

Chapter 3 Demand, Supply, and Market Equilibrium

Markets

Markets bring together buyers ("demanders") and sellers ("suppliers"), and they exist in many forms. The corner gas station, an e-commerce site, the local music store, a farmer's roadside stand—all are familiar markets. Palestinian Stock Exchange is a market where buyers and sellers of stocks and bonds and farm commodities from all over the world communicate with one another to buy and sell.

يعرف السوق بأنه الوسيلة أو الطريقة التي يتصل بواسطتها البائعون مع المشتريين اتصالاً وثيقاً لتحديد كمية ونوعية وسعر سلعة معينة يتم تبادلها بينهما.

هناك سوقاً لكل سلعة من السلع، فهناك سوق القمح، وسوق اللقمصان، وسوقاً للأحذية، وسوقاً للأوراق المالية والسندات وغيرها. وقد يكون السوق منطقة جغرافية، ولكن قد يكون أيضاً جهاز الهاتف أو جهاز التلكس أو البريد أو الفاكس، حيث تمثل هذه الأجهزة وسائل اتصال بين البائعين والمشتريين لتحديد كمية ونوعية وسعر السلعة التي يرام تبادلها.

Demand

Demand is a schedule or a curve that shows the various amounts of a product that consumers are willing and able to purchase at each of a series of possible prices during a specified period of time. Demand shows the quantities of a product that will be purchased at various possible prices, other things equal.

هناك قوتين تؤثران في السوق، وهما قوة المستهلكين ممثلة في الطلب وقوة المنتجين ممثلة في العرض. فالطلب هو أقصى كمية يرغب المستهلك شراءها من سلعة ما مع توفر المقدرة على شراء تلك الكمية وذلك حسب دخل المستهلك ومستوى سعر تلك السلعة مع أخذ العوامل الأخرى المؤثرة في الكمية المطلوبة بعين الاعتبار.

Law of Demand

Other thing equal, as price falls, the quantity demanded rises, and as price rises, the quantity demanded falls.

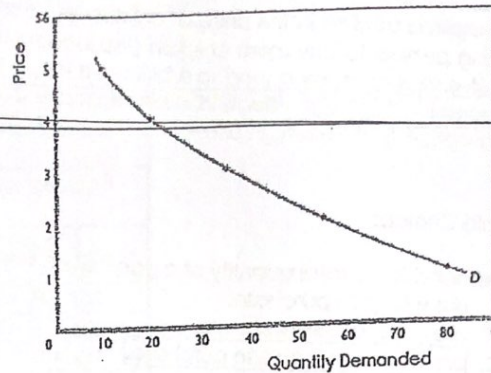
$$P \uparrow \Rightarrow Q_d \downarrow ; P \downarrow \Rightarrow Q_d \uparrow$$

There is a negative or inverse relationship between price and quantity demanded.

Demand schedule or demand curve

Because price and quantity demanded are inversely related, an individual's demand schedule graphs as a down sloping curve such as D. Other things equal, consumers will buy more of a product as its price declines and less of the product as its price rises.

Price per Bushel	Quantity Demanded per Week
5	10
4	20
3	35
2	55
1	80



The inverse relationship between price and quantity demanded for any product can be represented on a simple graph, in which, by convention, we measure *quantity demanded* on the horizontal axis and *price* on the vertical axis. In the graph in Figure above we have plotted the five price-quantity data points listed in the accompanying table and connected the points with a smooth curve, labeled *D*. Such a curve is called a *demand curve*. Its downward slope reflects the *law of demand*—people buy more of a product, service, or resource as its price falls. The relationship between price and quantity demanded is inverse (or negative).

Why the inverse relationship between price and quantity demanded?

Three explanations of these relationships

- People ordinarily do buy more of a product at a low price than at a high price. Price is an obstacle that deters consumers from buying. The higher that obstacle, the less of a product they will buy; the lower the price obstacle, the more they will buy.
- In any specific time period, each buyer of a product will derive less satisfaction (or benefit, or utility) from each successive unit of the product consumed. The second Big Mac will yield less satisfaction to the consumer than the first and the third still less than the second. That is, consumption is subject to diminishing marginal utility. And because successive units of a particular product yield less and less marginal utility, consumers will buy additional units only if the price of those units is progressively reduced.

ينص قانون تناقص المنفعة الحدية (diminishing marginal utility) على أن المنفعة الحدية التي يحصل عليها المستهلك نتيجة استهلاكه لوحدة متتالية من السلعة خلال فترة زمنية محددة ستكون متناقصة. بمعنى أن المنفعة التي تضيفها كل وحدة إلى منفعة المستهلك ستكون أقل من تلك المنفعة التي أضافتها الوحدة التي سبقتها. لذلك فالمستهلك مستعد أن يشتري وحدات إضافية إذا سعر تلك الوحدات كان أقل.

- We can also explain the law of demand in terms of *income and substitution effects*.

The income effect indicates that a lower price increases the purchasing power (القوة الشرائية) of a buyer's money income, enabling the buyer to purchase more of the product than before.

عندما يقل سعر السلعة فإن القوة الشرائية للمستهلك تزداد مما يؤدي إلى زيادة الكمية المطلوبة من السلعة.

The substitution effect suggests that at a lower price buyer have the incentive to substitute what is now a less expensive product for similar products that are now relatively more expensive.

عندما يقل سعر السلعة فإنها تصبح أرخص من السلع البديلة لهذه السلعة وبالتالي يؤدي إلى زيادة الكمية المطلوبة من تلك السلعة و نقصان الطلب على السلع البديلة

For example, a decline in the price of chicken will increase the purchasing power of consumer incomes, enabling people to buy more chicken (the income effect). At a lower price, chicken is relatively more attractive and consumers tend to substitute it for pork, lamb, beef, and fish (the substitution effect). The income and substitution effects combine to make consumers able and willing to buy more of a product at a low price than at a high price.

Multiple Choices:

1. Demand is the total quantity of a good or service that customers:
 - A. are willing to purchase.
 - B. are able to purchase.
 - C. are willing and able to purchase.
 - D. need.
2. The law of demand states that, other things remaining the same, the higher the price of a good, the:
 - A. smaller is the demand for the good.
 - B. smaller is the quantity of the good demanded.
 - C. larger is the quantity of the good demanded.
 - D. larger is the demand for the good.
3. The law of demand states that the quantity of a good demanded varies:
 - A. inversely with its price.
 - B. Directly with population.
 - C. Directly with income.
 - D. Inversely with the price of substitute goods.
4. Each point on the demand curve reflects:
 - A. The highest price consumers are willing and able to pay for that particular unit of a good.
 - B. The highest price sellers will accept for all units they are producing.
 - C. The lowest-cost technology available to produce a good.
 - D. All the wants of a given household.

Individual Demand الطلب الفردي

Is the quantity demand by single buyer at each price level

يعني بالطلب الفردي الطلب على مستوى الفرد الواحد (مستهلك واحد أو وحدة استهلاكية مثل أسرة من الأسر). ويبين الطلب الفردي العلاقة بين الكمية المطلوبة من سلعة ما من قبل أحد المستهلكين وسعر هذه السلعة، مع بقاء العوامل الأخرى المؤثرة في الطلب ثابتة.

Market Demand طلب السوق

The market demand is the summation the quantities demanded by all consumers at each of the various possible prices. The market demand curve is the horizontal summation of the individual demand curves of all the consumers in the market.

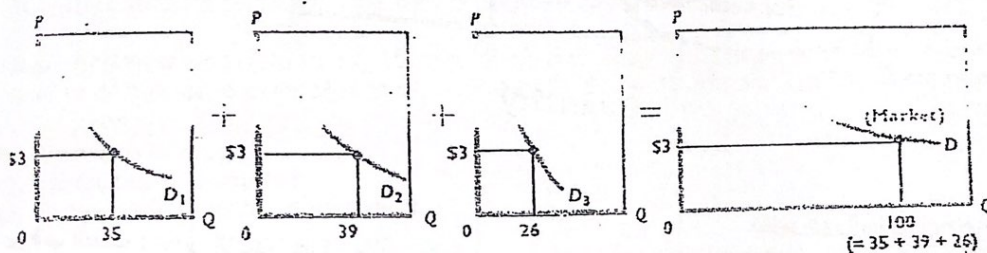
الطلب الفردي يمثل طلب أحد المستهلكين على سلعة معينة. أما طلب السوق فيمثل طلب جميع المستهلكين في السوق على نفس السلعة. ويبين طلب السوق العلاقة بين الكمية المطلوبة من سلعة ما من قبل جميع المستهلكين في السوق وسعر هذه السلعة مع افتراض العوامل الأخرى المؤثرة في الطلب ثابتة.

43

Example

Suppose that there are three buyers in the market of Corn. At each price level, the quantity demanded is given.

Price per Bushel	Quantity Demanded			Market demand
	Majed	Yousef	Sama	
\$5	10	12	8	$10 + 12 + 8 = 30$
4	20	23	17	$20 + 23 + 17 = 60$
3	35	39	26	$35 + 39 + 26 = 100$
2	55	60	39	$55 + 60 + 39 = 154$
1	80	87	54	$80 + 87 + 54 = 221$



Example

For a market of 200 corn buyers, each with a demand as shown in the table below. What is the market demand curve?

Price per Bushel	Quantity Demanded per Week	Market Demand (Qd * # of buyers)
\$5	10	$10 * 200 = 2,000$
4	20	$20 * 200 = 4,000$
3	35	$35 * 200 = 7,000$
2	55	$55 * 200 = 11,000$
1	80	$80 * 200 = 16,000$

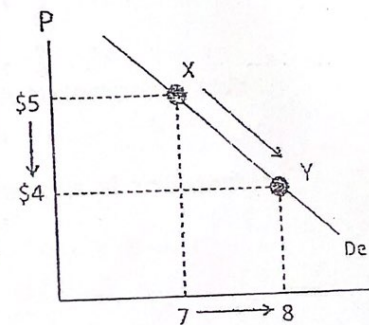
التغير في الكمية المطلوبة Change in Quantity Demanded

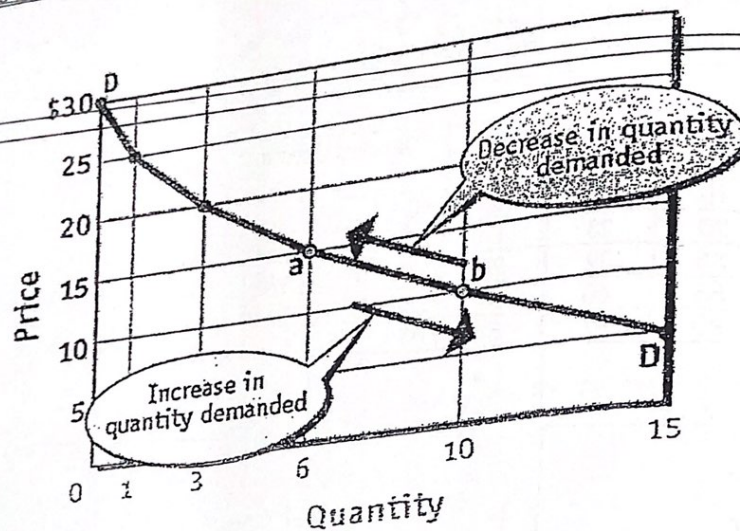
Is a movement from one point to another point on a fixed demand schedule or demand curve.

التغير في الكمية المطلوبة : تعني الانتقال من نقطة إلى نقطة على نفس منحنى الطلب. ويحدث تغيير في الكمية المطلوبة عندما يتغير سعر السلع.

Change in quantity demand is caused by increase or decrease in the price of the product.

For example, a decline in the price of corn from \$5 to \$4 will increase the quantity of corn demanded from 7 to 8 bushels. Movement from point X to point Y on the demand curve represents a change in quantity demanded (increase in quantity demanded).





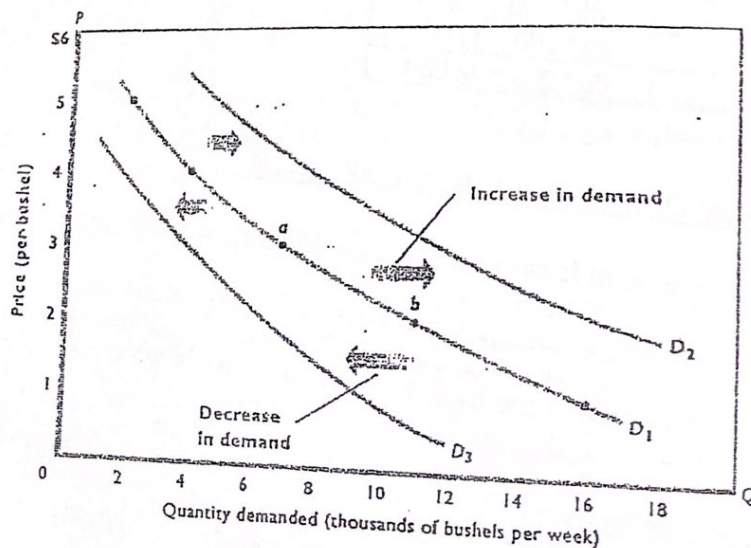
التغير في الطلب Change in Demand

التغير في الطلب : تعني الانتقال كامل منحنى الطلب. ويحدث تغيير في الطلب عندما يتغير إحدى محددات الطلب والتي سيتم توضيحها لاحقاً.

يشير مفهوم التغير في الطلب على أن الطلب على السلعة يتغير على نفس السعر.

A change in the demand schedule or, graphically, a shift in the demand curve is called a change in demand

- If the consumer desires to buy more units at each possible price, then demand increase. Increase in demand is shown as a shift of the demand curve to the right, say, from D_0 to D_1 .
- A decrease in demand occurs when consumers buy fewer units at each possible price. Decrease in demand is shown as a shift of the demand curve to the leftward, say, from D_0 to D_2 .



45

Multiple Choices:

1. A barber (حلاق) raises the price of haircuts and finds that the volume of business declines. This indicates:
 - A. a decrease in demand
 - B. an increase in demand
 - C. a decrease in quantity demanded
 - D. an increase in quantity demanded
2. The quantity of a good demanded tends to increase as its price falls because:
 - A. at lower prices, suppliers are willing to supply a greater quantity to the market
 - B. a decrease in price leads consumers to substitute toward this now relatively cheaper product
 - C. a decrease in price shifts the demand curve to the right
 - D. a decrease in price shifts the demand curve to the left
3. The consumer was able to buy 10 cans of cola at a price of \$1 in last week. In this week, it is able to buy 14 of the same cans of cola at a price of \$1. Evidently, the consumer has experienced a(n):
 - A. increase in demand
 - B. increase in supply
 - C. decrease in demand
 - D. increase in quantity demanded
4. The number of personal computers sold annually in the United States has increased at a rapid rate. The price of personal computers has fallen. The rise in sales due to the lower price is called
 - A. An increase in quantity demanded.
 - B. A decrease in quantity demanded.
 - C. An increase in quantity supplied.
 - D. An increase in demand.

Determinants of demand (demand shifters)

> Consumer's Tastes (preferences) ذوق المستهلك

A favorable change in consumer tastes for a product makes the product more desirable; means that more of it will be demanded at each price. Demand will increase (shift to the right).

An unfavorable change in consumer tastes for a product will decrease demand (shift to the left).

من الواضح أن ذوق المستهلك يلعب دوراً كبيراً في تحديد الكميات التي يطلبها المستهلك من سلعة معينة. فكلما زاد المستهلك رغبته بسلعة ما كلما زادت الكميات التي يطلبها من تلك السلعة، وكلما قل المستهلك رغبته بسلعة ما، كلما قلت الكميات التي يطلبها منها.

> Number of Buyers عدد المستهلكين للسلعة

An increase in the number of buyers in a market is likely to increase product demand ⇒ shift demand curve to the right

A decrease in the number of buyers in a market will lead to decrease demand ⇒ shift demand curve to the left

> Income دخل المستهلك

(a) Normal goods (Superior goods)

Goods whose demand varies directly with money income are called normal goods or "superior goods".

Income \uparrow \Rightarrow demand \uparrow \Rightarrow shift demand curve to the right.
Income \downarrow \Rightarrow demand \downarrow \Rightarrow shift demand curve to the left.

Examples for normal goods: Steak; Furniture; Clothing; car

(b) Inferior goods السلعة الرديئة

Goods whose demand varies inversely with money income are called inferior goods.

Income \uparrow \Rightarrow demand \downarrow \Rightarrow shift demand curve to the left.
Income \downarrow \Rightarrow demand \uparrow \Rightarrow shift demand curve to the right.

Examples for normal goods: Used Furniture, Used Clothing

Multiple choices:

- If a good is inferior and income decreases then
 - The demand curve will shift to the right
 - The supply curve will shift to the right
 - The demand curve will shift to the left
 - The supply curve will shift to the left
- Gasoline is a normal good. When consumer income increases, there will be
 - a rightward shift in gasoline supply curve
 - A leftward shift in gasoline supply curve
 - A rightward shift in gasoline demand curve
 - A leftward shift in gasoline demand curve
- If used cars are inferior goods and incomes decline
 - sales of new cars remain unchanged
 - sales of used cars decline
 - sales of new cars increase
 - sales of used cars increase

> Prices of Related Goods

(a) Substitutes good (السلع البديلة) : Is one that can be used in place of another good.

سمي السلعتين بديلتين إذا كان بإمكان المستهلك أن يستخدم أحدهما بدلاً من الأخرى في الاستهلاك.

Examples: Coca-Cola and Pepsi; Colgate toothpaste and Crest; Nike and Reeboks; Chevrolets and Fords

When two products are substitutes, an increase in the price of one will increase the demand for the other.

For example, an increase in the price of Coca-Cola, consumers will buy less of it and increase their demand for Pepsi. \Rightarrow Shift demand curve for Pepsi to the right.

(b) Complements good (السلع المكملة): Is one that is used together with another good?

تعرف السلعتان بأنهما مكملتان لبعضهما إذا اقترنت استهلاك الأولى باستهلاك الثانية، وحتى يحصل المستهلك على منفعة معينة فإنه يستهلك السلعتين معاً.

Examples: Car and Gasoline; Computers and Software; Camera and film; Cell phone and Cellular service

When two products are complements, an increase in the price of one will decrease the demand for the other.

For example, a decline in the price of cars, consumers will buy more of it and increase the demand for gasoline \Rightarrow shift demand curve for gasoline to the right

(c) Unrelated good (السلع الغير مرتبطة):

Goods are not related to one another is called unrelated or independent.

Examples: Butter and Golf balls; Potatoes and Automobiles; Bananas and Camera

If a change in the price of one has no effect on the demand for the other, then the two good are unrelated

Multiple choices:

- If the price of a complement decreases, all else equal.
 - Quantity demanded will decrease.
 - Demand will increase.
 - Demand will decrease.
 - Supply will increase.
- If the price of orange juice rises, the demand for grapefruit juice will
 - increase because the two goods are substitutes
 - increase because it is a complement
 - decrease because the two goods are substitutes
 - decrease because the two goods are complements
- Assume chickens are normal goods and chickens and meat are substitutes, which of the following will cause the demand curve for chickens to shift to the left.
 - increase in consumers' incomes
 - decrease in the price of chickens
 - increase in the price of meat
 - decrease in the price of meat
- Which of the following events would increase a student's demand for Falafel?
 - an increase in the price of Falafel
 - a decrease in the price of Hamburgers (Falafel and Hamburgers are substitutes)
 - a decrease in the price of Coca-Cola (Falafel and Coca-Cola are complements)
 - An increase in student monthly allowance (مصرف شهري) that the student receives from his family (Falafel is an inferior good).

5. A rightward shift in the demand curve for product C might be caused by:

- A. An increase in income if C is an inferior good.
- B. A decrease in income if C is a normal good.
- C. A decrease in the price of a product that is a close substitute for C.
- D. A decrease in the price of a product that is complementary to C.

> Consumer Expectations توقعات المستهلك تجاه التغير في سعر السلعة

expectation of higher future prices may cause consumers to buy now in order to anticipated price rises \Rightarrow increasing current demand (shift current demand to the right)

For example, inclement weather (الطقس الرديئ) creates an expectation of higher future prices of Tomato, this lead to increasing today's demand for Tomato.

Multiple choices:

1. If buyers expect the price of a good to rise in the future, the result is
 - A. an increase in supply today
 - B. a decrease in quantity demanded today
 - C. an increase in demand today
 - D. an increase in quantity demanded today
2. If the price of gasoline rises dramatically,
 - A. The quantity demanded for cars will decrease.
 - B. The demand for commuter train rides will decrease.
 - C. The demand for cars will decrease.
 - D. The quantity of commuter train rides demanded will increase.
3. Which of the following will increase the demand for large automobiles?
 - A. A fall in the price of small automobiles.
 - B. A decrease in insurance rates for large automobiles.
 - C. A fall in the price of large automobiles.
 - D. A decrease in buyers' incomes (assuming large automobiles to be a normal good).

Supply

Is a schedule or curve showing the various amounts of a product that producers are willing and able to make available for sale at each price level.

هو أقصى كمية يرغب المنتج بإنتاجها وعرضها من سلعة ما مع توفر القدرة على إنتاج تلك السلعة.

Law of Supply

Other thing equal: as price rises, the quantity supplied rises; as price fall, the quantity supplied falls.

$P \uparrow \Rightarrow Q_s \uparrow$

$P \downarrow \Rightarrow Q_s \downarrow$

There is a positive relationship between price and quantity supplied.

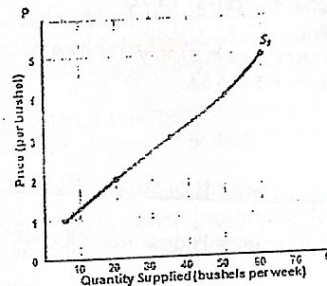
The supply curve

• العرض الفردي Individual supply curve

The supply curve for an individual producer graphs as an up sloping curve. Other thing equal, producers will offer more of a product for sale as its price rises and less of the product for sale as its price falls.

عرض أحد المنتجين يبين العلاقة بين الكمية المعروضة من سلعة ما من قبل أحد المنتجين وسعر هذه السلعة، مع بقاء العوامل الأخرى ثابتة.

Price per Bushel	Quantity supplied per week
\$5	60
4	50
3	35
2	20
1	5



عرض السوق Market Supply

The market supply is the summation the quantities supplied by all consumers at each of the various possible prices.

ذكرنا أن العرض الفردي يمثل عرض أحد المنتجين، أما عرض السوق فيمثل عرض جميع المنتجين. ويبين عرض السوق العلاقة بين الكمية المعروضة من سلعة ما من قبل جميع المنتجين في السوق وسعر هذه السلعة، مع افتراض العوامل الأخرى المؤثرة في العرض ثابتة.

Example

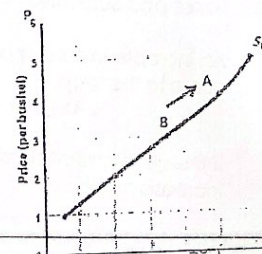
For a market of 200 corn sellers, each with a quantity supply as shown in the table below. What is the market supply schedule?

Price per Bushel	Quantity Supplied per Week	Market supply (Qs * # of producers)
\$5	60	$60 * 200 = 12,000$
4	50	$50 * 200 = 10,000$
3	35	$35 * 200 = 7,000$
2	20	$20 * 200 = 4,000$
1	5	$5 * 200 = 1,000$

Change in Quantity Supplied التغير في الكمية المعروضة

Is a movement from one point to another point on a fixed supply schedule or supply curve.

Change in quantity supply is caused by a change in the price of the product.



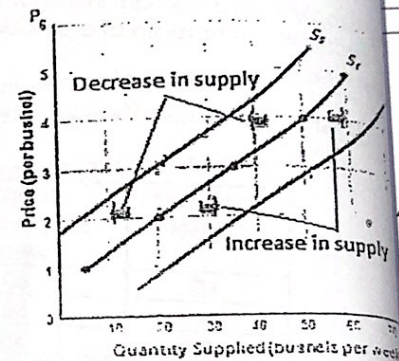
For example, an increase in the price of corn from \$3 to \$4, increase the quantity of corn supplied from 35,000 to 50,000. Movement from point A to B on the fixed supply curve.

Change in Supply

A change in one or more of the determinants of supply causes a change in supply.

An increase in supply is shown as a rightward shift of the supply curve as from S_1 to S_2 .

A decrease in supply is shown as a leftward shift of the supply curve as from S_1 to S_3 .



Determinants of Supply (Supply Shifters) العوامل المؤثرة في العرض

1. Resource Prices أسعار الموارد الإنتاجية

- Higher resource prices raise production cost, this leads to decrease the profit. Reduction in profits reduces the incentive for firms to supply output at each product price \Rightarrow shift supply curve to the left (upward).
- Lower resource prices reduce production cost and increase the profit. Raises profits raise the incentive for firms to supply output at each product price \Rightarrow shift supply curve to the right.

Example

A decrease in the price of microchips increases the supply of computers.

An increase in the price of textile, decrease the supply of furniture.

2. Technology

Improvement in technology enable firms to produce units of output with fewer resources \Rightarrow reduce production cost \Rightarrow increase the supply (shift supply curve to the right)

For example, the development of more effective wireless technology increases the supply of cell phones.

3. Taxes and Subsidies الضرائب والدعم الحكومي

An increase in sale or property taxes will increase production cost and reduce supply (shift supply curve to the left)

شك أن فرض الحكومة ضرائب على السلعة يؤدي إلى زيادة تكاليف الإنتاج وبالتالي تقليل الكميات المعروضة.

If the government subsidizes the production of a good, it in effect lowers the production costs and increase supply.

إذا قدمت الحكومة دعم لمنتجي الخبز فإن ذلك يؤدي إلى انخفاض تكاليف الإنتاج وبالتالي القدرة على إنتاج كمية أكبر وعرض كمية أكبر

Examples

- An increase in the excise tax cigarettes reduces the supply of cigarettes.
 - A decline in subsidies to state universities reduce the supply of higher education
- إنخفاض الدعم الحكومي المقدم للجامعات يؤدي إلى انخفاض العرض على التعليم

4. Prices of Other Goods أسعار السلع البديلة في الإنتاج

تعرف السلعتان البديلتان في الإنتاج أنهما سلعتان يمكن إنتاجهما بنفس المواد الإنتاجية. فالقمح والشعير، يعتبران بديلين في الإنتاج حيث أن بإمكان المزارع أن ينتج أي منهما باستخدام نفس المواد التي يمتلكها. فإذا ازداد سعر الشعير فإن المزارع سيندفع نحو زراعة الشعير وذلك على حساب القمح، أي أن الكميات المعروضة من القمح ستتناقص.

Firms that produce a particular product say, soccer balls, can sometimes use their plant and equipment to produce alternative goods, say, basketballs and volleyballs since soccer balls and basketballs are substitutes in production.

The higher prices of these "other goods" may entice soccer ball producers to switch production to those other goods in order to increase profits. This substitution in production results in a decline in the supply of soccer balls.

Example: An increase in the price of cucumbers decrease the supply of watermelons.

إذا ازداد سعر الخيار فإن المزارع سيندفع نحو زراعة الخيار وذلك على حساب البطيخ، أي أن الكميات المعروضة من البطيخ ستتناقص

5. Producer Expectations about the future price

Farmers anticipating a higher wheat price in the future might withhold (يحبس) some of their current wheat harvest from the market, thereby (بذلك) causes a decrease in the current supply of wheat.

6. Number of Sellers عدد الباعة في السوق

Other things equal, the larger the number of suppliers, the greater the market supply. As more firms enter an industry, the supply curve shifts to the right.

Multiple choices:

1. If an excise tax is imposed on a good or service,
A. the supply curve shifts upward
B. the supply curve shifts downward
C. the price paid by consumers decreases
D. the quantity produced and sold increases
2. Supply curves do not shift if there is a change in the
A. Number of sellers of the good.
B. Technology used to produce the good.
C. Price of the good.
D. Price of resources used to produce the good.

3. All of the following shift the supply of watches to the right except (استثناء)
- an increase in the price of watches
 - an advance in the technology used to manufacture watches
 - a decrease in the wage of workers employed to manufacture watches
 - manufacturers' expectation of lower watch prices in the future
4. What will happen in the rice market if sellers are expecting higher prices in the near future?
- The demand for rice will increase.
 - The demand for rice will decrease.
 - The supply for rice will decrease.
 - The supply of rice will increase
5. Wheat is the main input in the production of flour. If the price of wheat increases, all else equal, we would expect
- The supply of flour to be unaffected.
 - The supply of flour to decrease.
 - The supply of flour to increase.
 - The demand for flour to decrease.
6. If good Y is a substitute in production for X then an increase in the price of Y will:
- Cause an increase in the supply for X.
 - Cause a decrease in the demand for X.
 - Cause an increase in the supply for Y.
 - Cause a decrease in the demand for Y.
7. Which one of the following would cause the supply of bananas to increase?
- A technological advance which lowers the cost of banana production.
 - A decrease in the number of producers of bananas.
 - An increase in the price of a fertilizer used in growing bananas.
 - A severe rain shortage (which causes banana trees to die off).

Example

What effect will each of the following have on the supply of auto tires?

- a. A technological advance in the methods of producing tires.

A technological advance in the methods of producing tires enable firms to produce tires with fewer resources \Rightarrow reduce production cost \Rightarrow increase the supply of auto tires (shift supply curve to the right)

- b. A decline in the number of firms in the tire industry.

The smaller the number of firms in the tire industry, the less the market supply of auto tires. Shift the supply curve of auto tires to the left.

- c. An increase in the prices of rubber (مطاط) used in the production of tires.

Higher prices of rubber raise production cost, this leads to decrease the profit. Reduction in profit reduces the incentive for firms to supply auto tires at each price \Rightarrow shift supply curve to the left.

53

d. The expectation that the equilibrium price of auto tires will be lower in the future than currently.

The expectation that the equilibrium price of auto tires will be lower in the future induce firms of tires to expand production causing current supply to increase. \rightarrow Shift supply curve to the right

e. A decline in the price of the large tires used for semi trucks and earth-hauling rigs (with no change in the price of auto tires).

Auto tires and large tires are substitutes in production. A decline in the price of the large tires leads large tires producers to switch production to auto tires in order to increase profits. \rightarrow Increase supply of auto tires \rightarrow shift supply curve of auto tires to the right.

f. The levying of a per-unit tax on each auto tire sold.

A per-unit tax on each auto tire sold will increase production cost and reduce supply (shift supply curve to the left)

g. the granting of a 50-cent-per-unit subsidy for each auto tire produced.

A per-unit subsidy for each auto tire produced will decrease production cost and raises supply of auto tire (shift supply curve to the right).

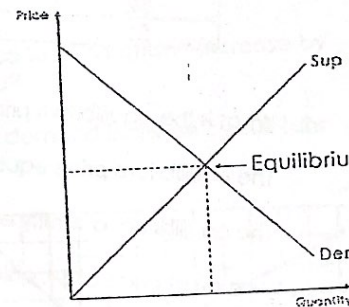
Market Equilibrium توازن السوق

Equilibrium Price and Quantity

The equilibrium price (market clearing price) is the price where quantity demanded equals quantity supplied.

At equilibrium price: $Q_d = Q_s$

Graphically, the equilibrium price is indicated by the intersection (تقاطع) of the supply curve and the demand curve.



- At equilibrium price, there is neither a shortage nor a surplus.

- When $Q_d > Q_s \rightarrow$ shortage (excess demand) : $Excess\ Demand = Q_d - Q_s$

- When $Q_s > Q_d \rightarrow$ surplus (excess supply) : $Excess\ Supply = Q_s - Q_d$

- The surpluses caused by above equilibrium price

إذا كان السعر أعلى من سعر التوازن فإن ذلك يسبب مشكلة فائض من السلعة في السوق، أي أن الكمية المعروضة أكبر من الكمية المطلوبة.

- The shortage caused by below equilibrium price

إذا كان السعر أقل من سعر التوازن فإن ذلك يسبب مشكلة نقص من السلعة في السوق، أي أن الكمية المطلوبة أكبر من الكمية المعروضة.

Example
Based on the following table which represents the supply and demand schedule answer the following questions

Price per Bushel	Total Quantity Supplied	Total Quantity Demanded	Surplus(+) or Shortage(-)	The effect on price
		2,000		
\$5	12,000	4,000		
\$4	10,000	7,000		
\$3	7,000	11,000		
\$2	4,000	16,000		
\$1	1,000			

1. Complete the table

Price per Bushel	Total Quantity Supplied	Total Quantity Demanded	Surplus(+) or Shortage(-) ($Q_s - Q_d$)	The effect on price
		2,000	+ 10,000	Decrease
\$5	12,000	4,000	+ 6,000	Decrease
\$4	10,000	7,000	0	no effect
\$3	7,000	11,000	- 7,000	Increase
\$2	4,000	16,000	- 15,000	Increase
\$1	1,000			

2. What is the equilibrium price? What is the equilibrium quantity?

The equilibrium price equals \$3, when $Q_d = Q_s$

The equilibrium quantity equal 7000 bushels of corn.

3. At market price of \$4, calculate the excess supply

Excess Supply = $Q_s - Q_d = 10,000 - 4,000 = 6,000$

Example

Based on the following table which represents the supply and demand schedule for one seller of meat

a. Suppose that there are 100 sellers and 100 buyers of meat in this market. What is the equilibrium price and quantity of meat in this market?

Price	Quantity demanded	Quantity supplied
\$20	395	200
\$22	375	250
\$24	350	290
\$26	320	320
\$28	280	345

Market demand = number of buyers * Quantity demanded for one buyer.

Market supply = number of sellers * Quantity supplied for one seller.

At equilibrium price: $Q_d = Q_s$: equilibrium price = \$26
equilibrium quantity = 32,000

Price	Market demand	Market supply
\$20	39,500	20,000
\$22	37,500	25,000
\$24	35,000	29,000
\$26	32,000	32,000
\$28	28,000	34,500

35

- b. When government sets the price of a meat at \$28, will there be a shortage or surplus? By what amount?

At \$28 of price : $Q_s = 34,500$, $Q_d = 28,000 \Rightarrow Q_s > Q_d \Rightarrow$ surplus of the meat by the amount of 6,500 units (34,500 - 28,000)

Example

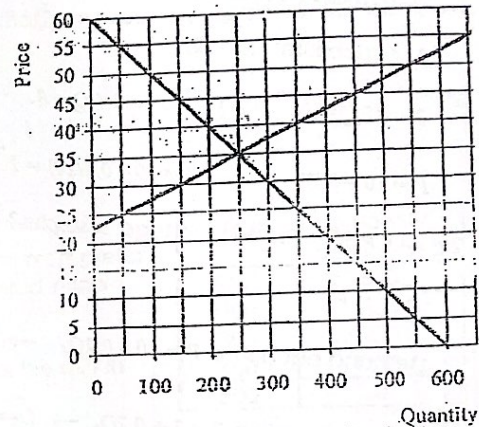
Consider the following market demand and supply curves for Cheese. Quantities are in tons and prices in dollars.

- a. What is the equilibrium price and quantity of Cheese in this market?

The equilibrium price is indicated by the intersection of the supply curve and the demand curve.

Equilibrium price: \$35

Equilibrium quantity: 250 tons



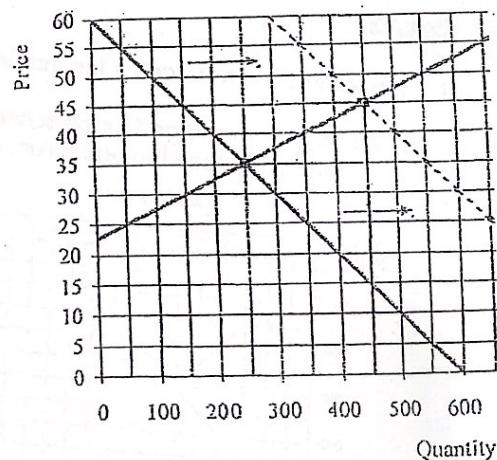
- b. Suppose the government purchased 300 tons of cheese at each price level (demand increase by 300 tons), what is the equilibrium price and quantity after this purchase?

Demand increase by 300 tons, means that the at each price quantity demand increase by 300 tons

Price	Q_d	Q_d' (new demand)	Q_s
25	350	$350 + 300 = 650$	50
30	300	$300 + 300 = 600$	150
35	250	$250 + 300 = 550$	250
40	200	$200 + 300 = 500$	350
45	150	$150 + 300 = 450$	450
50	100	$100 + 300 = 400$	550

Equilibrium price: \$45

Equilibrium quantity: 450 tons



Example:

Assume that demand for a commodity is represented by the equation $P = 10 - 0.2Q_d$ and supply by the equation $P = 2 + 0.2Q_s$, where Q_d and Q_s are quantity demanded and quantity supplied, respectively, and P is price.

1. What is the equilibrium price and quantity for a commodity?

At equilibrium: $Q_d = Q_s$

$$2 + 0.2Q = 10 - 0.2Q \rightarrow 0.4Q = 8 \rightarrow Q = \frac{8}{0.4} = 20$$

$$P = 10 - 0.2Q \rightarrow P = 10 - 0.2(20) = 10 - 4 = \$6$$

2. At $P = \$5$ is there a shortage or surplus? By how much the surplus or shortage?

At $P = \$5$

Demand equation: $P = 10 - 0.2Q_d \rightarrow Q_d = \frac{10-P}{0.2}$; At $P = \$5$, $Q_d = \frac{10-5}{0.2} = 25$

Supply equation $P = 2 + 0.2Q_s \rightarrow Q_s = \frac{P-2}{0.2}$; At $P = \$5$, $Q_s = \frac{5-2}{0.2} = 15$

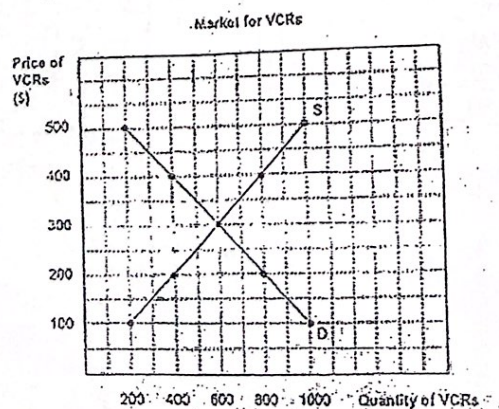
At $P = \$5$: $Q_d > Q_s \rightarrow$ shortage

By the amount equal $25 - 15 = 10$ units

Example:

1. The table above describes the market for VCRs.
- a. Plot the demand and supply schedules. What is the equilibrium price? The equilibrium quantity?

Price	Quantity Demanded	Quantity Supplied
\$100	1000	200
200	800	400
300	600	600
400	400	800
500	200	1000



- b. At the price of \$200, what is the quantity demanded? What is the quantity supplied? Will price tend to increase?

Quantity demanded = 800 VCRs
Quantity supplied = 400 VCRs

Yes, there is a shortage and price will increase

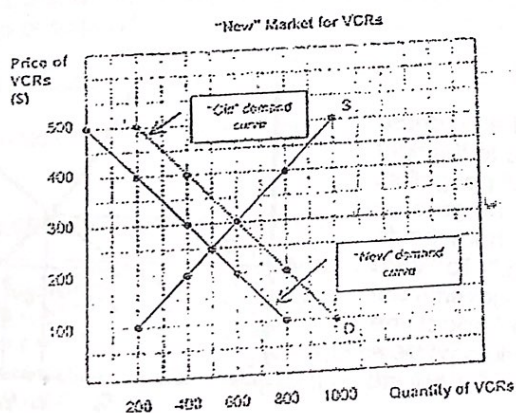
- c. At the price of \$400, what is the quantity demanded? What is the quantity supplied? Will price tend to decrease?

Quantity demanded = 400 VCRs
Quantity supplied = 800 VCRs
Yes, there is a surplus and price will decline.

2. A new product, DVD is introduced into this market and consumers prefer it to VCRs. The new demand schedule for VCRs is represented in the following table.

Price	Quantity Demanded
\$100	800
200	600
300	400
400	200
500	0

- a. Plot the new demand schedule. What is the direction of the shift in the demand curve?



The demand curve shifts to the left

- b. What is the new equilibrium price and quantity?

Equilibrium price = \$250
Equilibrium quantity = 500 VCRs

- c. Is there an excess demand or excess supply at the old equilibrium price?

There is an excess supply at the old equilibrium price.

تدخل الحكومة في الأسواق Application: Government Set Prices

من أبرز أشكال تدخل الحكومة في الاقتصاد هو تدخلها في تسعير بعض السلع والخدمات. إن سعر التوازن ليس بالضرورة أن يكون منخفضاً بل على العكس يمكن أن يكون مرتفعاً. فإذا كان سعر التوازن مرتفعاً فإن المنتجين هم الذين سيتذمرون. وفي تلك الحالات قد تتدخل الحكومة وتفرض سعر حماية المستهلكين في حالة ارتفاع السعر أو لحماية المنتجين في حالة تدني السعر.

السقف السعري Price Ceilings

A price ceiling sets the maximum legal price a seller may charge for a product or services. A price at or below the ceiling is legal; a price above it is not.

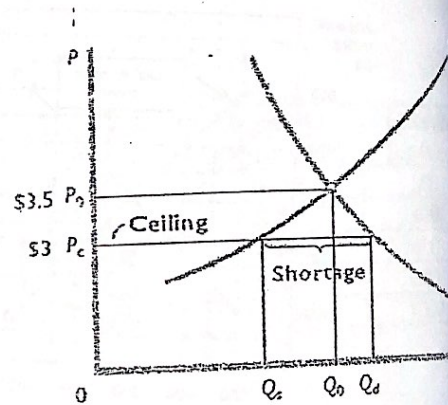
السقف السعري هو أعلى سعر قانوني يسمح أن تباع وتشتري به السلعة. كذلك يمكن أن تباع وتشتري السلعة عند مستوى سعر أقل من السقف السعري. أما أعلى منه فلا يجوز.

A price ceiling is a maximum legal price such as P_c . When the ceiling price is below the equilibrium price, a persistent product shortage results. Here that shortage is shown by the horizontal distance between Q_d and Q_s .

إن نتيجة فرض سقف سعري تكون الكمية المعروضة أقل من الكمية المطلوبة، مما يشير إلى وجود عجز في سوق تلك السلعة. أي أن الحكومة حاولت حل مشكلة ارتفاع السعر، ولكن ذلك على حساب مشكلة العجز الذي ظهر في السوق. ويمكن للحكومة أن تتبع عدة أساليب للتخلص من مشكلة العجز هذه، ومن بين هذه الأساليب أن تقوم الحكومة بتوفير كميات إضافية من السلعة لسد العجز الناجم من السقف السعري. وإذا لم تقم الحكومة بذلك فقد يؤدي وجود العجز الناتج عن فرض سقف سعري إلى ظهور سوق سوداء.

Graphical Analysis (price Ceilings on Gasoline)

Suppose that rapidly rising world income boosts the purchase of automobiles and shifts the demand for gasoline to the right so that the equilibrium or market price reaches \$3.5 per gallon, shown as P_0 in Figure. The rapidly rising price of gasoline greatly burdens low- and moderate-income households, which pressure government to "do something." To keep gasoline affordable for these households, the government imposes a ceiling price P_c of \$3 per gallon. To impact the market, a price ceiling must be below the equilibrium price. A ceiling price of \$4, for example, would have had no immediate effect on the gasoline market.



What are the effects of this \$3 ceiling price? The rationing ability of the free market is rendered ineffective. Because the ceiling price P_c is below the market-clearing price P_0 , there is a lasting shortage of gasoline. The quantity of gasoline demanded at P_c is Q_d and the quantity supplied is only Q_s ; a persistent excess demand or shortage of amount $Q_d - Q_s$ occurs.

الأرضية السعريّة Price Floors

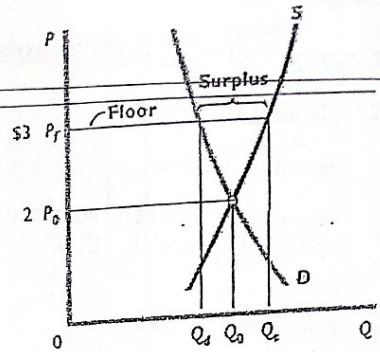
A price floor is a minimum price fixed by the government. A price at or above the price floor is legal; a price below it is not.

يمكن أن تتدخل الحكومة لحماية المنتجين. وعندما تدخل الحكومة في هذا المجال فإنها تفرض عادة سعراً أعلى من سعر التوازن يسمى أرضية سعريه، وهو أدنى سعر قانوني يسمح أن تباع وتشتري به تلك السلعة.

Graphical Analysis (price Floor on Wheat)

A price floor is a minimum legal price such as P_f . When the price floor is above the equilibrium price, a persistent product surplus results. Here that surplus is shown by the horizontal distance between Q_s and Q_d .

Suppose the equilibrium price for wheat is \$2 per bushel and, because of that low price, many farmers have extremely low incomes. The government decides to help out by establishing a legal price floor or price support of \$3 per bushel. What will be the effects? At any price above the equilibrium price, quantity supplied will exceed quantity demanded—that is, there will be a persistent excess supply or surplus of the product. Farmers will be willing to produce and offer for sale more than private buyers are willing to purchase at the price floor.



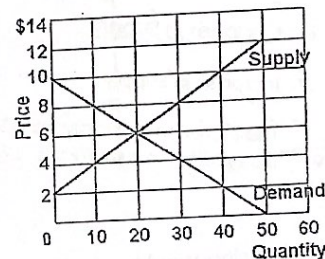
Example

Consider the following market demand and supply curves for Cheese. Quantities are in tons and prices in dollars.

Suppose that government imposed a price floor of \$8, would there be a shortage or a surplus at this price? Why? How much is the size of this shortage or surplus?

Surplus because $Q_s > Q_d$

$$\text{Surplus} = Q_s - Q_d = 30 - 10 = 20 \text{ tons}$$



Multiple choices:

- When a price ceiling is imposed in a market,
 - a persistent shortage results
 - a persistent surplus results
 - sellers of the product are made better off
 - quantity supplied is greater than the quantity demanded
- When a price floor is imposed, it has an impact on a market if it is set
 - below the equilibrium price
 - above the equilibrium price because quantity demanded exceeds quantity supplied
 - above the equilibrium price because quantity supplied exceeds quantity demanded
 - below the equilibrium price because quantity demanded exceeds quantity supplied
- A price ceiling
 - is a legal maximum on the price at which a good can be sold.
 - is a legal minimum on the price at which a good can be sold.
 - Occurs when the price in the market is temporarily above equilibrium.
 - Will usually result in a market surplus.

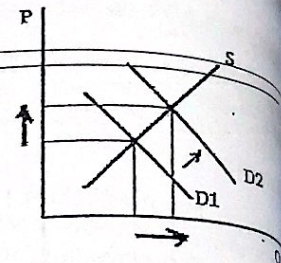
60

Change in Supply; Demand, and Equilibrium

Changes in Demand

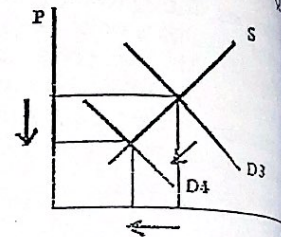
Increase in Demand

The increase in demand from D_1 to D_2 , increase both equilibrium price and equilibrium quantity ($P \uparrow$; $Q \uparrow$)



Decrease in Demand

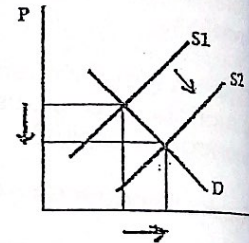
The decrease in demand from D_3 to D_4 , decrease both equilibrium price and equilibrium quantity ($P \downarrow$; $Q \downarrow$)



Changes in Supply

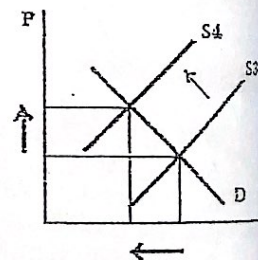
Increase in Supply

The increase in supply from S_1 to S_2 , decrease the equilibrium price and, increase the equilibrium quantity ($P \downarrow$; $Q \uparrow$)



Decrease in Supply

The decrease in supply from S_3 to S_4 , increase the equilibrium price and, decrease the equilibrium quantity ($P \uparrow$; $Q \downarrow$)

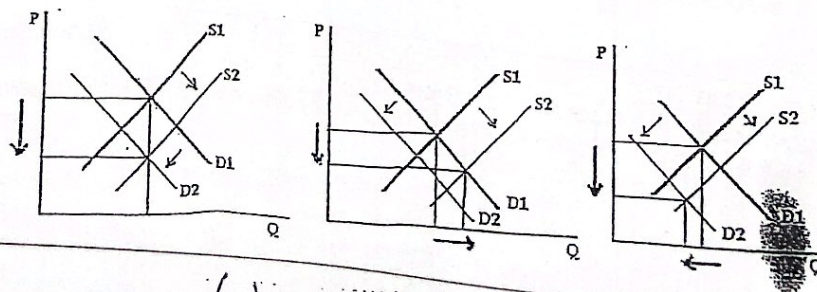


Supply Increase; Demand Decrease

Increase in supply $\Rightarrow Q \uparrow$

Decrease in demand $\Rightarrow Q \downarrow$

Net effect: Q : uncertain (لا يستطيع التحديد)



61

Example

Tea and coffee are substitutes and both tea and coffee are normal goods. Explain what happens to demand, supply, equilibrium price, equilibrium quantity of tea due to the following events.

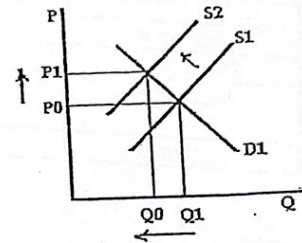
- a. Government increase sales taxes on tea.

Increase sales taxes \Rightarrow decrease supply of tea

The demand for tea: no change.

The price of tea: increase

The quantity of tea: decrease



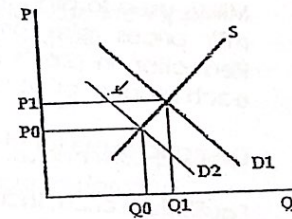
- b. Price of coffee decrease considerably (بشكل كبير)

Tea and coffee are substitutes \Rightarrow Price of coffee decrease leads to increase demand for coffee and decrease demand for tea.

The supply of tea: no change

The price of tea: decrease

The quantity of tea: decrease



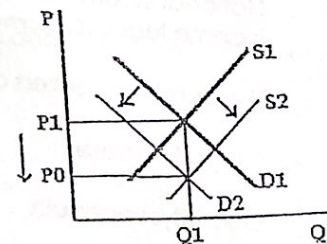
- c. Consumers' income decreases and, at the same time, the cost of producing and transporting tea has also decreased.

Tea is a normal good \Rightarrow Consumers' income decreases leads to decrease the demand for tea

The cost of producing and transporting tea has decreased. \Rightarrow supply of tea increase

The price of tea: decrease

The quantity of tea: uncertain



Effects of changes in both supply and demand

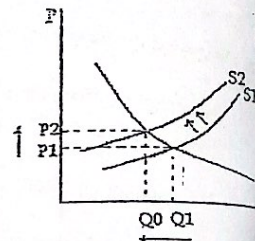
Change in Supply	Change in Demand	Effect on Equilibrium Price	Effect on Equilibrium Quantity
		Decrease	Uncertain
		Increase	Uncertain
Increase	Decrease	Increase	Increase
Decrease	Increase	Uncertain (Indeterminate)	Decrease
Increase	Increase	Uncertain	Decrease
Decrease	Decrease	Uncertain	Decrease

Example

Suppose that cheese is a normal goods, cheese and bread are complements, and milk is used to produce cheese. For each of the following cases, show what happens to demand, supply, equilibrium price, and equilibrium quantity of cheese.

- a. Price of milk increases.

Milk is used to produce cheese (resources of milk production). Increase in milk prices raise production cost, this leads to decrease the profit. Reduction in profits reduces the incentive for firms to supply output at each product price \Rightarrow shift supply curve to the left (decrease).



Demand curve for cheese: No change

Equilibrium price: Increase

Equilibrium quantity: Decrease

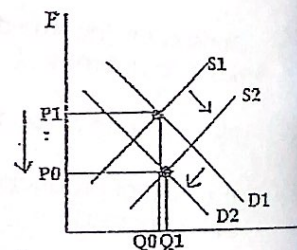
- b. National income decrease and, at the same time, the number of sellers of local cheese has increased.

National income decrease: cheese is a normal goods \Rightarrow decrease income leads to *decrease demand*

The number of sellers of local cheese has increased \Rightarrow *increased supply*

Price: decrease

Quantity: uncertain



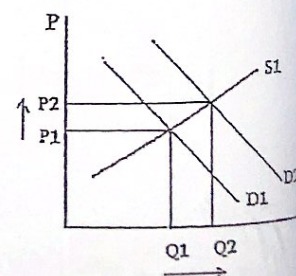
- c. The government gives a subsidy to the producers of bread.

Subsidy to the producers of bread leads to increase the supply of bread \Rightarrow decrease the price of bread, but cheese and bread are complements \Rightarrow *increase the demand for cheese*.

Supply curve for cheese: No change

Price: increase

Quantity: increase



Questions:

Question #1:

Refer to the information provided in table below to answer the questions that follow:

Price per Pizza	Q _d for Pizzas	Q _s for Pizzas
\$3	1,200	600
6	1,000	700
9	800	800
12	600	900
15	400	1,000

- What is the equilibrium price and quantity in Pizza market
- At a price of Pizza \$3, is there be a shortage or surplus? By how much?
- In this market there will be an excess demand of 300 pizzas at which price?
- Suppose the government sets a price floor of \$12. Will there be a shortage or surplus? How large will it be?
- Suppose the government gives subsidies to the producers of pizza that leads to increase the supply of pizza by 300 units at each price level, what is the new equilibrium price and quantity?

Question #2:

Suppose that an mp3 player is normal goods, mp3 players and CDs are complements, and mp3 players and satellite radio are substitutes. For each of the following cases, show what happens to demand, supply, equilibrium price, and equilibrium quantity of mp3 player.

- a decrease in the price of mp3 players
- an increase in the price of CDs
- The government gives a subsidy to the producers of CDs
- a fad that makes mp3 players more popular among 12-25 year olds
- a decrease in the price of satellite radio.

Question #3:

Based on the following table which represents the supply schedule for three sellers and the market demand of Tea.

Price	Firm A's Quantity Supplied	Firm B's Quantity Supplied	Firm C's Quantity Supplied	Market demand
2	2	3	4	54
4	4	6	8	48
6	6	9	12	42
8	8	12	16	36
10	10	15	20	30

- Suppose that there are only three sellers of market of Tea. What is the market supply schedule
- What is the equilibrium price and quantity of Tea in this market?
- When government sets the price of a Tea at \$4, will there be a shortage or surplus? By what amount?

64