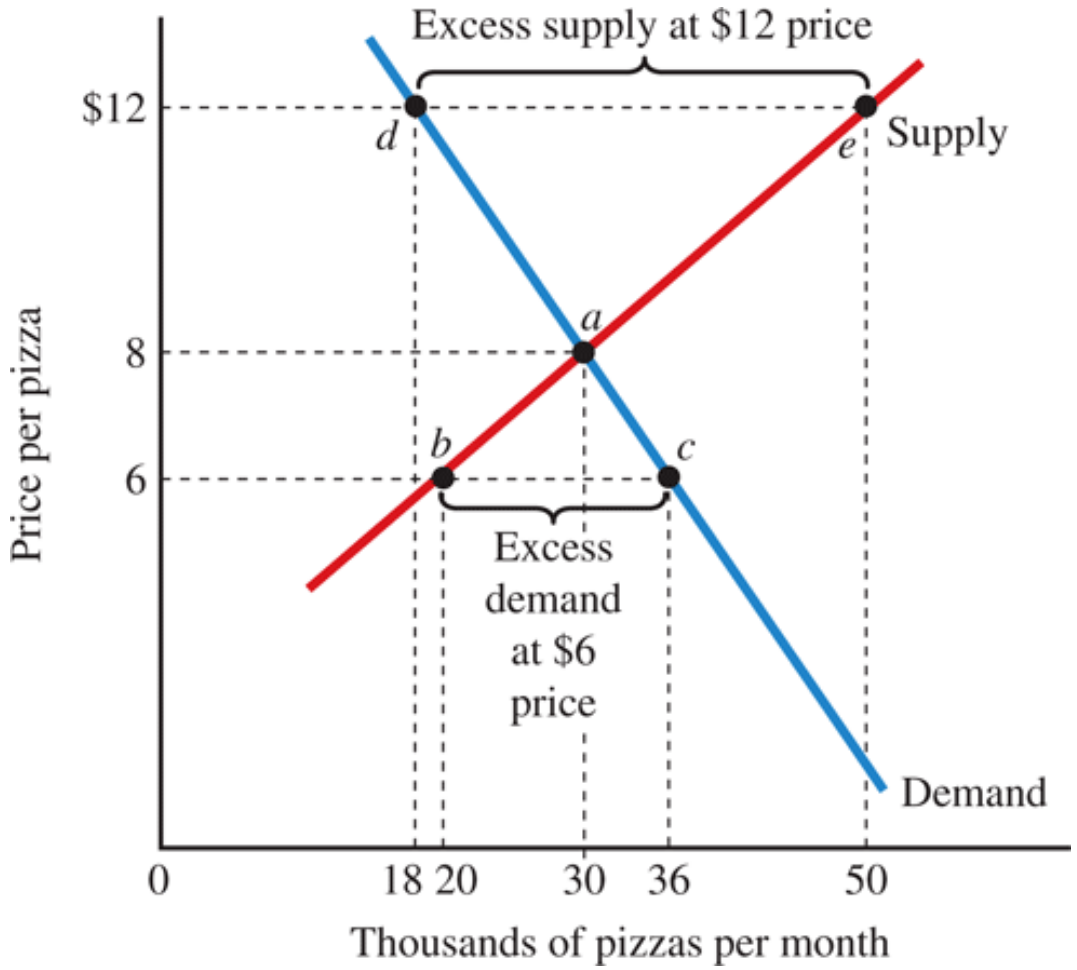
1. Price of the product
2. Cost of the inputs used in production (e.g. wages, cost of electricity, etc.)
3. State of production technology
4. Number of producers in the market
5. Producer expectation about future prices
6. Taxes or subsidies from the government.

Market Equilibrium

Market Equilibrium

- When the quantity of the product supplied equals the quantity of the product demanded, this is called a market equilibrium. In equilibrium there is no pressure to change the price.
- Excess demand causes prices to rise.
  - Consumers are willing to buy more than producers are willing to sell.
  - Firms will increase the selling price for their limited supply of pizza and
  - Anxious consumers will pay the higher price to get one of the rare products

Market Equilibrium



Price Increase

- As prices increase two things will happen,
- Fewer goods are demanded as the market moves upward on the demand curve
- More goods are supplied as the market moves up the supply curve
- Hence the gap between quantity demanded and supplied narrows.
- Price continuous to rise until excess demand is eliminated

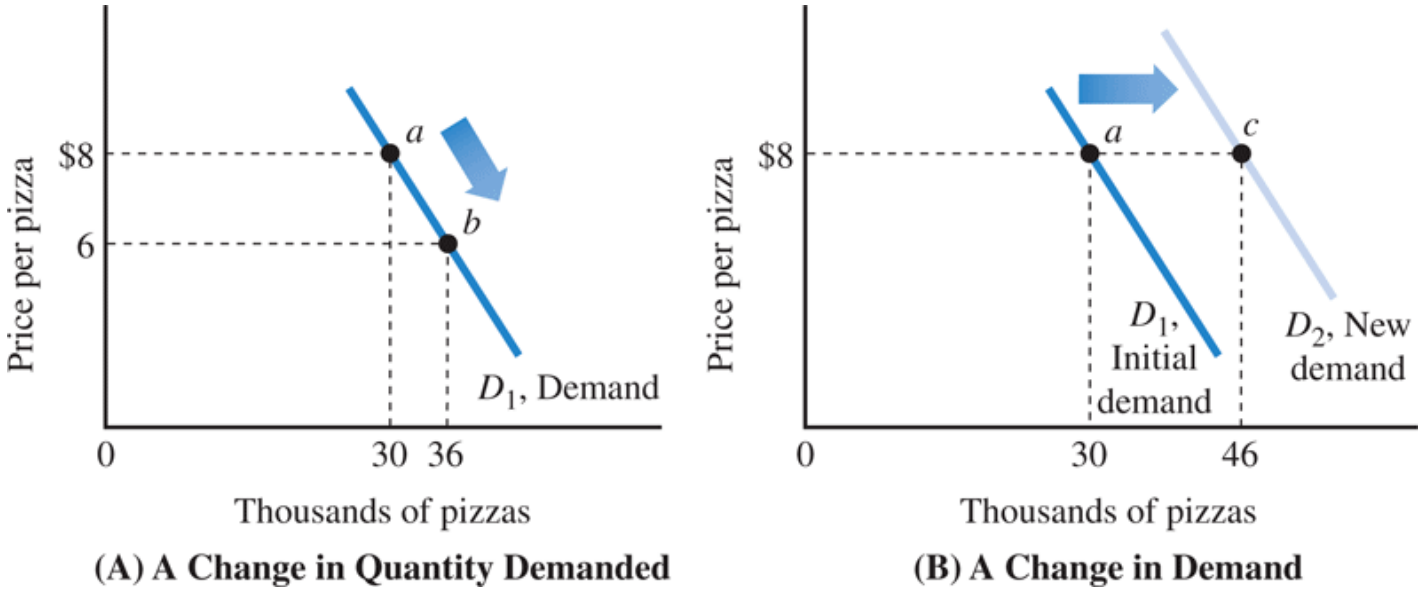
Excess Supply

- Excess supply causes prices to drop
- Producers are willing to sell more than consumers are willing to buy
- To sell the extra goods firms lower prices
- The market moves downward along the demand curve as prices drop
- The market moves downward on the supply curve

Market Effects of Demand Changes

- What shifts the demand curve to the right?
  1. Income increase (given it is a normal good)
  2. Increase in price of a substitute good
  3. Decrease in price of a complementary good
  4. Increase in population
  5. Shift in consumer tastes
  6. Favorable advertising
  7. Expectations of higher future prices
- The effect is an excess demand $\rightarrow$ prices go up

Change in Price vs Change in Demand



(A) A Change in Quantity Demanded **(B) A Change in Demand**

Change in Price vs Change in Demand

- A change in price causes a change in quantity demanded, a movement along a single demand curve
  - For example, a decrease in price causes a move from point a to point b, increasing the quantity demanded
- A change in demand caused by changes in a variable other than the price of the good shifts the entire demand curve
  - For example, an increase in demand shifts the demand curve from D1 to D2

Types of Goods

- Normal Good
  - A good for which an increase in income increases demand.
- Inferior Good
  - A good for which an increase in income decreases demand. Goods with a more expensive alternative.
  - E.g. margarine and butter. If you have a higher income you might switch to the better quality product $\rightarrow$demand for margarine $\downarrow$ as your income $\uparrow$
- Substitutes
  - Two goods for which an increase in the price of one good increases the demand for the other good
- Complements
  - Two goods for which a decrease in the price of one good increases the demand for the other good

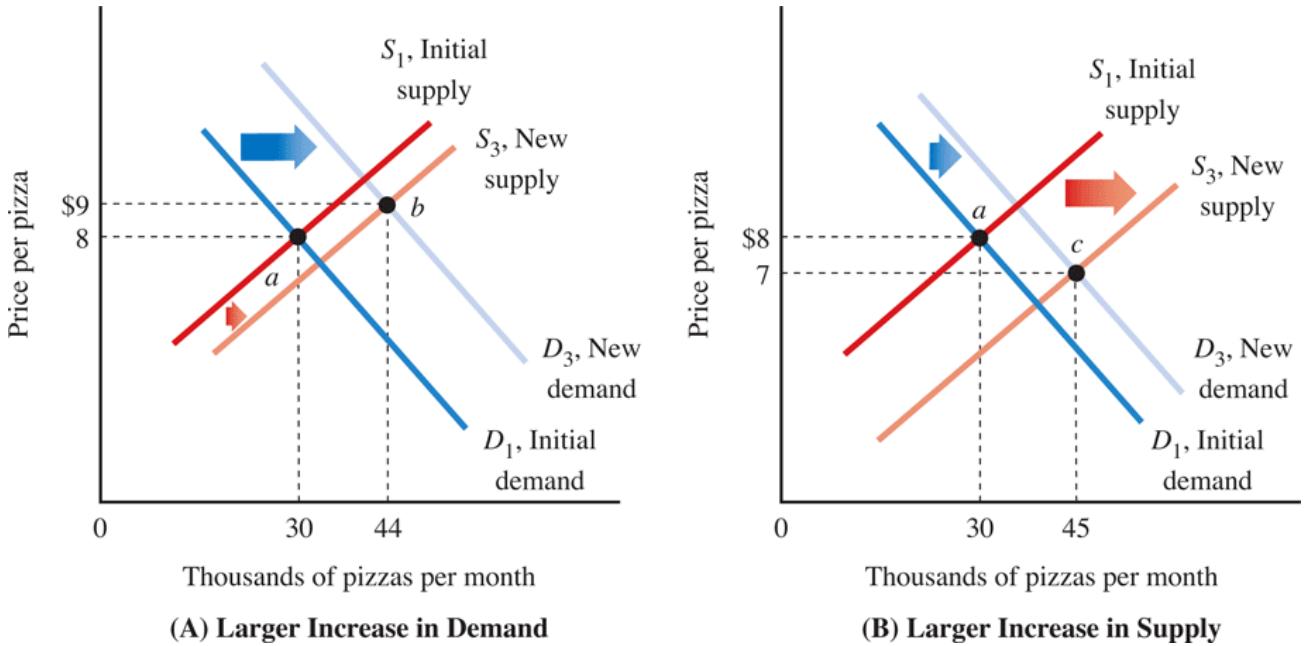
Market Effects of Supply Changes

- Supply increases , shifts to the right, if
  1. Decrease in inputs costs
  2. Advance in technology
  3. Increase in the number of producers
  4. Expectations of lower future prices Subsidy.
- As supply shifts to the right, excess supply $\rightarrow$ prices drop.

Demand and Supply Shifts

- When both, demand and supply increase, then the quantity 'traded' increases
- The price depends on the magnitude of supply change vs. demand change

Demand and Supply Shifts



The Short-Run

- Is the time period over which one or more variable are fixed (wages, factors of production etc.)
- In the long run most variables are flexible
- In the long run, more photo copy machines would be acquired and we would not see diminishing returns to labor
- Since firms can duplicate or replicate production facilities

Example: Calculating an Equilibrium

- Assume you have the following demand and supply functions given

$$\begin{aligned} D: p &= 10 - 2 \times q, \\ S: p &= 1 + 1 \times q. \end{aligned}$$

- We can draw these into a graph (do it!)
  - Start with the intercepts 10 and 1 respectively
- Then calculate the equilibrium price and quantity which is where the two lines cross

Example: Calculating an Equilibrium (cont.)

- In order to get this point, set the two equations equal to each other:

$$10 - 2q = 1 + 1q,$$

and solve for q

$$\begin{aligned} 10 &= 1 + 1q + 2q, \\ \rightarrow \quad & 10 - 1 = 1q + 2q, \\ \rightarrow \quad & 9 = 3q, \\ \rightarrow \quad & q^* = 3. \end{aligned}$$

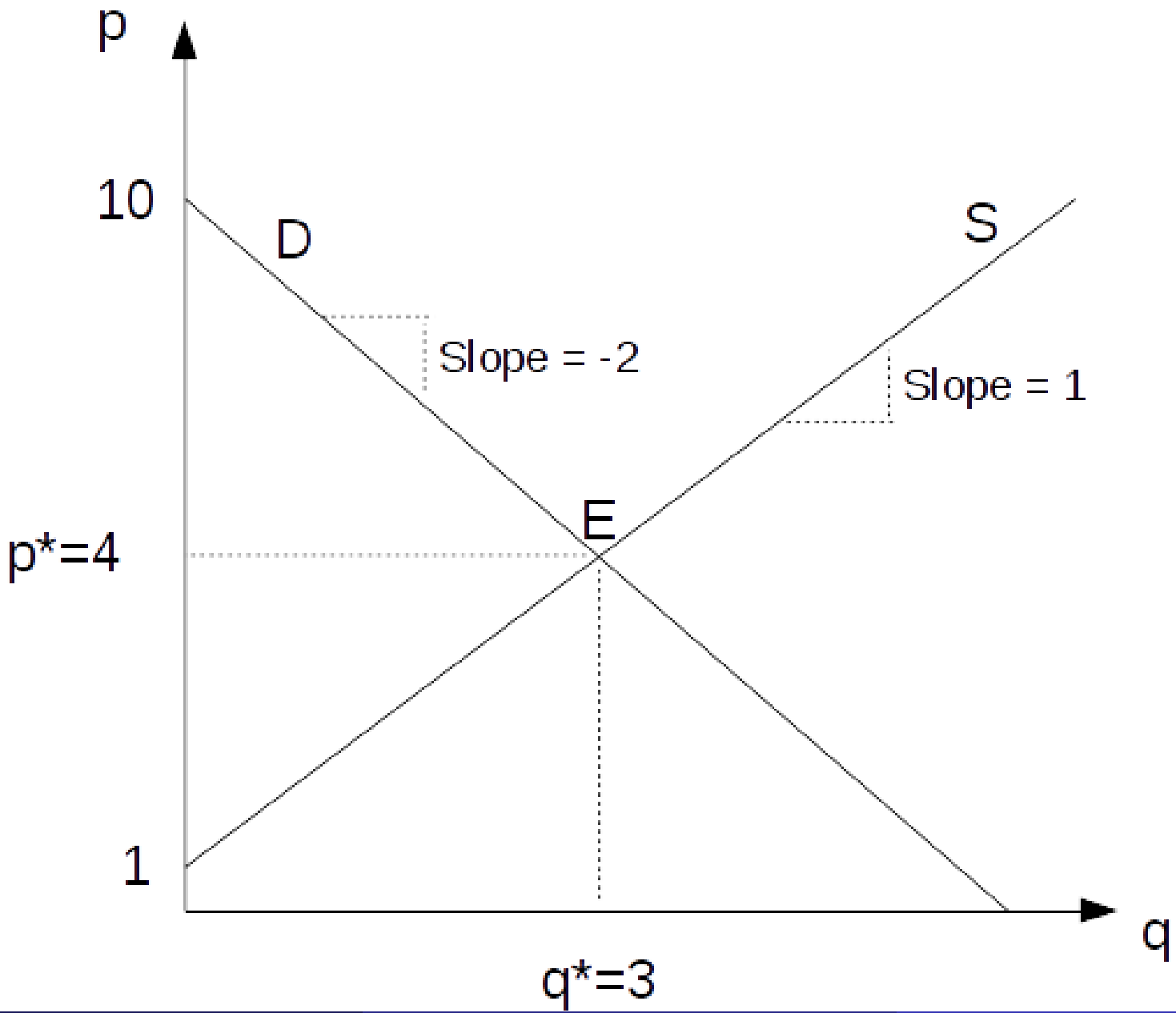
- Now plug $q* = 3$ into either the demand equation or the supply equation, it doesn't matter which and get (I plug it into supply, it seems a bit easier)

$$\begin{aligned} p &= 1 + 1 \times 3, \\ \rightarrow \quad & p* = 4, \end{aligned}$$

Example: Calculating an Equilibrium (cont.)

- Now draw the graph and put all the numbers into the graph

Example: Calculating an Equilibrium (cont.)



Example: A Supply Shift

- Let's assume that based on the previous example you hear that firms start to produce less so that supply vertically shifts by 1 unit
- When firms produce less, the supply shifts to the left.
- This means that the new intercept of supply is now at 2, so that the new supply S' is

$$S' : p = 2 + 1 \times q$$

- Let's now calculate the new equilibrium. Again we set demand D equal to the new supply S'

$$10 - 2q = 2 + 1q,$$

and we solve again for optimal (equilibrium) quantity $q*$

$$\begin{aligned} 10 - 2q &= 2 + 1q, \\ \rightarrow \quad & 10 - 2 = 3q, \\ \rightarrow \quad & q' = \frac{8}{3} = 2.66667. \end{aligned}$$

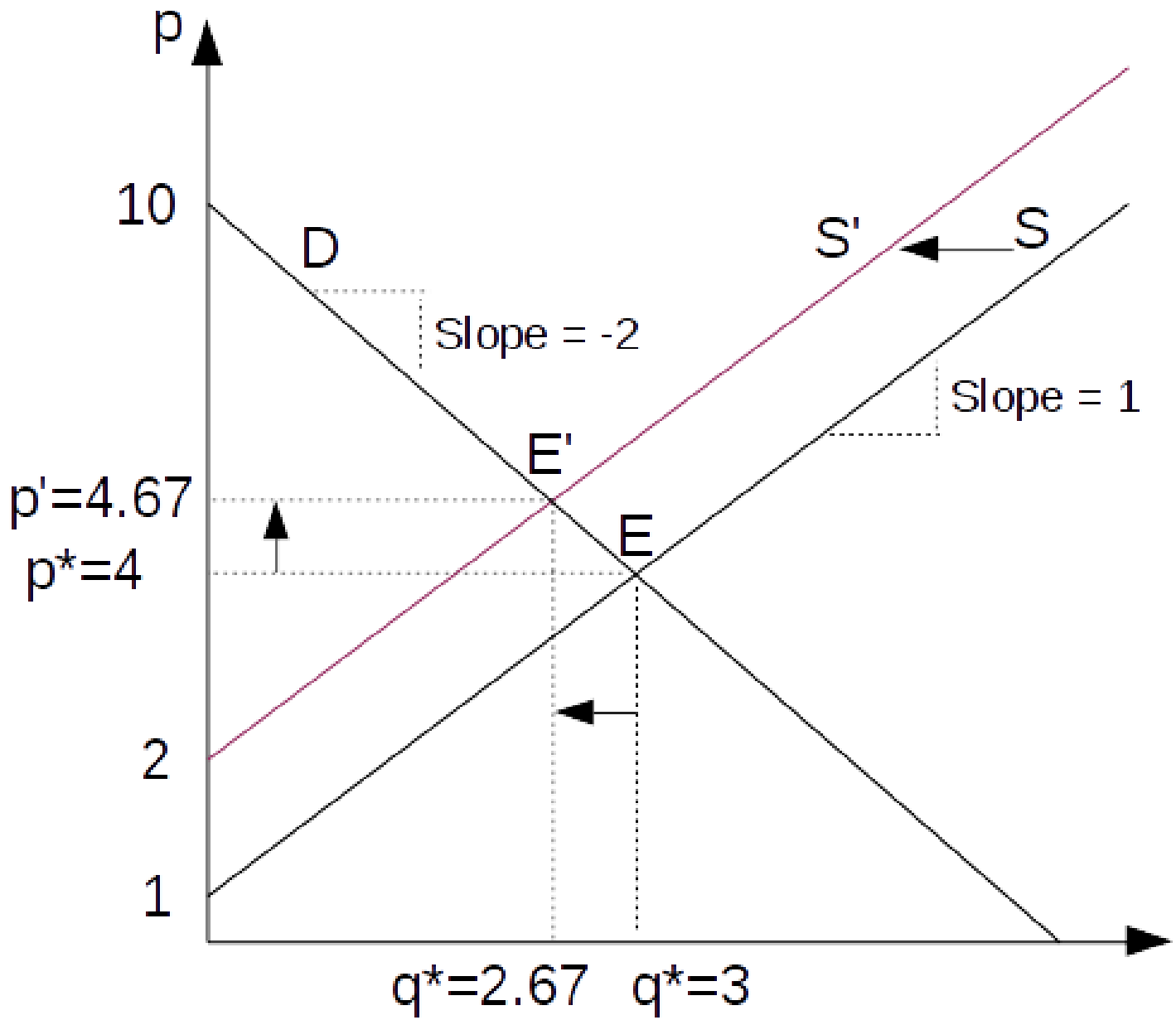
Example: A Supply Shift (cont.)

- Plug this back into either demand or new supply to get the new price p'

$$\begin{aligned} p &= 2 + 1 \times \frac{8}{3}, \\ \rightarrow \quad & p' = \frac{6}{3} + \frac{8}{3}, \\ \rightarrow \quad & p' = \frac{14}{3} = 4.66667. \end{aligned}$$

- Now draw the new graph with the new demand and supply

Example: A Supply Shift (cont.)



Extensions

Next practice the above exercise with the following case:

- Go back to the original demand supply graph with equilibrium E and analyze what happens if supply expands and vertically shifts by 2 units
- That is a right shift of demand, so that the intercept shifts up by 2 units