

Economics: The study of the allocation of scarce resources among alternative uses

Or, economics: is the social science concerned with how individuals, institutions, and society make optimal choices under conditions of scarcity.

الاقتصاد: هو ذلك العلم الذي يدرس كيف يوظف الأفراد والمجتمعات مواردهم الاقتصادية النادرة ذات الاستخدامات المتعددة لإنتاج مجموعات متباينة من السلع وذلك لإشباع حاجاتهم ورغباتهم.

What is Microeconomic?

The study of the economic choices individuals and firms make and how those choices create markets

Microeconomics is the part of economics concerned with individual units such as a person, a household, a firm, or an industry. At this level of analysis, the economist observes the details of an economic unit.

الاقتصاد الجزئي Micro-economics يتعامل مع الوحدات الفردية في الاقتصاد، وهي عادة الفرد أو الأسرة منشأة الأعمال، حيث يركز على سلوك المستهلك و بالكيفية التي توزع بها الأسرة دخلها بالإنفاق على مختلف السلع و الخدمات. كما يهتم الاقتصاد الجزئي بتحديد مستوى الإنتاج الذي يمكن المنشأة من تعظيم أرباحها.

Macroeconomics examines either the economy as a whole or its basic subdivisions or aggregates, such as the government, household, and business sectors.

Indicate whether each of the following is primarily as microeconomics issue or macroeconomics?

- The effect of higher cigarette taxes on the quantity of cigarette sold. microeconomics
- The reasons for low rates of profit in the airline industry. microeconomics
- The effect of minimum wage law on unemployment. macroeconomics
- The relationship between the inflation rate and changes in the quantity of money. macroeconomics

Economic Models:

Simple theoretical descriptions that capture the essentials of how the economy works

النموذج الاقتصادي Economic Model هو "مجموعة من العلاقات الاقتصادية التي توضع عادة بصيغ رياضية (معادلة أو مجموعة من المعادلات) تشرح سلوكية أو ميكانيكية هذه العلاقات التي تبين عمل اقتصاد أو قطاع معين". إن النموذج الاقتصادي ما هو إلا صورة مبسطة توضح طبيعة النشاط الاقتصادي لوحدة معينة أو قطاع معين، صناعة، أو دولة معينة خلال فترة زمنية معينة، على شكل رموز وقيم عددية. هذا ويعرف النموذج الاقتصادي أيضاً بأنه عبارة عن " تمثيل أو تصوير مبسط لنسق اقتصادي معين أو مشكلة اقتصادية معينة في قالب رياضي يشمل عدداً من العلاقات الرياضية التي تمثل أو تصور لسلوك أو طبيعة المشكلة والترابط بين أجزائها".

Basic Economic Principles:

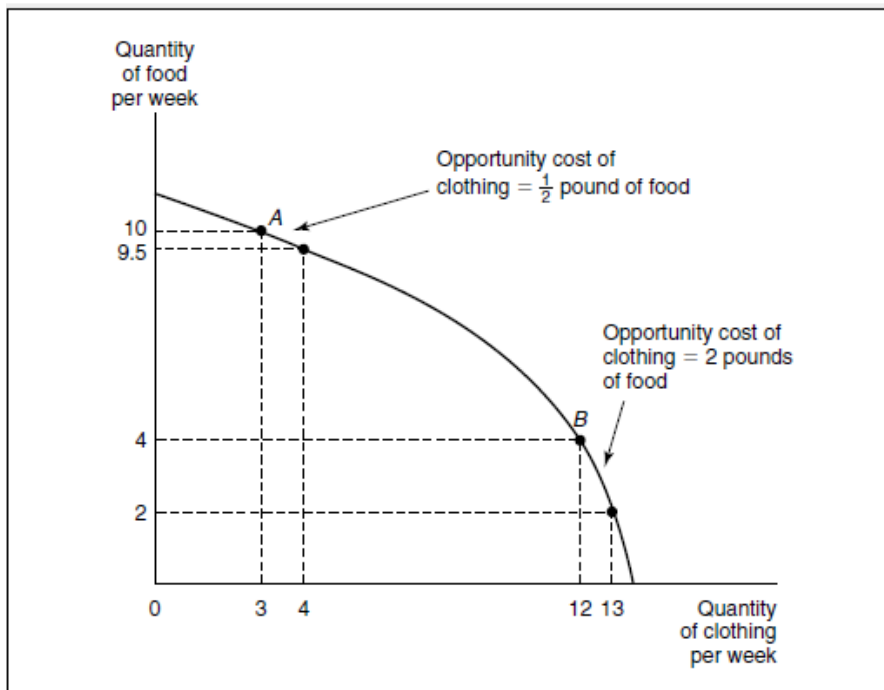
Microcosmic consists of simply applying a few basic principles. We can illustrate some of these by examining an economic model such of these: Production Possibilities curve, and Demand -Supply Model.

Production Possibilities curve

A graph showing all possible combinations of goods that can be produced with a fixed amount of resources

هو شكل (منحنى) يمثل أقصى ما يمكن أن ينتجه المجتمع من بضائع وخدمات خلال فترة زمنية معينة بكمية الموارد الإنتاجية المتوفرة.

The Figure shows the production possibility frontier for two goods, food and clothing. The graph illustrates the supply of these goods by showing the combinations that can be produced with this economy's resources. For example, 10 pounds of food and 3 units of clothing could be produced or 4 pounds of food and 12 units of clothing. Many other combinations of food and clothing could also be produced. The production possibility frontier shows all of them.



- Combinations of food and clothing outside the frontier cannot be produced (unattainable) because not enough resources are available.
- Combinations of food and clothing inside the frontier can be produced (attainable), and does not use all of the available resources (Unemployment).
- Combinations of food and clothing on the curve can be produced (unattainable), and used all available resources (full employment)

The production possibility frontier reminds us of the basic economic fact that resources are scarce—there are not enough resources available to produce all we might want of every good. This scarcity means that we must choose how much of each good to produce.

Figure below makes clear that each choice has its costs (opportunity costs). For example, if this economy produces 10 pounds of food and 3 units of clothing at point A, producing 1 more unit of clothing would “cost” 1/2 pound of food—increasing the output of clothing by 1 unit means the production of food would have to decrease by 1/2 pound.

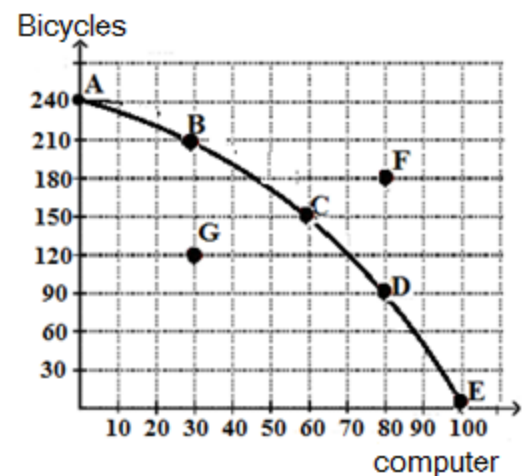
Opportunity cost: the number of units of a specific good that must be given up (يتخلى عن) to obtain one more unit of another good.

$$\text{Opportunity costs of one more unit of clothing} = \frac{\Delta F}{\Delta c}$$

For example, if this economy produces 4 pounds of food and 12 units of clothing at point B, the opportunity costs producing 1 more unit of clothing = $\frac{\Delta F}{\Delta c} = \left| \frac{(2-4)}{(13-12)} \right| = 2$

Example:

1. Which point is unattainable? **_F_**. Which point is attainable and unemployment? **_G_**. Which point is/are full employment points? **_A, B, C, D, and E_**.
2. If the economy is producing at point C, what is the opportunity cost of producing one more computer?



$$\text{Opportunity costs of one more unit of computer} = \frac{\Delta B}{\Delta C} = \frac{\Delta (90-150)}{\Delta (80-60)} = \frac{-60}{20} = -3$$

3. If the economy is producing at point B, what is the opportunity cost of producing one more Bicycle?

$$\text{Opportunity costs of one more unit of Bicycle} = \frac{\Delta C}{\Delta B} = \frac{\Delta (0-30)}{\Delta (240-210)} = \frac{-30}{30} = -1$$

4. How can the economy succeed to produce point F? (كيف يمكن لهذا الاقتصاد ان يكون قادراً على انتاج)

Increase in the quantity and the quality of economic resources
Improvement in technology

This simple model of production illustrates the following principles:

- **Resources are scarce.** Some combinations of food and clothing (such as 10 units of food together with 12 units of clothing) are impossible to make given the resources available. We simply cannot have all of everything we might want.
- **Scarcity involves opportunity costs.** That is, producing more of one good necessarily involves producing less of something else. For example, if this economy produces 10 units of food and 3 units of clothing per year at point A, producing 1 more unit of clothing would “cost” one-half unit of food. In other words, to increase the output of clothing by one unit means the production of food would have to decrease by one-half unit.

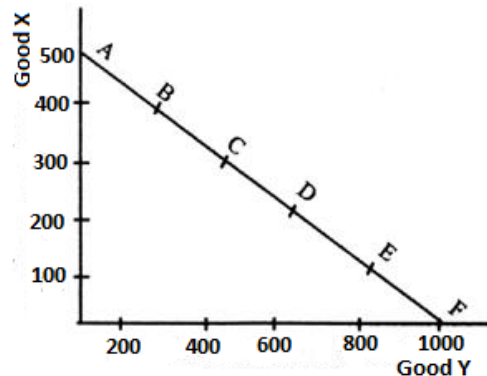
- **Opportunity costs are increasing.** Expanding the output of one particular good will usually involve increasing opportunity costs as diminishing returns set in. The Figure above shows this principle clearly. If clothing output were expanded to 12 units per year (point B), the opportunity cost of clothing would rise from one-half a unit of food to 2 units of food. Hence, the opportunity cost of an economic action is not constant but varies with the circumstances.

Example:

The following data show the production possibilities for an economy during one year.

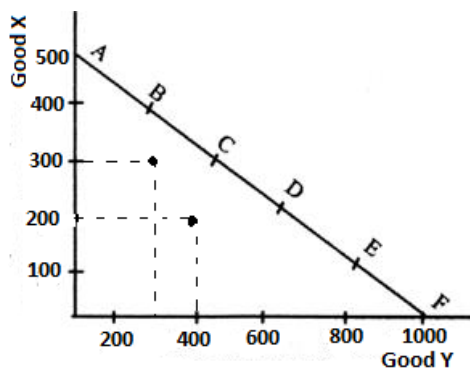
Output of X	Output of Y
1000	0
800	100
600	200
400	300
200	400
0	500

- a. Plot these points on a graph. Do they appear to lie along a straight line? What is that straight line's production possibility frontier?



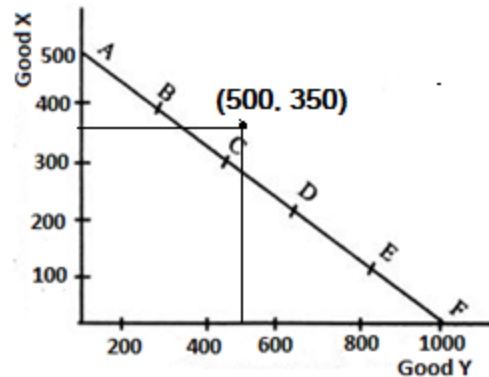
- b. Explain why output levels of X = 400, Y = 200 or X = 300, Y = 300 are inefficient. Show these output levels on your graph.

X = 400, Y = 200 or X = 300, Y = 300 are inefficient points, since they are located inside the production possibilities curve. The two points are unemployment points.



- c. Explain why output levels of X =500, Y = 350 are unattainable in this economy.

Because resources are scarce. The combinations of X =500, Y = 350 are impossible to make given the resources available. (The points outside the production possibility frontier)



- d. What is the opportunity cost of an additional unit of X output in terms of Y output in this economy? Does this opportunity cost depend on the amounts being produced?

$$\text{Opportunity cost of an additional unit of X} = \frac{\Delta Y}{\Delta X} = \frac{(100-0)}{(800-1000)} = \frac{100}{200} = 2$$

The opportunity cost is constant (straight line), and the opportunity cost does not depend on the amounts being produced

The Basic Supply-Demand Model

A model describing how a good's price is determined by the behavior of the individuals who buy the good and of the firms that sell it.

The basic supply-demand model of price determination is a staple of all courses in introductory economics—in fact, this model may be the first thing you studied in your introductory course. Here we provide a quick review, adding a bit of historical perspective.

Adam Smith and the Invisible Hand

The Scottish philosopher Adam Smith (1723-1790) is generally credited with being the first true economist. In *The Wealth of Nations* (published in 1776), Smith examined a large number of the pressing economic issues of his day and tried to develop economic tools for understanding them.

Smith saw prices as providing a powerful “invisible hand” that directed resources into activities where they would be most valuable. Prices play the crucial role of telling both consumers and firms what goods are “worth” and thereby prompt these economic actors to make efficient choices about how to use them. To Smith, it was this ability to use resources efficiently that provided the ultimate explanation for a nation’s “wealth.”

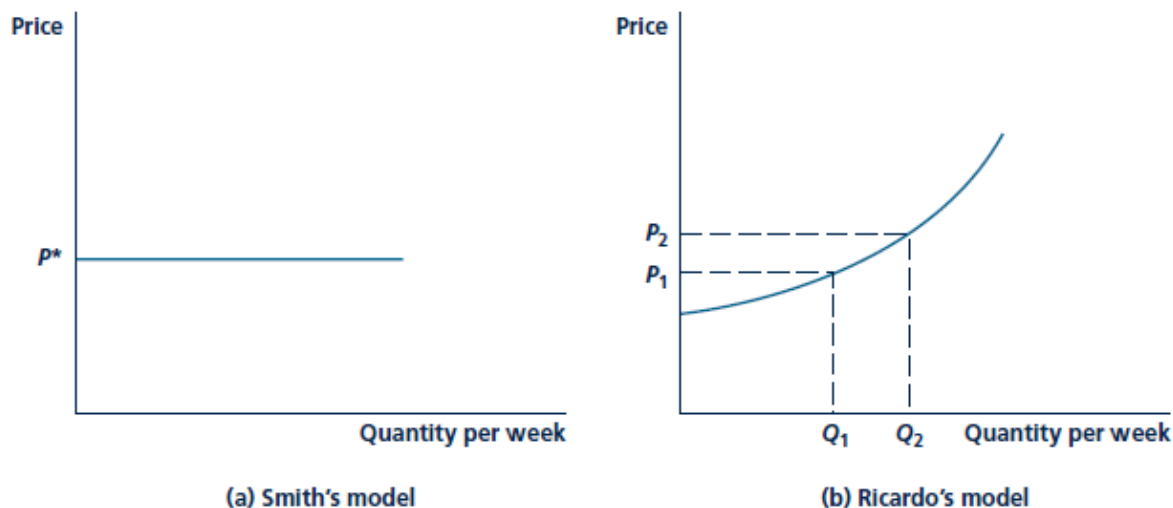
David Ricardo and Diminishing Returns:

Ricardo believed that labor and other costs would tend to rise as the level of production of a particular good expanded.

Diminishing Returns: hypothesis that the cost associated with producing one more unit of a good rises as more of that good is produced.

The problem with Ricardo's explanation was that it really did not explain how prices are determined.

FIGURE 1.2 Early Views of Price Determination



To Adam Smith, the relative price of a good was determined by relative labor costs. As shown in the left-hand panel, relative price would be P^* unless something altered such costs. Ricardo added the concept of diminishing returns to this explanation. In the right-hand panel, relative price rises as quantity produced rises from Q_1 to Q_2 .

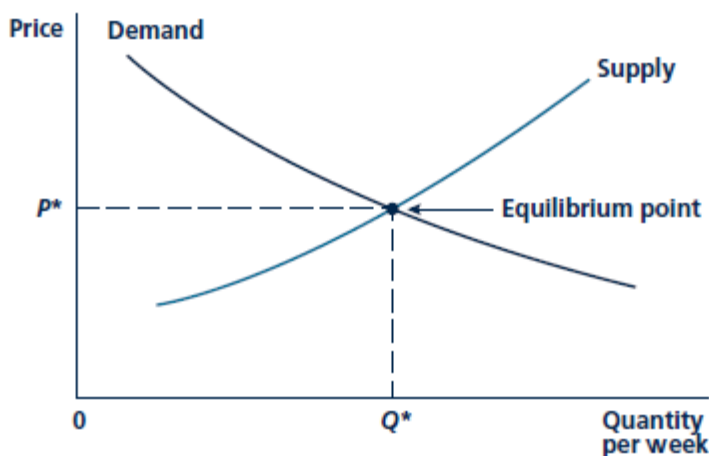
Marginalism and Marshall's Model of Supply and Demand.

Marshall believed that demand and supply together determine the equilibrium price and quantity of a good.

The curve labeled "Demand" shows the amount of the good people want to buy at each price. *The negative slope of the demand curve reflects the marginalist principle: Because people are willing to pay less and less for the last unit purchased, they will buy more only at a lower price.*

The curve labeled "Supply" shows that increasing cost of making one more unit of the good as the total amount produced increases. *The upward slope of the supply curve reflects increasing marginal cost, just as the downward slope of the demand curve reflects decreasing marginal usefulness.*

FIGURE 1.3 The Marshall Supply-Demand Cross



Supply and Demand

The basic model of supply and demand helps us understand why and how prices change, and what happens when the government intervenes in a market. The supply-demand model combines two important concepts: a supply curve and a demand curve.

The Supply Curve

Supply curve: Relationship between the quantity of a good that producers are willing to sell and the price of the good.

We can write this relationship as an equation: $Q_s = Q_s(P)$

The relationship between price and quantity supply is positive → the supply curve is upward sloping

Linear supply equation:

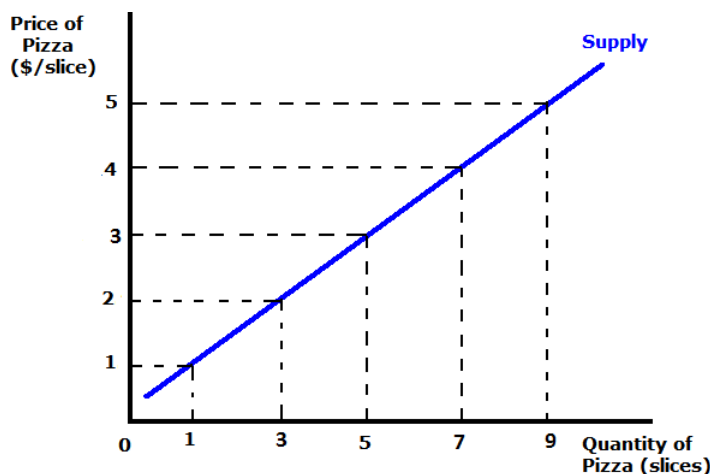
Suppose that we have a linear supply curve defined by the expression $Q_s = a + bP$, where $b > 0$. The coefficient b (slope of supply) represents the responsiveness of supply respectively to changes in price. Mathematically they are the derivatives of the supply curves with respect to price.

Graph the supply curve:

Suppose that the supply curve for wheat is given by: $Q_s = 2P - 1$. Graph the supply curve. Put on the vertical axis the price of wheat, and on the horizontal axis the quantity of wheat.

$$Q_s = 2P - 1$$

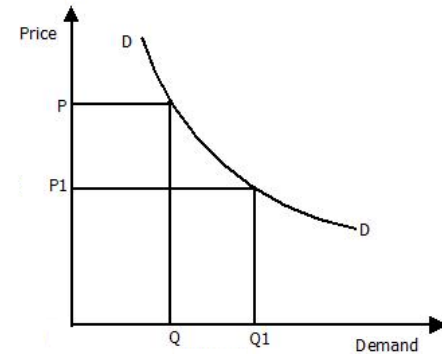
Price	Quantity
1	1
2	3
3	5
4	7
5	9



The Demand curve

The demand curve shows how much of a good consumers are willing to buy as the price per unit changes. We can write this relationship between quantity demanded and price as an equation: $Q_D = Q_D(P)$.

We can draw the demand curve graphically, as in Figure: The demand curve, labeled D , shows how the quantity of a good demanded by consumers depends on its price. The demand curve is downward sloping; holding other things equal; consumers will want to purchase more of a good as its price goes down.



Linear demand equation:

Suppose that we have a linear demand curve defined by the expression $Qd = c - dP$, where $d > 0$. The coefficients d (slope of demand curve) represents the responsiveness of demand respectively to changes in price. Mathematically they are the derivatives of the demand curves with respect to price.

Normal and inferior good:

An inferior good is a good that decreases in demand when consumer income rises, unlike, for which the opposite is observed. **Normal goods** are those for which consumers' demand increases when their income increases.

Example:

Suppose that the demand for chocolate is given by: $d = 20 - 3P + 8I$, where P is the price of chocolate and I is the consumer income. From this equation is chocolate is a normal good or inferior good? Explain

The coefficient of income measure the change in demand when income changes by one dollar

From the demand equation: when income increases by 1 dollar, demand increase by 8 units: chocolate is a normal good (income increase \rightarrow demand increase)

Substitute and complementary goods

Substitutes: Two goods for which an increase in the price of one leads to an increase in the quantity demanded of the other.

For example, copper and aluminum are substitute goods. Because one can often be substituted for the other in industrial use, the quantity of copper demanded will increase if the price of aluminum increases. Likewise, beef and chicken are substitute goods because most consumers are willing to shift their purchases from one to the other when prices change.

Complements: Two goods for which an increase in the price of one leads to a decrease in the quantity demanded of the other

For example, automobiles and gasoline are complementary goods. Because they tend to be used together, a decrease in the price of gasoline increases the quantity demanded for automobiles. Like computers and computer software are complementary goods.

Example:

Suppose Individual's demand for oranges is given by: $Q = 10 - 2P_x + 0.1I + 0.5P_y$. Where: P_x is the price of orange, P_y is the price of grapefruit. Is orange and grapefruit is complement or substitution goods? Explain

From the demand equation the coefficient of P_y measured the change in demand with respect to one dollar increase in the price of goody.

The coefficient of $P_y = 0.5$, this means that when price of grapefruit increase by 1 dollar, the demand for orange increase by 0.5 units → the two goods are substitutes (the price of one increase the demand for the other increase.

Question:

The demand for your product has been estimated to be $Q_x = 7,880 - 4P_x - 2P_y + P_z - 0.1I$. The relevant price and income data are as follows: $P_x = 10$, $P_y = 15$, $P_z = 50$, $I = \$40,000$.

1. How much X will be purchased?

$$Q_x = 7,880 - 4(10) - 2(15) + (50) - 0.1(40,000) = 3,860 \text{ units}$$

2. If consumer income (I) is decrease to \$30,000, calculate the effect of a decrease in income on the demand for good X.

Coefficient (معامل) of I is - 0.1, this means:

As income decrease by \$1, demand for good X increase by 0.1 units

$$\text{Change in income} = 40,000 - 30,000 = 10,000$$

As income decrease by \$1, demand for good X increase by 0.1 units ----> (بضرب الطرفين في 10000 ينتج)

As income decrease by \$10,000, demand for good X increase by 0.1 (10,000) = 1,000 units

Demand for good X increases by 1,000 units

3. Is X an inferior or a normal good?

Good X is inferior (an increase of income leads to a decrease in demand for good X; coefficient of I is negative)

4. Which goods are substitutes for X? Which are complements?

Good Y is complement for good X (coefficient of P_y is negative)

Good Z is substitutes for good X (coefficient of P_z is positive)

The Market Equilibrium

Equilibrium price: Price that equates the quantity supplied to the quantity demanded.

At equilibrium price: $QD = QS$

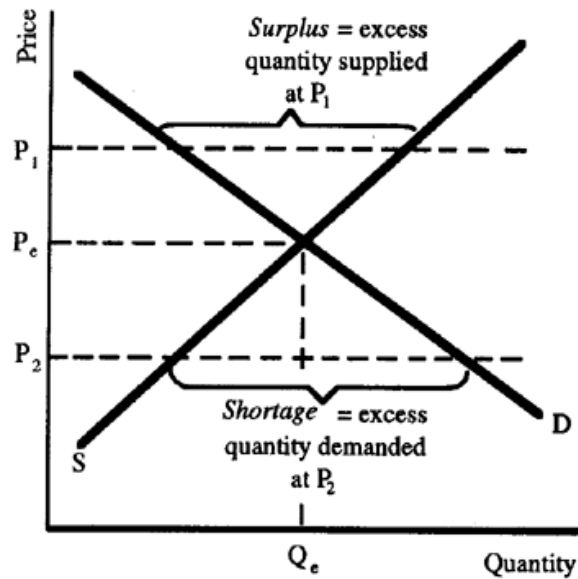
Surplus and Shortage:

Surplus: Situation in which the quantity supplied exceeds the quantity demanded ($QS > QD$)

Shortage: Situation in which the quantity demanded exceeds the quantity supplied ($QD > QS$)

The market clears at price P_0 and quantity Q_0 (market equilibrium). At the higher price P_1 , a surplus develops, so price falls. At the lower price P_2 , there is a shortage, so price is bid up.

Any price above the equilibrium price, a surplus develops. If the price below the equilibrium price there is a shortage.



- The surpluses caused by above equilibrium price
- The shortage caused by below equilibrium price

To understand why markets tend to clear, suppose the price were initially above the market-clearing level—say, P_1 in Figure. Producers will try to produce and sell more than consumers are willing to buy ($Q_S > Q_D$), a surplus will result. To sell this surplus—or at least to prevent it from growing—producers would begin to lower prices. Eventually, as price fell, quantity demanded would increase, and quantity supplied would decrease until the equilibrium price P_0 was reached.

- If $Q_S > Q_D$ (surplus), To sell this surplus producers would begin to lower prices ($P \downarrow$)
- If $Q_D > Q_S$ (shortage), To reparation this shortage prices will increase ($P \uparrow$)

Example

Let the following equations represent the supply and demand for student rental housing in Birzeit:

Demand: $P = 230 - 0.5Q$

Supply: $P = 20 + 0.25Q$

1. What is the equilibrium price and quantity of student rental housing?

At equilibrium price, $QD = QS$

$$230 - 0.5Q = 20 + 0.25Q \rightarrow 0.75Q = 210 \rightarrow Q = \frac{210}{0.75} = 280$$

$$P = 20 + 0.25Q \rightarrow P = 20 + 0.25(280) = 90$$

2. At a market price of \$80, will there be a shortage or surplus? By how much?

When $P = \$80$

$$\text{From demand equation: } 80 = 230 - 0.5QD \rightarrow QD = \frac{150}{0.5} = 300 \text{ house}$$

$$\text{From supply equation: } 80 = 20 + 0.25QS \rightarrow QS = \frac{60}{0.25} = 240 \text{ house}$$

$$QD > QS \rightarrow \text{Shortage by } 300 - 240 = 60 \text{ house}$$

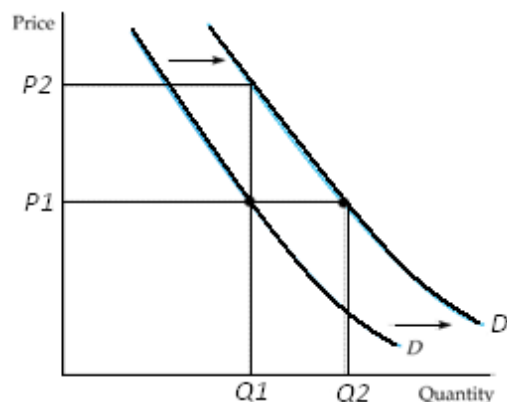
Change in Market Equilibrium:

If one of the curves were to shift, the equilibrium point would change.

Shifting the Demand Curve:

Let's see what happens to the demand curve if income levels increase. For most products, the demand increases when income rises. A higher income level shifts the demand curve to the right (from D to D').

As you can see in Figure, if the market price were held constant at P_1 , we would expect to see an increase in the quantity demanded from Q_1 to Q_2 , as a result of consumers' higher incomes. The result would be a shift to the right of the entire demand curve from D to D' .



In general: If the demand curve is given by the linear equation: $Qd = c - dP$.

- Suppose that the at each price level, the demand increase by (k) units, then the new demand equation is given by: $Qd' = (c + k) - dP$
- Suppose that the at each price level, the demand decrease by (m) units, then the new demand equation is given by: $Qd'' = (c - m) - dP$

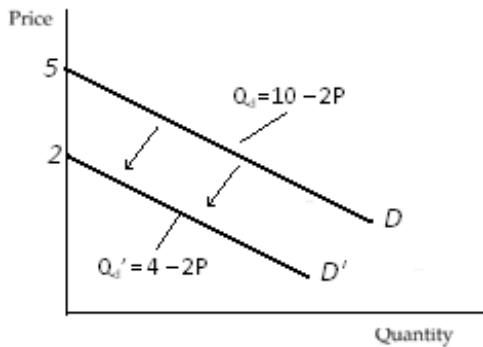
Example:

Suppose that the demand curve for wheat is given by: $Qd = 10 - 2P$. Suppose also that the consumer income decrease that leads to decrease in the consumer demand for wheat by 6 units at each price level. What is the new demand equation for wheat?

When the consumer income fall, the demand curve shift to the left, the new demand equation is given by:

$$Qd' = (10 - 6) - 2P$$

$$Qd' = 4 - 2P$$



Shift in the Supply Curve:

The supply curve shows the quantity of a good that producers are willing to sell at a given price, holding constant any other factors that might affect the quantity supplied.

Change in any other factors that might affect the quantity supplied lead to shift in the supply curve.

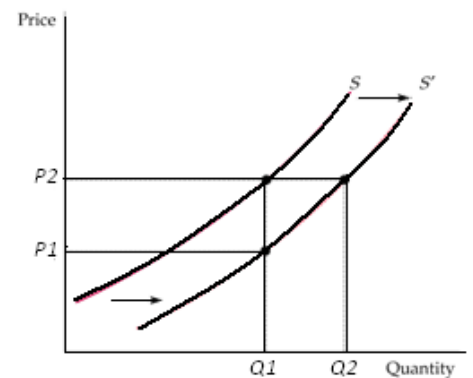
Change in the production cost:

Suppose that the production cost, including wages, interest charges, and the cost of raw materials change. This leads to shift the supply curve

Suppose that the production cost fall. How does this affect the supply curve?

When the production cost fall, firms can produce the same quantity at a lower price or a larger quantity at the same price. The supply curve then shifts to the right.

If at the same time the market price stayed constant at P_1 . We would expect to observe a greater quantity supplied. Figure shows this as an increase from Q_1 to Q_2 .



When production costs decrease, output increases no matter what the market price happens to be. The entire supply curve thus shifts to the right, which is shown in the figure as a shift from S to S'.

If the supply curve is given by the linear equation: $Q_s = a + bP$.

- Suppose that at each price level, the supply increase by (c) units, then the new supply equation is given by: $Q_{s'} = (a + c) + bP$
- Suppose that at each price level, the supply decrease by (d) units, then the new supply equation is given by: $Q_{s''} = (a - d) + bP$

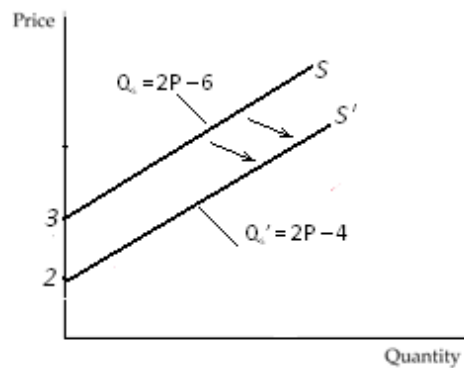
Example:

Suppose that the supply curve for wheat is given by: $Q_s = 2P - 6$. If the production cost fall that enable firms to increase the supply by 2 units at each price level, what is the new supply equation for wheat?

When the production cost fall, the supply curve shift to the right, the new supply equation is given by:

$$Q_{s'} = 2P - 6 + 2$$

$$Q_{s'} = 2P - 4$$

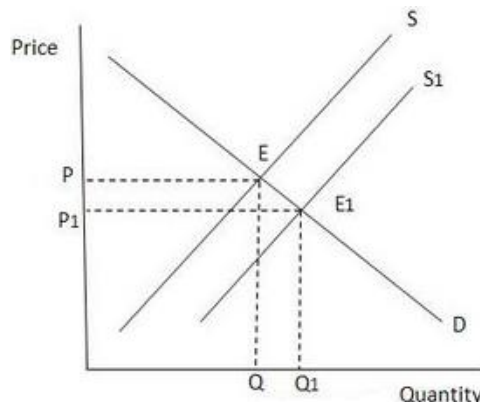


Changes in the Market Equilibrium

In this section, we will see how that equilibrium point changes in response to shifts in supply and demand curve.

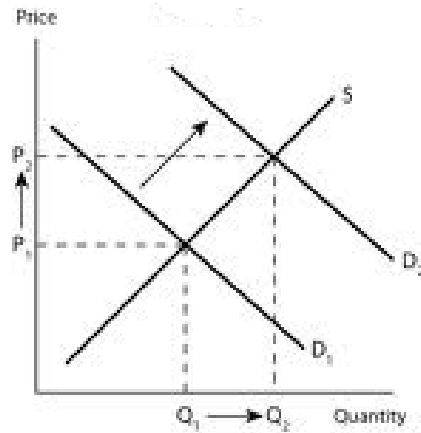
Suppose that the production cost fall, what happen to the equilibrium price and quantity?

The supply curve has shifted from S to S', as a results the market price drop from P to P₁. And the total quantity produced increase from Q to Q₁.



Suppose that the consumer income increase, what happens to the equilibrium price and quantity?

The demand curve has shifted to the right from D_1 to D_2 , as results the market price rises from P_1 to P_2 . And the total quantity increase from Q_1 to Q_2 .



New Equilibrium Following Shifts in Supply and Demand

Supply and demand curves shift over time as market conditions change. In this example, rightward shifts of the supply and demand curves lead to a slightly higher price and a much larger quantity. *In general, changes in price and quantity depend on the amount by which each curve shifts and the shape of each curve.*

Example

The following are the supply and demand for a pair of shoes:

$$\text{Demand: } QD = 1000 - 100P$$

$$\text{Supply: } QS = 125P - 125$$

a. What is the equilibrium price and quantity of pair of shoes?

At equilibrium price, $QD = QS$

$$1000 - 100P = 125P - 125 \rightarrow 225P = 1125 \rightarrow P = \frac{1125}{225} = \$5$$

$$Q = 1000 - 100P = 1000 - 100(5) = 1000 - 500 = 500 \text{ pair of shoes}$$

b. Now let us assume that the government imposes a sales tax on the producers of shoes that leads to decrease supply by 225 units at each price what is the new equilibrium price and quantity of pair of shoes?

$$\text{New supply equation: } QS' = 125P - 125 - 225 \rightarrow QS' = 125P - 350$$

At equilibrium price, $QD = QS'$

$$1000 - 100P = 125P - 350 \rightarrow 225P = 1350 \rightarrow P = \frac{1350}{225} = \$6$$

$$Q = 1000 - 100P = 1000 - 100(6) = 1000 - 600 = 400 \text{ pair of shoes}$$

Example

Demand and supply for Wheat can be illustrated by the following equations:

$$\text{Demand: } P = 20 - \frac{1}{25}Qd$$

$$\text{Supply: } P = 5 + \frac{1}{50}Qs$$

1. What are the equilibrium price and quantity?

At equilibrium: Demand = Supply

$$20 - \frac{1}{25}Q = 5 + \frac{1}{50}Q \quad \rightarrow \quad 20 - 5 = \frac{1}{50}Q + \frac{1}{25}Q \quad \rightarrow \quad 15 = \frac{3}{50}Q$$

$$750 = 3Q \rightarrow Q = \frac{750}{3} = 250 \text{ units}$$

$$P = 20 - \frac{1}{25}Q = 20 - \frac{1}{25}(250) = 20 - 10 = \$10$$

2. If the market price is \$18, is there being a shortage or surplus? By how much?

$$\text{From demand: } P = 20 - \frac{1}{25}Qd \rightarrow 18 = 20 - \frac{1}{25}Qd \rightarrow \frac{1}{25}Qd = 2 \rightarrow Qd = 50$$

$$\text{From supply: } P = 5 + \frac{1}{50}Qs \rightarrow 18 = 5 + \frac{1}{50}Qs \rightarrow \frac{1}{50}Qs = 13 \rightarrow Qs = 650$$

At $P = \$18$; $Qs > Qd \rightarrow \text{Surplus}$

$$\text{Surplus} = Qs - Qd = 650 - 50 = 600 \text{ units}$$

3. Suppose that consumer income increase that leads to increase demand of wheat by 150 units at each price level, what is the new equilibrium price and quantity?

يجب في البداية اعادة ترتيب معادلة الطلب و العرض بحيث يتم كتابتها بصورة $Qd =$

$$P = 20 - \frac{1}{25}Qd \rightarrow \frac{1}{25}Qd = 20 - P \rightarrow Qd = 25(20 - P) \rightarrow Qd = 500 - 25P$$

$$\text{Supply: } P = 5 + \frac{1}{50}Qs \rightarrow \frac{1}{50}Qs = P - 5 \rightarrow Qs = 50(P - 5) \rightarrow Qs = 50P - 250$$

$$\text{New demand equation: } Qd' = (500 + 150) - 25P \rightarrow Qd' = 650 - 25P$$

At equilibrium price, $Qd' = Qs$

$$650 - 25P = 50P - 250 \rightarrow 75P = 900 \rightarrow P = \frac{900}{75} = \$12$$

$$Q = 50P - 250 = 50(12) - 250 = 350 \text{ units}$$