Demand and Supply

Learning Objectives

After you have studied demand and supply, you should be able to

1. define demand schedule, quantity demanded, supply schedule, quantity supplied, equilibrium, shortage, and surplus;

2. state both the law of demand and the law of supply;

3. graph demand and supply curves from demand and supply schedules;

4. enumerate five *ceteris paribus* conditions determining demand and five *ceteris paribus* conditions determining supply;

5. predict the effects of a change in the price of one good on the demand for (a) a substitute good, and (b) a complementary good;

6. recognize, from graphs, the difference between a change in demand and a change in quantity demanded, and the difference between a change in supply and a change in quantity supplied;

7. determine from a supply curve and a demand curve what the equilibrium price and the equilibrium quantity will be;

8. explain how markets eliminate surpluses and shortages.

9. define price system, voluntary exchange, terms of exchange, transactions costs, price controls, price ceiling, price floor, nonprice rationing devices, black market, rent control, minimum wage, and import quota;

10. predict what happens to equilibrium price and equilibrium quantity when supply increases or decreases relative to demand, and when demand increases or decreases relative to supply;

11. predict what happens to the relative price of a good or resource if it becomes more or less scarce;

12. differentiate between the causes of short-run and long-run (prolonged) shortages;

13. recognize various methods of rationing goods and services;

14. recognize, from graphs, how a black market emerges;

15. enumerate several consequences of rent control;

16. recognize several consequences of government quantity restrictions;

17. recognize the consequences of price floors and the causes of prolonged surpluses.

Outline

1. The law of demand states that at higher prices a lower quantity will be demanded than at lower prices, other things being equal.

(a) For simplicity, things other than the price of the good itself are held constant.

(b) Buyers respond to changes in relative, not absolute, prices.

2. The demand schedule for a good is a set of pairs of numbers showing various possible prices and the quantity demanded at each price, for some time period.

(a) Demand must be conceived of as being measured in constant-quality units.

(b) A demand curve is a graphical representation of the demand schedule and it is negatively sloped, reflecting the law of demand.

(c) A market demand curve for a particular good or service is derived by summing all the individual demand curves for that product.

3. The determinants of demand include all factors (other than the good's own price) that influence the quantity purchased.

(a) When deriving a demand curve, other determinants of demand are held constant. When such *ceteris paribus* conditions affecting demand do change, the original demand curve shifts to the left or to the right.

(b) The major determinants of demand are consumers' income, tastes and preferences; changes in their expectations about future relative prices; the price of substitutes and complements for the good in question; and the number of buyers.

(c) A change in demand is a shift in the demand curve, whereas a change in quantity demanded is a movement along a given demand curve.

4. Supply is the relationship between price and the quantity supplied, other things being equal.

(a) The law of supply posits generally a direct, or positive, relationship between price and quantity supplied.

i. As the relative price of a good rises, producers have an incentive to produce more of it.

ii. As a firm produces greater quantities in the short run, a firm often requires a higher relative price before it will increase output.

(b) A supply schedule is a set of numbers showing prices and the quantity supplied at those various prices.

(c) A supply curve is the graphical representation of the supply schedule; it is positively sloped.

(d) By summing individual supply curves for a particular good or service we derive the market supply curve for that good or service.

(e) The major determinants of supply are the prices of resources (inputs) used to produce the\ product; technology; taxes and subsidies; price expectations of producers; and the number of firms in an industry.

(f) Any change in the determinants of supply (listed in part (e)) causes a change in supply and therefore leads to a shift in the supply curve.

(g) A change in price, holding the determinants of supply constant, causes a movement along—but not a shift in—the supply curve.

5. By graphing demand and supply on the same coordinate system, we can find equilibrium at the intersection of the two curves.

(a) Equilibrium is a situation in which the plans of buyers and of sellers exactly coincide, so that there is neither excess quantity supplied nor excess quantity demanded; at the equilibrium price, quantity supplied equals quantity demanded.

(b) At a price below the equilibrium price, quantity demanded exceeds quantity supplied, and *excess quantity demanded*, or a shortage, exists.

(c) At a price above the equilibrium price, quantity supplied exceeds quantity demanded, and an *excess quantity supplied*, or a surplus, exists.

(d) Seller competition forces price down and eliminates a surplus.

(e) Buyer competition forces price up and eliminates a shortage.

6. In a price system (free enterprise) voluntary exchange typically determines price; buyers and sellers transact with a minimum amount of governmental interference.

(a) Under a system of voluntary exchange, the terms of exchange (the terms, usually price, under which trade takes place) are set by the forces of supply and demand.

(b) Markets reduce transactions costs (all the costs associated with exchanging, including such costs associated with gathering information and enforcing contracts).

(c) Under voluntary exchange *both* buyers and sellers are presumed to benefit—otherwise the transactions would not continue.

7. Changes in demand and/or supply lead to changes in the equilibrium price and the equilibrium quantity.

(a) If demand shifts to the right (left), given supply, then the equilibrium price rises (falls) and the equilibrium quantity rises (falls).

(b) If supply shifts to the right (left), given demand, then the equilibrium price falls (rises) and the equilibrium quantity rises (falls).

(c) When both supply and demand change, it is not always possible to predict the effects on the equilibrium price and the equilibrium quantity.

8. Prices are not always perfectly flexible.

(a) If prices are inflexible, published prices will not change very much, but such hidden price rises as a quality reduction might occur.

(b) Markets do not always move to equilibrium (given a change in demand or supply) immediately; hence shortages can emerge in the short run.

9. Price reflects relative scarcity and performs a rationing function.

(a) If an input or output becomes less scarce (more scarce), its relative price will fall (rise).

(b) If governments prevent prices from rising to their equilibrium level, via a price control or ceiling, then goods cannot (legally) be allocated to the highest bidders and prolonged shortages result; other forms of rationing emerge.

(c) During prolonged shortages, such nonprice rationing devices as cheating, long lines, first-come first-served, political power, physical force, and other nonmarket forces arise.

(d) Governments also interfere in markets by putting price floors on price; for example, governments impose minimum wage rates, and they have put price floors on agricultural goods, which have caused surpluses.

10. Rent controls are governmentally imposed price ceilings on rental apartments, which lead to predictable results; nonprice rationing for apartments results.

11. The government has put price floors in several markets.

(a) For many years, price supports created minimum prices for agricultural goods.

(b) When the government sets minimum wages above the equilibrium, some unemployment is created.

(c) Governments sometimes restrict quantity directly through import quotas, which prohibit the importation of more than a specified quantity of a particular good in a one-year period.

Key Terms

Demand schedule Supply curve Market
Demand curve Market price Money price
Supply schedule Market demand
Price ceiling Price floor Black market
Transactions costs Minimum wage Import quota

Key Concepts

Relative price Substitutes Equilibrium
Law of demand Subsidy Shortage, or excess quantity demanded
Normal goods Complements Surplus, or excess quantity supplied
Inferior goods Law of supply
Price controls Rent control Price system
Voluntary exchange Terms of exchange Nonprice rationing devices

Completion Questions

Fill in the blank, or circle the correct term.
1. A(n) ________________________________ relates various possible prices to the quantities demanded at each price, and a(n) ____________________________ relates various prices to the quantities supplied at each price.

2. A change in quantity demanded is a (movement along, shift in) the demand curve; and a change in demand is a(n) ______________________________ the demand curve.

3. At the intersection of the supply and demand curves, the quantity supplied equals the quantity demanded, and at that price a(n) _______________________________ exists; at a price above that intersection, quantity supplied exceeds quantity demanded and a(n) ______________ exists; at a price below that intersection, quantity demanded exceeds quantity supplied, and a(n) __________________________ exists.

4. The law of demand states that, other things being equal, more items are purchased at a (lower, higher) price and fewer are purchased at a(n) _____________ price.

5. There is (a direct, an inverse) relationship between price and quantity demanded, and demand curves will be (positively, negatively) sloped.

6. When the other determinants of demand change, the entire demand curve shifts; the five major *ceteris paribus* conditions affecting demand are __________________________________, ________________________, __________________ , _________________________________ , and _____________________.

7. If the demand for pizzas rises, given the supply, then the equilibrium price of pizza will (rise, fall) and the equilibrium quantity of pizzas purchased will __________.

8. The law of supply relates prices to quantities supplied; in general, as price rises, quantity supplied _______________. Therefore (a direct, an inverse) relationship exists, and the supply curve is (positively, negatively) sloped.

9. The supply curve is positively sloped because as price rises, producers have an incentive to produce (less, more)

10. When the determinants of supply change, the entire supply curve will shift; five major determinants of supply are _________, ______, ___________,__________, and _______________.

11. Movie DVDs and DVD players are (substitutes, complements); if the price of DVD players rises, then the demand for movie DVDs will ____.

12. When the price of peaches rises, the demand for pears rises; peaches and pears are (substitutes, complements).

13. *Analogy*: An excess quantity supplied is to a surplus as a(n) _____________________is to a shortage.

14. A rise in demand causes the demand curve to shift to the (left, right); an increase in quantity demanded occurs when there is a movement (up, down) the demand curve.

15. By convention, economists plot (price, quantity) on the vertical axis and (price, quantity) on the horizontal axis.

16. Resources are scarce; therefore we cannot have all we want at a (zero, positive) price and there will be various ways in which people will ____________________ for resources.

17. If demand shifts to the left, given supply, then the equilibrium price will (rise, fall) and the equilibrium quantity will ______________.

18. If supply shifts to the right, given demand, then the equilibrium price will _______and the equilibrium quantity will _________.

19. If both demand and supply shift to the right, then the equilibrium price (will rise, will fall, is indeterminate) and the equilibrium quantity (will rise, will fall, is indeterminate).

20. If both demand and supply shift to the left, then the equilibrium price (will rise, will fall, is indeterminate), and the equilibrium quantity (will rise, will fall, is indeterminate).

21. If the demand for good A or resource A rises relative to its supply, A has become relatively (less scarce, more scarce) and its relative price will (rise, fall); if the demand for good B or resource B falls relative to its supply, then B has become relatively ___________________________, and its relative price will __________________.

22. If the published price of good A remains constant, but its quality falls, then its relative price has actually (risen, fallen). If the published price of good A remains constant, but people have to wait in line to get it, then the relative price of good A has actually ___________, because people have an opportunity cost for their__________.

23. If the demand for a good rises relative to its supply, that good becomes (less scarce, more scarce) and its relative price will (rise, fall); this leads to (a decrease, an increase) in the quantity of the good supplied by producers of the item.

24. Price performs a(n) _________________ function; inputs or outputs go to the __________ bidders, if people are free to exchange voluntarily in markets. If such economic freedoms do not exist, then other (price, nonprice) determinants will allocate goods and services.

25. Price controls that put a price ceiling on goods and services create (surpluses, shortages); and price floors create (surpluses, shortages).

26. If governments place price (floors, ceilings) on goods, then black markets might emerge.

27. Rent control is a form of price (floor, ceiling); rent control (increases, reduces) the future supply of apartment construction, (increases, reduces) tenant mobility, (improves, causes a deterioration in) the quality of the existing stock of apartments, and hurts _____________.

28. By prohibiting the sale and use of tobacco products, the government would cause the supply of cigarettes to shift to the (left, right), make cigarettes (more, less) scarce, and cause their relative price to (rise, fall)

29. Import quotas, licensing arrangements, and outright bans on specific goods are forms of government (price, quantity) restrictions.

30. An import quota tends to (lower, raise) price to consumers.

31. If governments put price floors on agricultural goods, a (shortage, surplus) will result.

Multiple Choice Questions

Circle the letter that corresponds to the best answer.

1. A demand schedule
(a) relates price to quantity supplied.
(b) when graphed, is a demand curve.
(c) cannot change.
(d) shows a direct relationship between price and quantity demanded.

2. If the price of milk rises, other things being constant,
(a) buyers will drink less milk.
(b) buyers will substitute milk for other beverages.
(c) the demand for milk will fall.
(d) the demand for cola drinks will fall.

3. Which of the following will **not** occur if the price of widescreen digital televisions falls, other things being constant?
(a) The demand for digital cable services will increase.
(b) People will substitute widescreen digital televisions for standard televisions.
(c) The demand for standard televisions will rise.
(d) The quantity of widescreen digital televisions demanded will increase.

4. If the price of good A rises and the demand for good B rises, then A and B are
(a) substitutes. (b) complements. (c) not related goods. (d) not scarce goods.

5. Consider a city that establishes a law prohibiting the use of lawn sprinklers and limiting showers to 4 minutes. Which of the following statements is probably true in this city?
(a) A surplus of water exists.
(b) The price of water is too high.
(c) A shortage of water exists regardless of how high its price got.
(d) The price of water is below the equilibrium price.

6. If the supply of gasoline rises, with a given demand, then
(a) the relative price of gasoline will rise.
(b) the equilibrium price of gasoline will rise.
(c) the equilibrium quantity of gasoline will increase.
(d) the equilibrium price and equilibrium quantity of gasoline will increase.

7. If income falls and the demand for widescreen digital televisions falls, then widescreen digital televisions are a(n)
(a) substitute good. (b) complement good. (c) normal good. (d) inferior good.

8. If the demand for satellite Internet access services increases, with a given supply, then
(a) the supply of satellite Internet access services will rise because price rises.
(b) the equilibrium price of satellite Internet access services will fall, and the equilibrium quantity will rise.
(c) the equilibrium quantity and the equilibrium price of satellite Internet access services will rise.
(d) the quantity supplied of satellite Internet access services will decrease.

9. If a shortage exists at some price, then
(a) sellers can sell all they desire to sell at that price. (b) sellers have an incentive to raise the price.
(c) buyers cannot get all they want at that price. (d) All of the above

10. Which of the following will lead to a rise in supply?
(a) an increase in the price of the good in question.
(b) a technological improvement in the production of the good in question.
(c) an increase in the price of labor used to produce the good in question.
(d) All of the above

11. Which of the following probably will **not** lead to a fall in the demand for hamburgers?
(a) a decrease in income, if hamburgers are a normal good.
(b) an expectation that the price of hamburgers will rise in the future.
(c) a decrease in the price of hot dogs.
(d) a change in tastes away from hamburgers.

12. When a demand curve is derived,
(a) quantity is in constant-quality units. (b) the price of the good is held constant.
(c) money income changes. (d) consumer tastes change.

13. If a surplus exists at some price, then
(a) sellers have an incentive to raise the price.
(b) buyers have an incentive to offer a higher price.
(c) sellers cannot sell all they wish to at that price.
(d) seller inventories are falling.

14. Because resources are scarce,
(a) buyers compete with buyers for outputs.
(b) there must be some method for rationing goods.
(c) people cannot have all they want at a zero price.
(d) All of the above

15. If markets are free and prices are flexible,
(a) equilibrium price cannot be established.
(b) shortages and surpluses eventually disappear.
(c) shortages and surpluses can't arise.
(d) equilibrium quantity cannot be established.

16. If demand shifts to the right (given supply), then equilibrium
(a) quantity will rise.
(b) price is indeterminate.
(c) price and equilibrium quantity are indeterminate.
(d) price will fall.

17. If supply shifts to the right (given demand), then equilibrium
(a) quantity will rise.
(b) price will rise.
(c) price and equilibrium quantity will fall.
(d) price and equilibrium quantity rises.

18. If both supply and demand shift to the left, then equilibrium
(a) price is indeterminate and equilibrium quantity rises.
(b) price is indeterminate and equilibrium quantity falls.
(c) price falls and equilibrium quantity falls.
(d) price falls and equilibrium quantity is indeterminate.

19. If the demand for good A falls relative to its supply, then
(a) good A is now relatively more scarce.
(b) good A is now relatively less scarce.
(c) the relative price of good A will rise.
(d) the total price of good A will rise, even if A is not price flexible.

20. If the demand for good B rises relative to its supply, then
(a) good B is now relatively more scarce.
(b) the relative price of good B will rise.
(c) the total price of good B will rise, even if good B is price inflexible.
(d) All of the above

21. If the demand for good A rises relative to its supply, and markets are price flexible, then
(a) no shortage of A can exist in the long run.
(b) no shortage of A can exist in the short run.
(c) the published price of A remains constant, but its total price falls.
(d) the published price of A remains constant, but its total price rises.

22. If the demand for good A rises relative to its supply, and markets are price inflexible, then
(a) a shortage can exist in the short run.
(b) a shortage can exist in the long run.
(c) the published price of A might remain constant, but its total price rises.
(d) All of the above

23. If the demand for economists falls relative to their supply, then
(a) more college students will major in economics.
(b) some economists will change professions.
(c) a shortage of economists will result, in the long run.
(d) All of the above

24. Which of the following can influence how a society rations a specific good?
(a) price system that rations to the highest bidder
(b) political power
(c) religion
(d) All of the above

25. Prolonged shortages arise if
(a) demand increases relative to supply.
(b) price floors are set by governments.
(c) prices are not allowed to rise to equilibrium.
(d) buyers are allowed to compete for goods.

26. Black markets may arise if
(a) price ceilings exist.
(b) price floors exist.
(c) governments do not intervene in the market.
(d) equilibrium price is too low.

27. Rent controls
(a) are a form of price floor.
(b) help the homeless who need apartments.
(c) make tenants less mobile.
(d) reduce litigation in society.

28. If an effective minimum wage is imposed, then
(a) more workers will be unable to find jobs.
(b) the quantity of labor demanded will fall.
(c) some workers will move to sectors not covered by minimum wages.
(d) All of the above

29. Prolonged agricultural surpluses can arise if governments
(a) set price above equilibrium.
(b) institute price floors, or price supports.
(c) purchase the excess supply.
(d) All of the above

Answers

Completion Questions

1. demand curve or schedule; supply curve
or schedule
2. movement along; shift in
3. equilibrium; surplus; shortage
4. lower; higher
5. inverse; negatively
6. income, tastes and preferences, prices of related goods, expectations about future relative prices, number of buyers
7. rise; rise
8. increases; direct; positively
9. more
10. prices of inputs, technology, taxes and subsidies, price expectations, number of firms in industry
11. complements; fall
12. substitutes
13. excess quantity demanded
14. right; down
15. price; quantity
16. zero; compete
17. fall; fall
18. fall; rise
19. is indeterminate; will rise
20. is indeterminate; will fall
21. more scarce; rise; less scarce; fall
22. risen; risen; time
23. more scarce; rise; increase
24. rationing; highest; nonprice
25. shortages; surpluses
26. ceilings
27. ceiling; reduces; reduces; causes a deterioration in; landlords and low income apartment hunters
28. left; more; rise
29. quantity
30. raise
31. surplus

Multiple Choice Questions

1. (b)	2. (a)	3. (c)	4. (a)	5. (d)	6. (c)	7. (c)
8. (c)	9. (d)	10. (b)	11. (b)	12. (a)	13. (c)	14. (d)
15. (b)	16. (a)	17. (a)	18. (b)	19. (b)	20. (d)	21. (a)
22. (d)	23. (b)	24. (d)	25. (c)	26. (a)	27. (c)	28. (d)
29. (d)						

Glossary

Black market A market in which goods are traded at prices above their legal maximum prices or in which illegal goods are sold.

***Ceteris paribus* conditions** Determinants of the relationship between price and quantity that are unchanged along a curve; changes in these factors cause the curve to shift.

Complements Two goods are complements if both are used together for consumption or enjoyment— for example, coffee and cream. The more you buy of one, the more you buy of the other. For complements, a change in the price of one causes an opposite shift in the demand for the other.

Demand A schedule of how much of a good or service people will purchase at any price during a specified time period, other things being constant.

Demand curve A graphical representation of the demand schedule; a negatively sloped line showing the inverse relationship between the price and the quantity demanded (other things being equal).

Equilibrium The situation when quantity supplied equals quantity demanded at a particular price.

Import quota A physical supply restriction on imports of a particular good, such as sugar. Foreign exporters are unable to sell in the United States more than the quantity specified in the import quota.

Inferior goods Goods for which demand falls as income rises.

Law of demand The observation that there is a negative, or inverse, relationship between the price of any good or service and the quantity demanded, holding other factors constant.

Law of supply The observation that the higher the price of a good, the more of that good sellers will make available over a specified time period, other things being equal.

Market All of the arrangements that individuals have for exchanging with one another. Thus we can speak of the labor market, the automobile market, and the credit market.

Market clearing, or equilibrium, price The price that clears the market, at which quantity demanded equals quantity supplied; the price where the demand curve intersects the supply curve.

Market demand The demand of all consumers in the marketplace for a particular good or service. The summing at each price of the quantity demanded by each individual.

Minimum wage A wage floor, legislated by government, setting the lowest hourly rate that firms may legally pay workers.

Money price That price that we observe today in terms of today's dollars; also called the *absolute* or, *nominal* price.

Nonprice rationing devices All methods used to ration scarce goods that are price-controlled. Whenever the price system is not allowed to work, nonprice rationing devices will evolve to ration the affected goods and services.

Normal goods Goods for which demand rises as income rises. Most goods are normal goods.

Price ceiling A legal maximum price that may be charged for a particular good or service.

Price controls Government-mandated minimum or maximum prices that may be charged for goods and services.

Price floor A legal minimum price below which a good or service may not be sold. Legal minimum wages are an example.

Price system An economic system in which relative prices are constantly changing to reflect changes in supply and demand for different commodities. The prices of those commodities are signals to everyone within the system about what is relatively scarce and what is relatively abundant.

Relative price The price of one commodity divided by the price of another commodity; the number of units of one commodity that must be sacrificed to purchase one unit of another commodity.

Rent control The placement of price ceilings on rents in particular cities.

Shortage A situation in which quantity demanded is greater than quantity supplied at a price below the market clearing price.

Subsidy A negative tax; a payment to a producer from the government, usually in the form of a cash grant per unit.

Substitutes Two goods are substitutes when either one can be used for consumption to satisfy a similar want—for example, coffee and tea. The more you buy of one, the less you buy of the other. For substitutes, the change in the price of one causes a shift in demand for the other in the same direction as the price change.

Supply A schedule showing the relationship between price and quantity supplied for a specified period of time, other things being equal.

Supply curve The graphical representation of the supply schedule; a line (curve) showing the supply schedule, which generally slopes upward (has a positive slope), other things being equal.

Surplus A situation in which quantity supplied is greater than quantity demanded at a price above the market clearing price.

Terms of exchange The conditions under which trading takes place. Usually, the terms of exchange are equal to the price at which a good is traded.

Transaction costs All of the costs associated with exchanging, including the informational costs of finding out price and quality, service record, and durability of a product, plus the cost of contracting and enforcing that contract.

Voluntary exchange An act of trading, done on a voluntary basis, in which both parties to the trade are subjectively better off after the exchange.