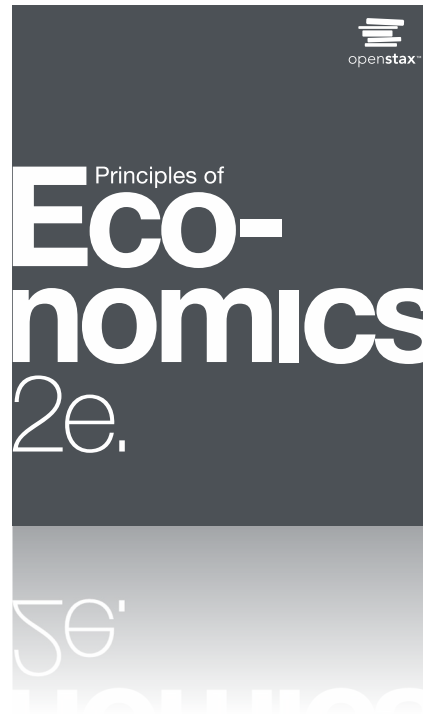


PRINCIPLES OF ECONOMICS 2e

Chapter 3 Demand and Supply



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CH.3 OUTLINE

3.1 Product Markets (Goods and Services):

Demand, Supply, and Equilibrium

3.2: Shifts in Demand and Supply

3.3: Changes in Equilibrium: Four-Step Process

3.4: Price Ceilings and Price Floors

3.5: Demand, Supply, and Efficiency

Why Does It Cost More?



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Since transportation costs are less, shouldn't organic vegetables and fruits that are grown and sold within a specific geographical region cost less than conventional produce grown far away? That is not usually the case. Why? The answer is demand and supply.

3.1 Demand, Supply, and Equilibrium

- **Demand** - the amount of some good or service consumers are willing and able to purchase at each price.
- **Price** - what a buyer pays for one unit of the good or service.
- **Quantity demanded** - the total number of units of a good or service consumers are willing to purchase at a given price
- **Law of demand:** if all other variables that affect demand are constant,
 - if price rises \uparrow , then quantity demanded falls \downarrow
 - if price falls \downarrow , then quantity demanded rises \uparrow

Demand Schedule vs Demand Curve

- **Demand schedule:** a table that shows a few prices for a good or service along with the quantity demanded at each price.
- **Demand curve:** a graphical plot of the relationship between price of a good or service and the quantity demanded at each price. (Note: economists draw the quantity on the horizontal axis and the price on the vertical axis.)

An Individual's Demand Schedule

My Demand Schedule:

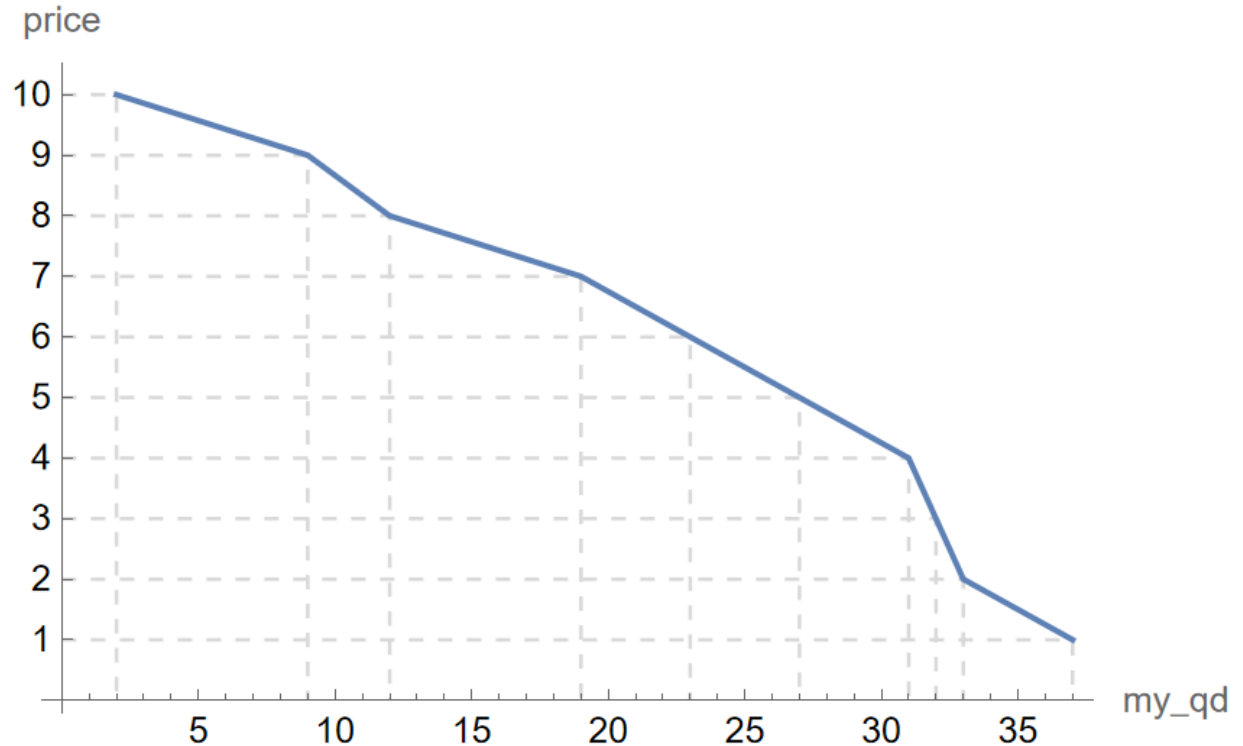
Monthly Demand for Latte

<u>\$price</u>	<u>my_qd</u>
1	37
2	33
3	32
4	31
5	27
6	23
7	19
8	12
9	9
10	2

As the price per latte rises, my quantity demanded falls.

An Individual's Demand Curve

<u>price</u>	<u>my_qd</u>
1	37
2	33
3	32
4	31
5	27
6	23
7	19
8	12
9	9
10	2



Draw a line between each price-quantity pair found in the demand schedule in order to produce this individual's demand curve. The downward slope illustrates the Law of Demand.

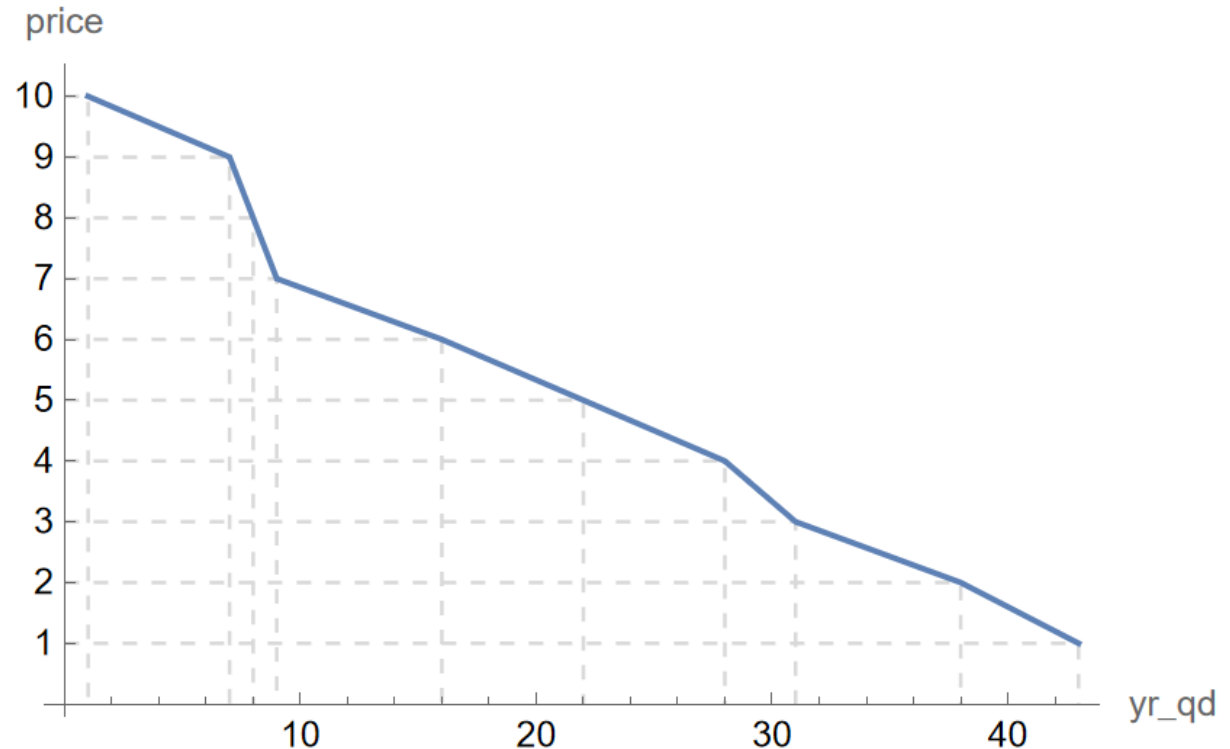
Another Individual's Demand Schedule

<u>price</u>	<u>yr_qd</u>
1	43
2	38
3	31
4	28
5	22
6	16
7	9
8	8
9	7
10	1

As the price per latte rises, your quantity demanded falls.

Another Individual's Demand Curve

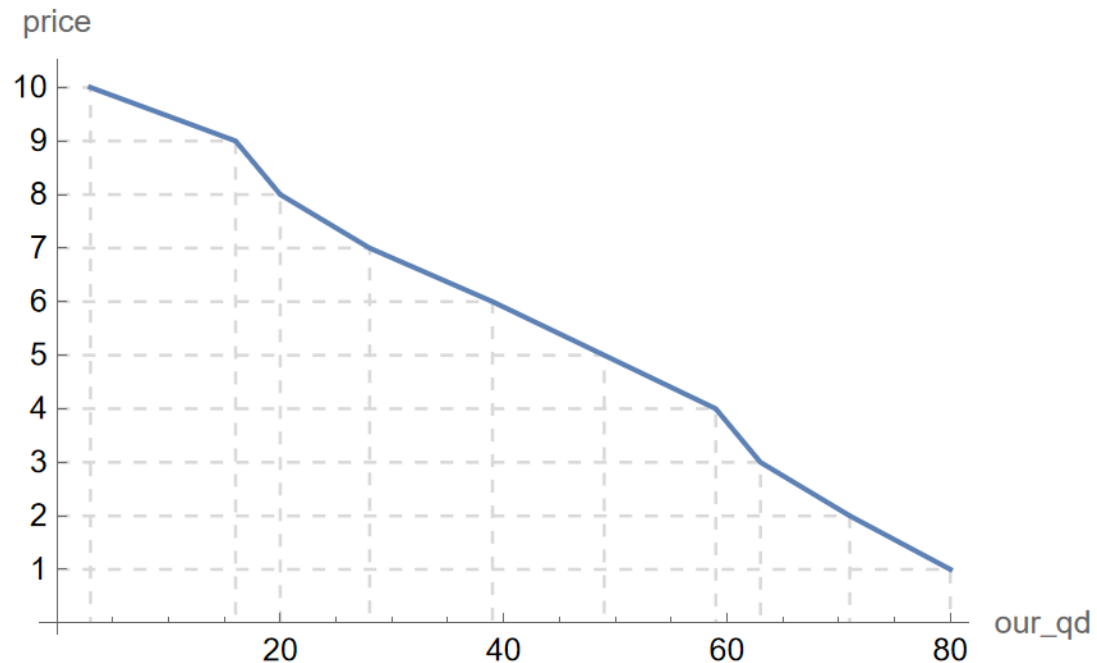
<u>price</u>	<u>yr_qd</u>
1	43
2	38
3	31
4	28
5	22
6	16
7	9
8	8
9	7
10	1



Once again, draw a line between each price-quantity pair found in the demand schedule in order to produce this individual's demand curve. The downward slope illustrates the Law of Demand.

Market Demand

<u>price</u>	<u>our_qd</u>
1	80
2	71
3	63
4	59
5	49
6	39
7	28
8	20
9	16
10	3



Market demand sums all the individual demands *at each price*.

The downward slope of individual demands ensures that market demand slopes down, satisfying the Law of Demand.

Does the Market Demand for Gasoline Respond to Price?

Yes!

E.g., using data for Japan, Knittel and Tanaka find that about 4/5 of the short-run reduction in fuel consumption in response to higher gasoline prices results from fewer miles driven, while 1/5 results from changes in driver behavior (e.g., gas-saving driving style or better vehicle maintenance).

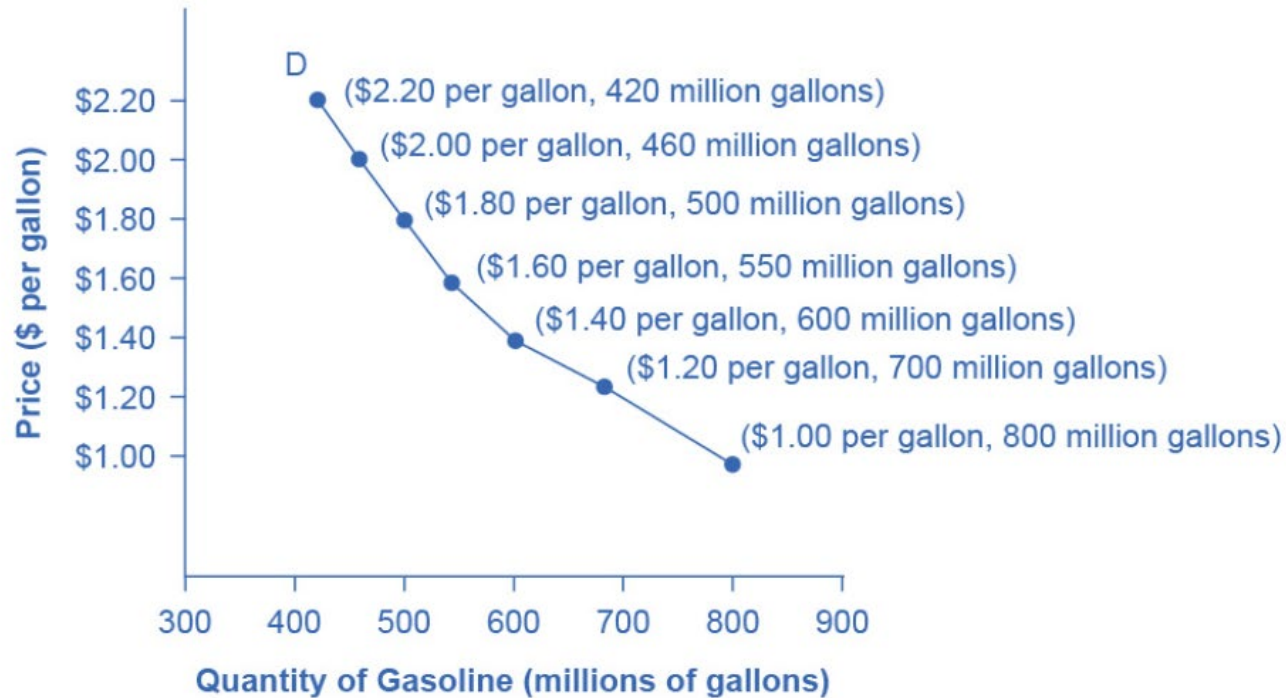
Optional references:

[Gasoline demand more responsive to price changes than economists once thought - Dallasfed.org](https://www.dallasfed.org/outlook/2020/04/01/gasoline-demand-more-responsive-to-price-changes-than-economists-once-thought)

[202021R.pdf \(ucr.edu\) https://economics.ucr.edu/repec/ucr/wpaper/202021R.pdf](https://economics.ucr.edu/repec/ucr/wpaper/202021R.pdf)

[High Frequency Evidence on the Demand for Gasoline \(nber.org\)
https://www.nber.org/system/files/working_papers/w22345/w22345.pdf](https://www.nber.org/system/files/working_papers/w22345/w22345.pdf)

Imaginary Market Demand for Gasoline



The downward slope illustrates the Law of Demand.

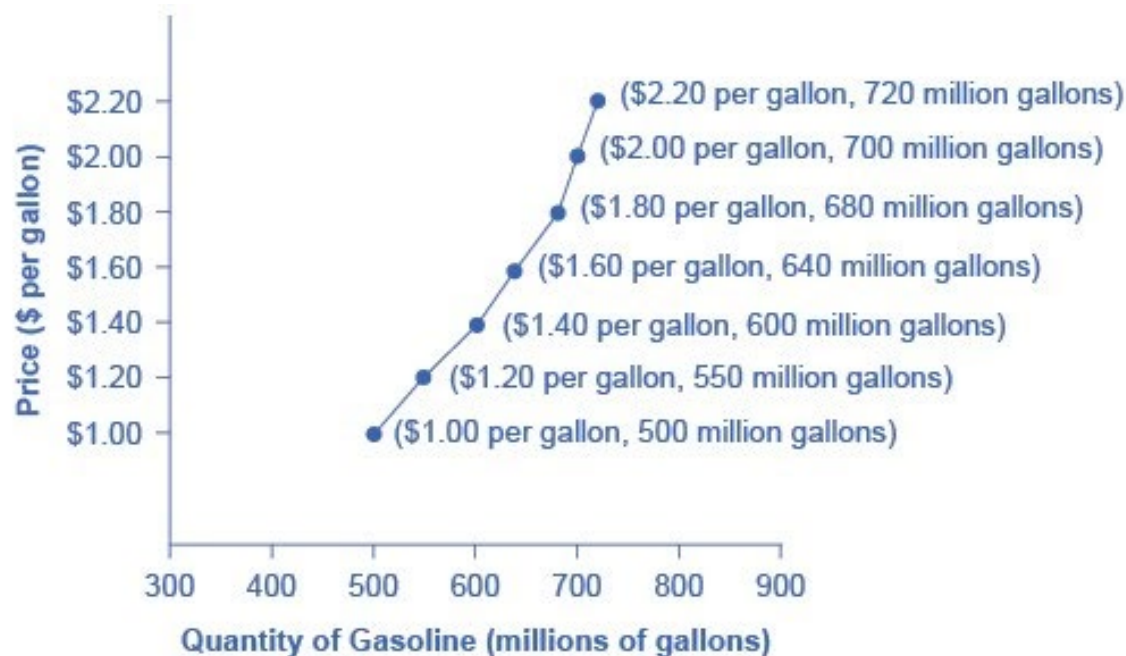
Supply of Goods and Services

- **Supply:** the amount of some good or service producers are willing to supply at each price.
- **Quantity supplied** - the total number of units of a good or service producers are willing to sell at a given price.
- **Law of supply:** if all other variables that affect demand are constant,
 - if price rises \uparrow , then quantity supplied rises \uparrow
 - if price falls \downarrow , then quantity supplied falls \downarrow

Supply Schedule & Curve

- **Supply schedule:**
 - a table showing the quantity supplied at select prices.
- **Supply curve:**
 - a graphic illustration of the relationship between price, shown on the vertical axis, and quantity, shown on the horizontal axis.

Graphing the Market Supply of Gasoline



- The supply curve (S) is created by graphing the points from a supply schedule and then connecting them.
- The *upward* slope of the supply curve illustrates the law of supply - that a higher price leads to a higher quantity supplied, and vice versa.

Equilibrium - Where Demand and Supply Intersect

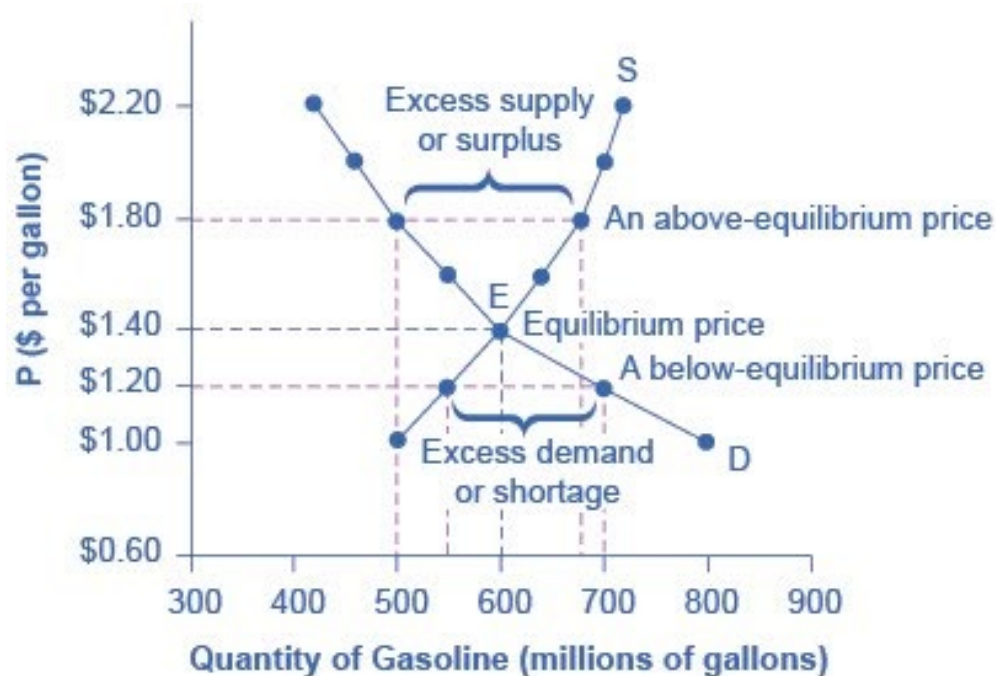


- **Equilibrium** - the combination of price and quantity where there is no economic pressure from surpluses or shortages that would cause price or quantity to change

$$\text{quantity demanded} = \text{quantity supplied}$$

- **Equilibrium price** - the price where quantity demanded is equal to quantity supplied
- **Equilibrium quantity** - the quantity at which quantity demanded and quantity supplied are equal for a certain price level.
- **Surplus** or **excess supply** - at the existing price, quantity supplied exceeds the quantity demanded.
- **Shortage** or **excess demand** - at the existing price, the quantity demanded exceeds the quantity supplied.

Equilibrium - Where Demand and Supply Intersect

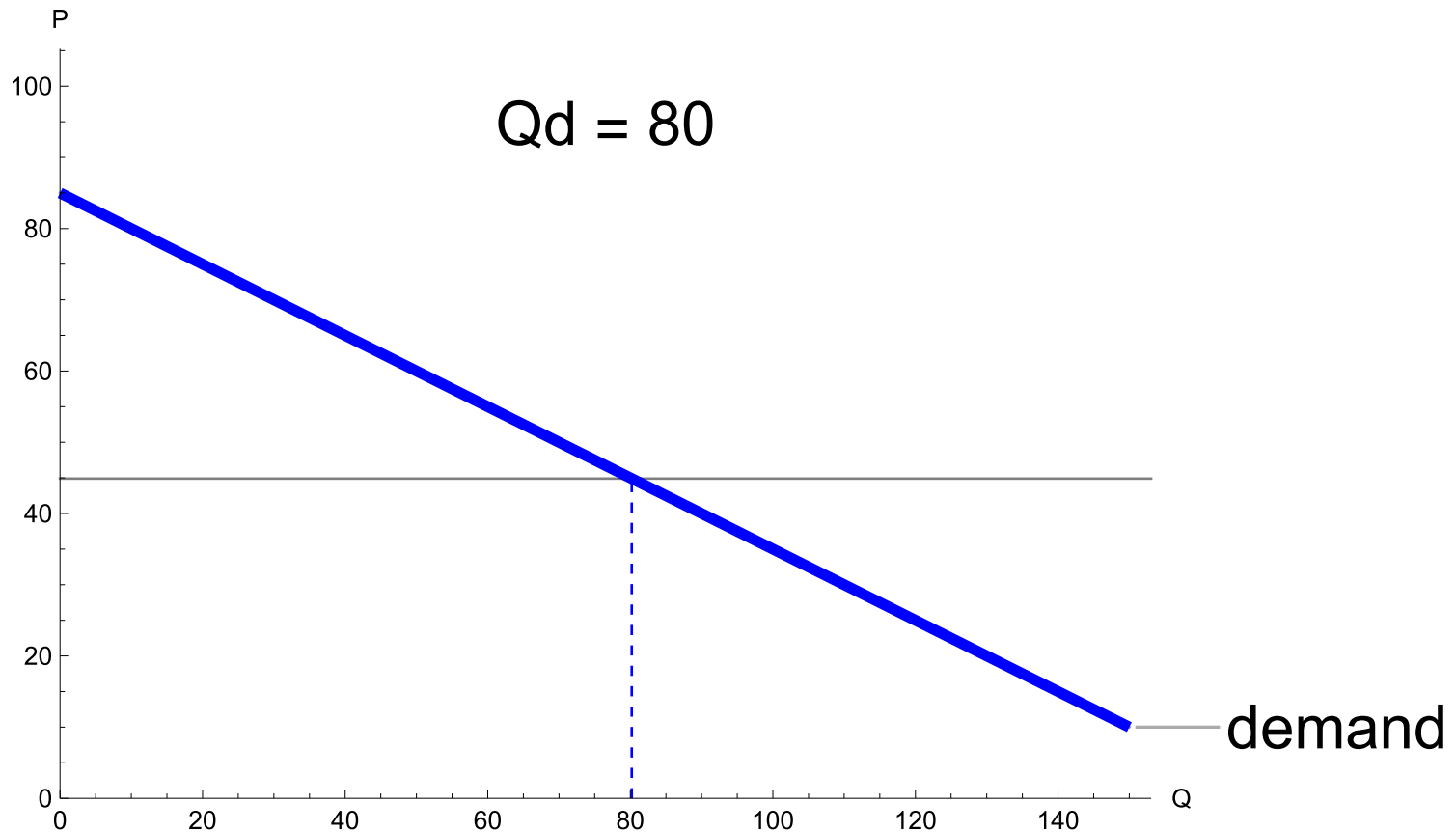


- The demand curve (D) and the supply curve (S) intersect at the **equilibrium** point E.
- The equilibrium price is the only price where,
 quantity demanded = quantity supplied
- At a price above equilibrium, quantity supplied > quantity demanded, so there is excess supply.
- At a price below equilibrium, quantity demanded > quantity supplied, so there is excess demand.

3.2 Shifts in Demand and Supply for Goods and Services

- **Ceteris paribus** - Latin phrase meaning “other things being equal”
- Any given demand or supply curve is based on the ceteris paribus assumption that all else is held equal.

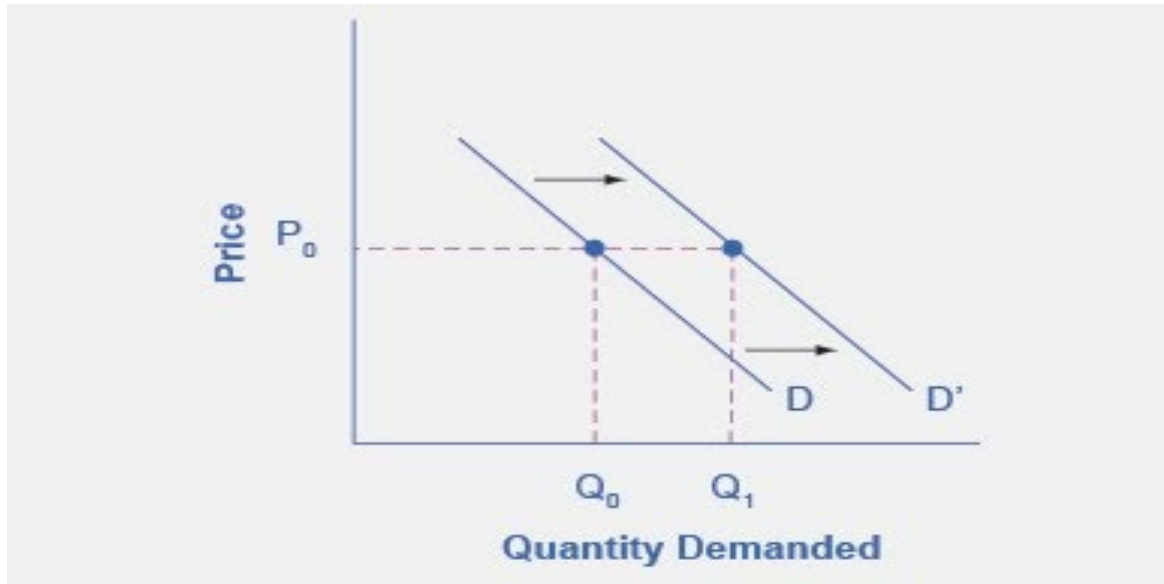
Demand Curve



A demand curve shows how much consumers would buy at each price.

For a particular price, use the demand curve to find the quantity demanded at that price.

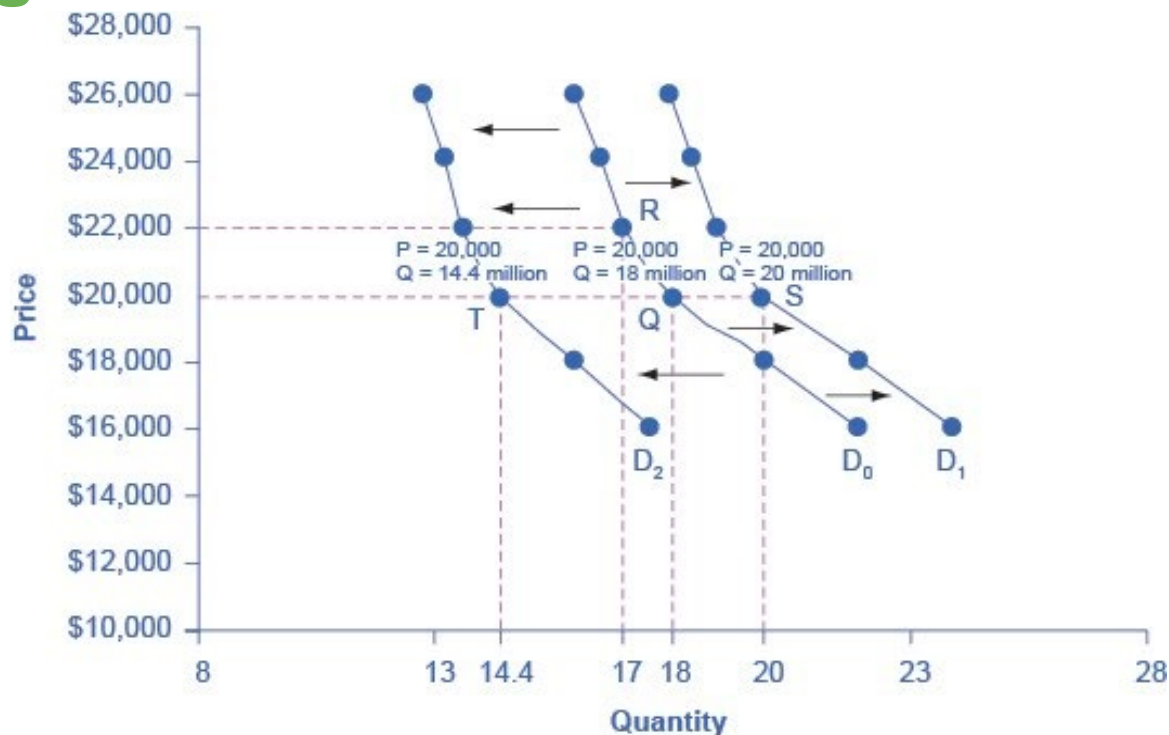
Shifting the Demand Curve



If **income** increases:

- Consumers will purchase larger quantities at the same price.
- The demand curve shifts right.

Shifting the Demand Curve



- Increased demand: at each price, the quantity demanded is higher,
 - the demand curve shifts to the *right* from D_0 to D_1 .
- Decreased demand: at each price, the quantity demanded is lower,
 - the demand curve shifts to the *left* from D_0 to D_2 .



What Factors Affect Demand?

- A **shift in demand** happens when a change in some economic factor (other than price) causes a different quantity to be demanded at every price.
- Factors that affect demand:
 - Income
 - Changing tastes or preferences
 - Changes in the composition of the population
 - Price of substitute or complement changes
 - Changes in expectations about future

How Factors Affect Demand



(a) Factors that increase demand



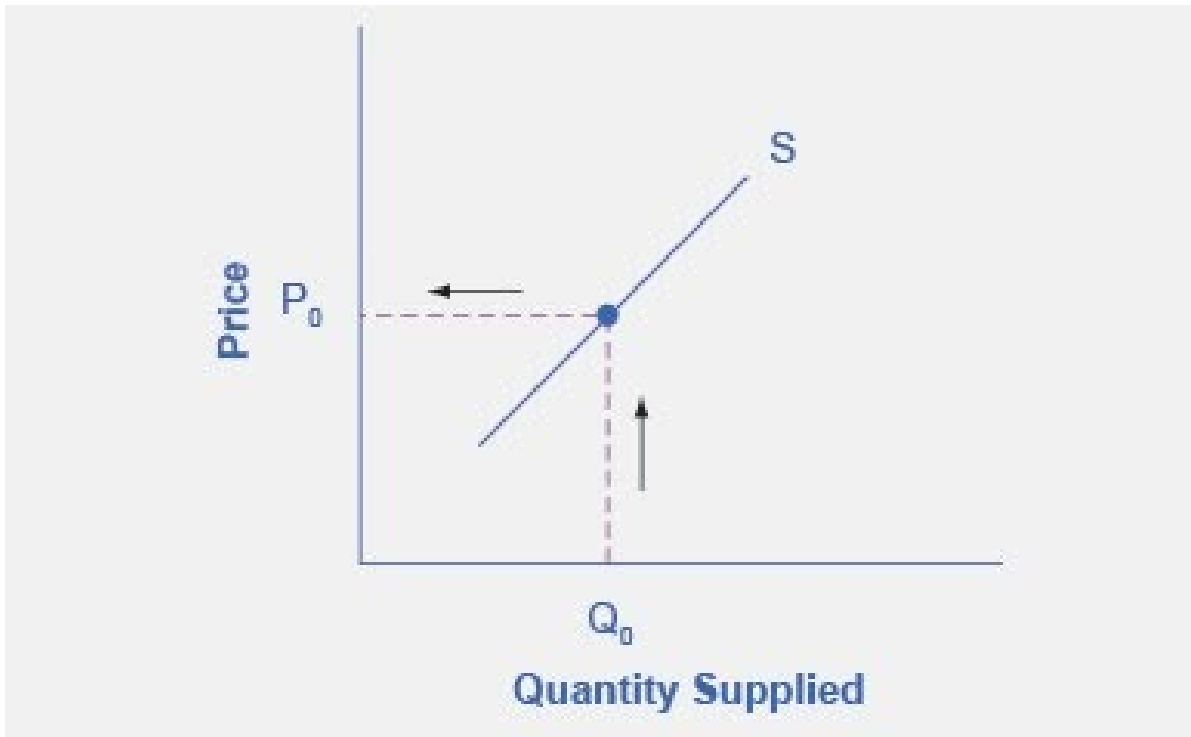
(b) Factors that decrease demand

- (a) A list of factors that can cause an increase in demand from D_0 to D_1 .
- (b) The same factors, if their direction is reversed, can cause a decrease in demand from D_0 to D_1 .

Types of Goods & Services

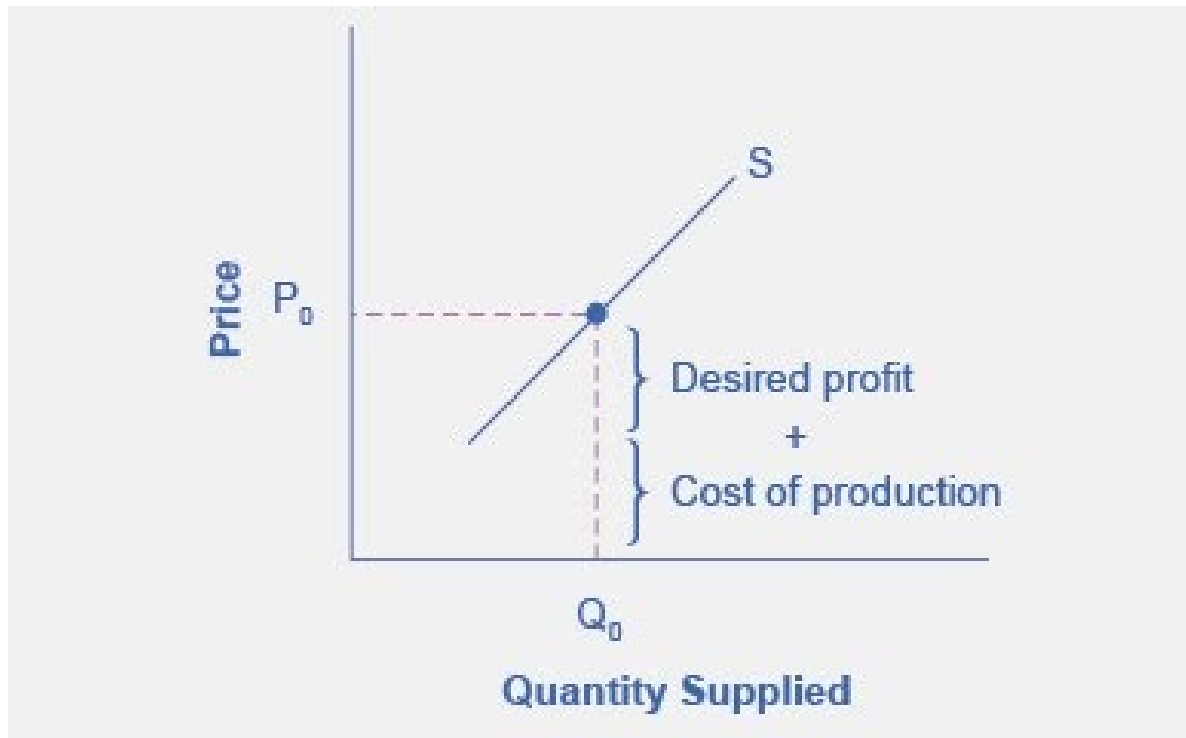
- **Normal good** - A product whose demand rises when income rises, and vice versa.
- **Inferior good** - A product whose demand falls when income rises, rises, and vice versa.
- **Substitute** - a good or service that we can use in place of another good or service.
- **Complements** - goods or services that are often used together so that consumption of one good tends to enhance consumption of the other.

Supply Curve



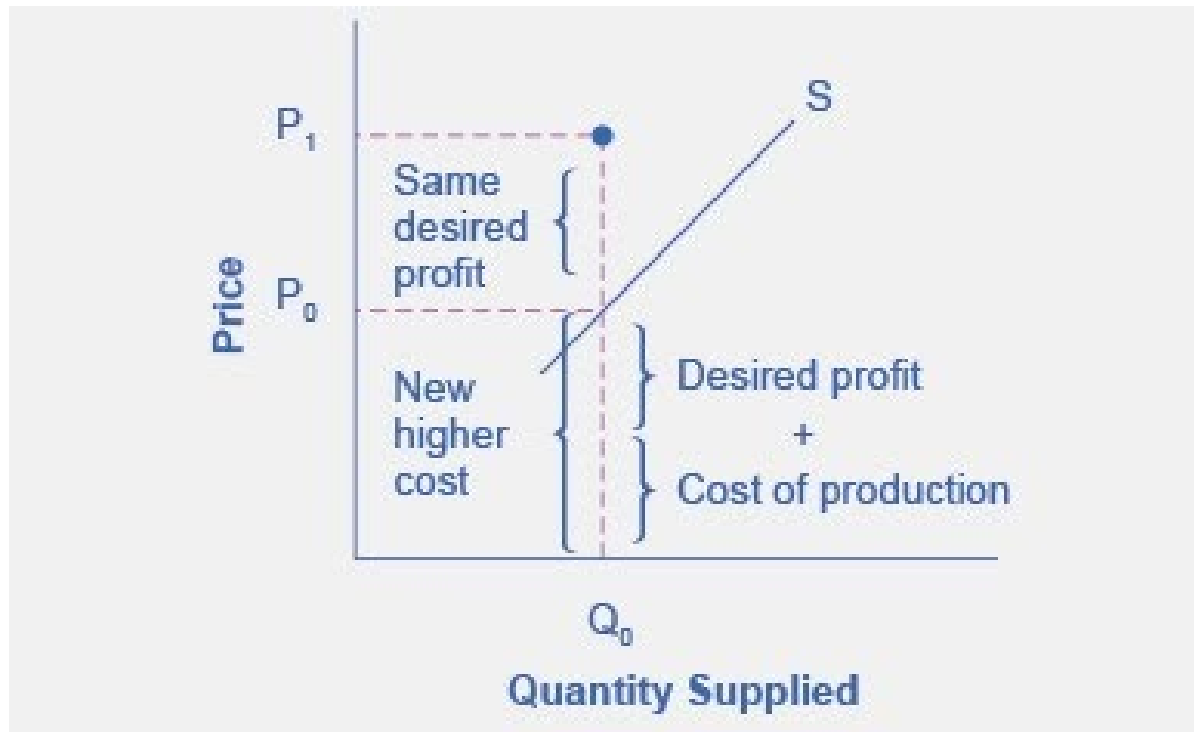
- The supply curve can be used to show the minimum price a firm will accept to produce a given quantity of output.

Supply Price



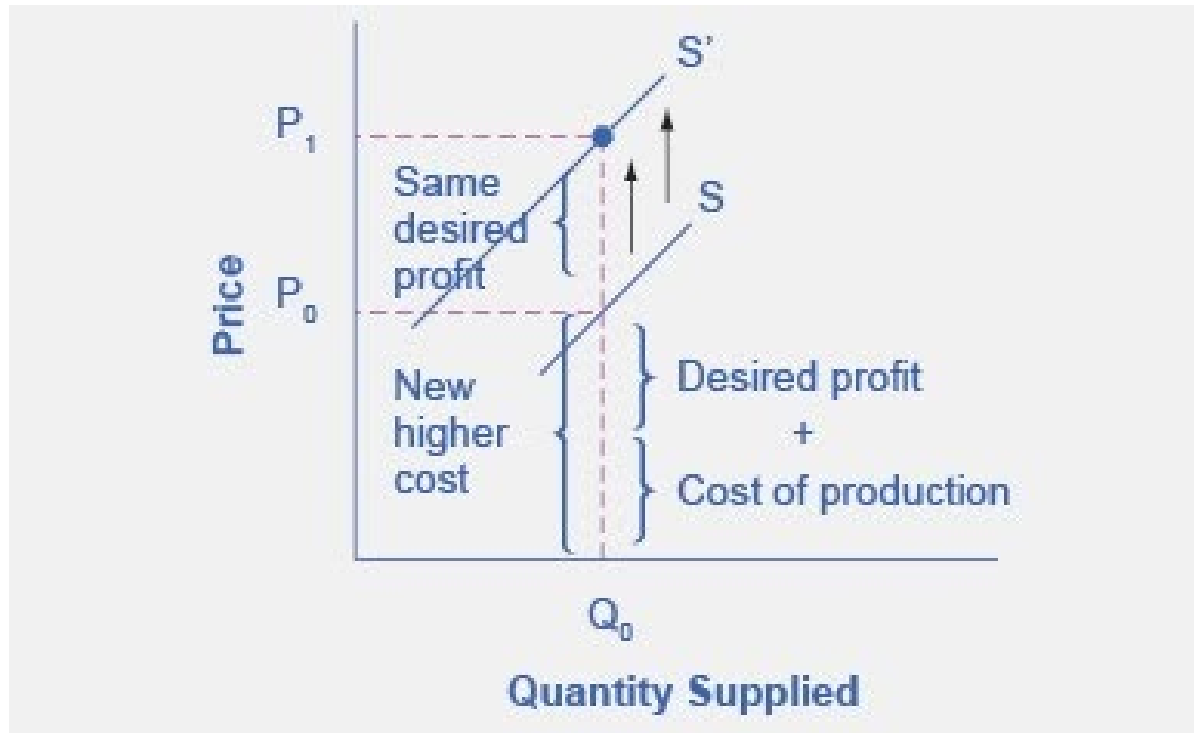
- The cost of production and the desired profit equal the price a firm will set for a product.

Changing the Price



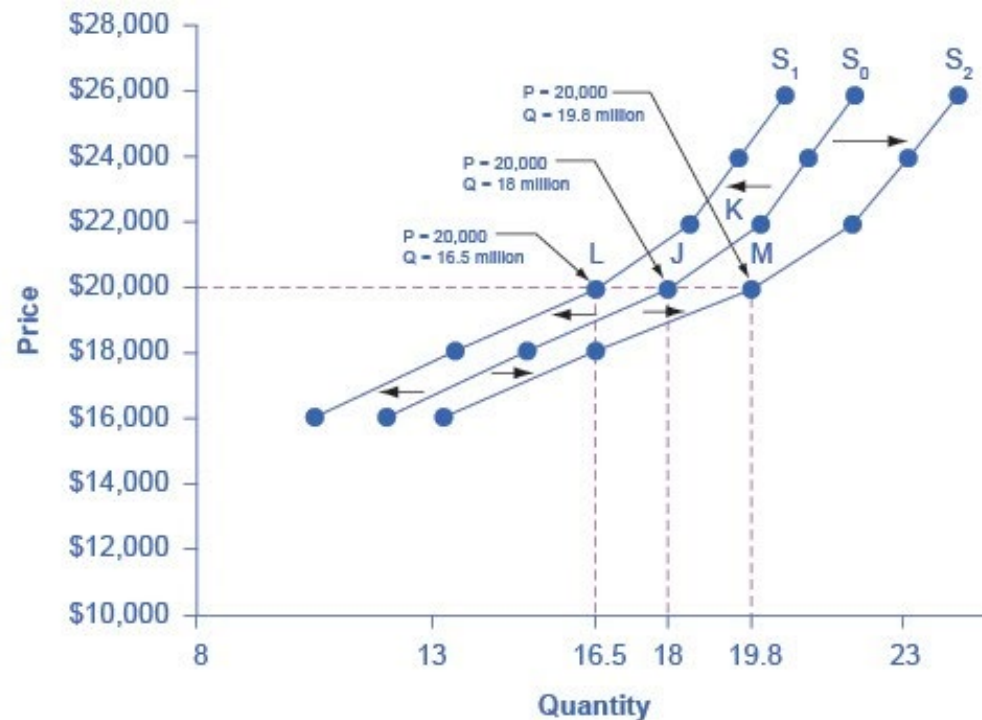
- Because the cost of production and the desired profit equal the price a firm will set for a product,
 - If the cost of production \uparrow , the price for the product will also need to \uparrow .

Shifting the Supply Curve



- If the cost of production increases, the supply curve shifts *up* to a new price level.
 - This is equivalent to a shift *left* of the supply curve

Shifting the Supply Curve

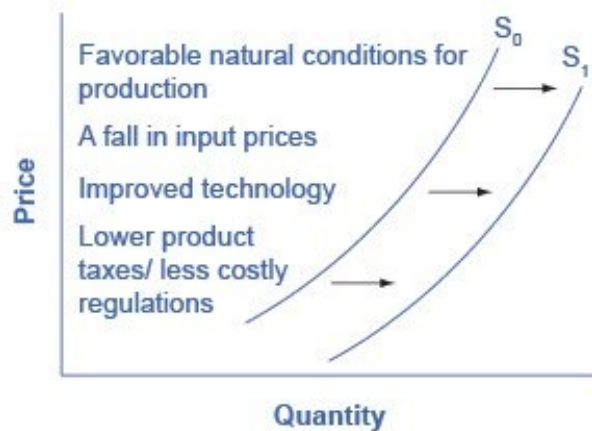


- Decreased supply: at each price, the quantity supplied is lower
 - the supply curve shifts to the *left*, from S_0 to S_1 .
- Increased supply: at each price, the quantity supplied is higher,
 - the supply curve shifts to the *right*, from S_0 to S_2 .

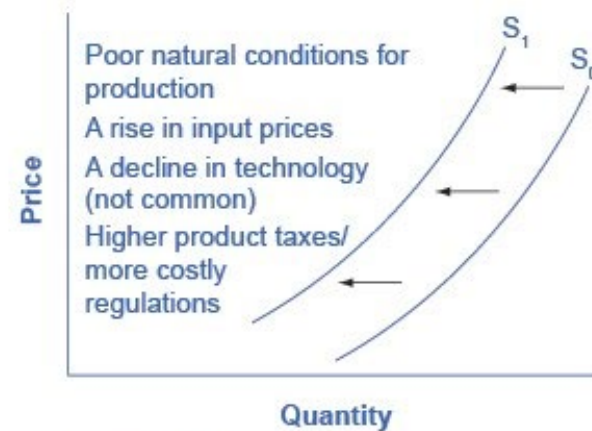
What Factors Affect Supply?

- **Shift in supply** - when a change in some economic factor (other than price) causes a different quantity to be supplied at every price.
- **Inputs or factors of production** - the combination of labor, materials, and machinery that is used to produce goods and services.
- Factors that affect supply:
 - Natural conditions
 - Input prices
 - Technology
 - Government policies

How Factors Affect Supply



(a) Factors that increase supply



(b) Factors that decrease supply

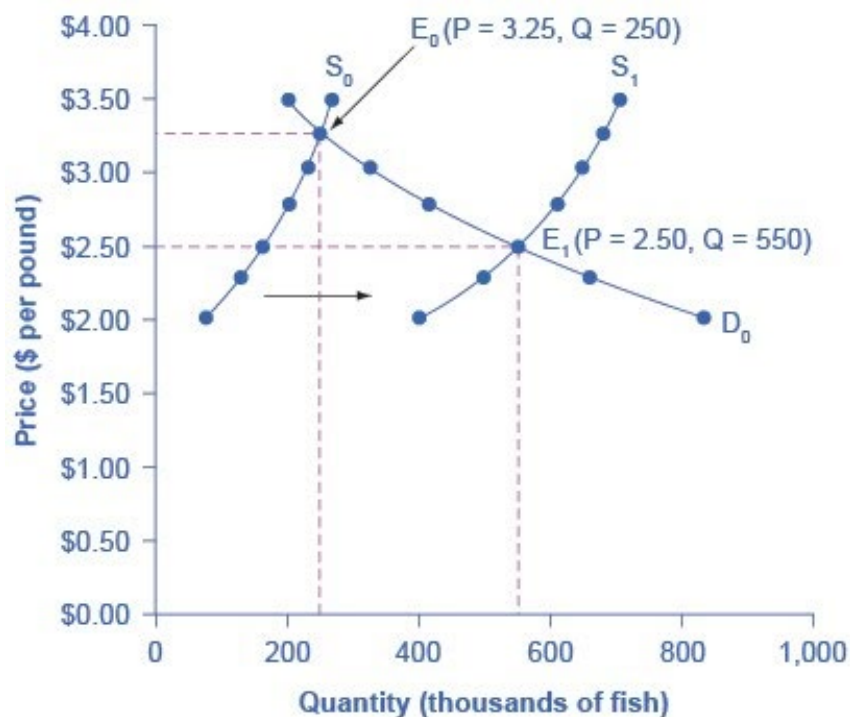
- (a) A list of factors that can cause an increase in supply from S_0 to S_1 .
- (b) The same factors, if their direction is reversed, can cause a decrease in supply from S_0 to S_1 .

3.3 Changes in Equilibrium Price and Quantity: The Four-Step Process

Four-step process to determining how an economic event affects *equilibrium price* and *quantity*:

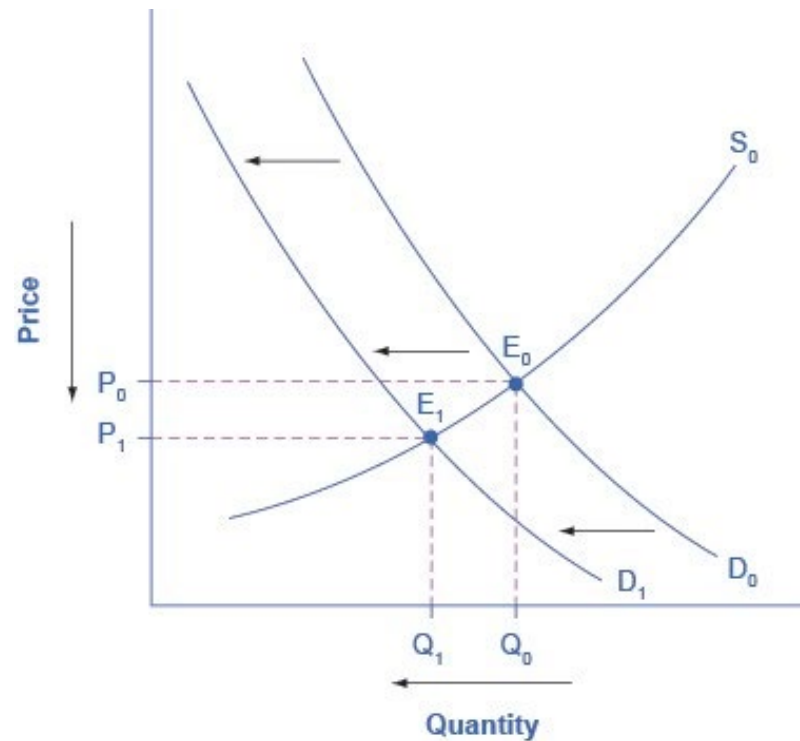
- Step 1. Draw a demand and supply model before the economic change took place.
- Step 2. Decide whether the economic change affects demand or supply.
- Step 3. Decide whether the effect causes a curve shift to the right or to the left, and sketch the new curve on the diagram.
- Step 4. Identify the new equilibrium and then compare to the original.

Example: Shift in Supply



- Discussion Question:** Using the 4-step approach, how did excellent weather conditions during the summer affect the quantity and price of salmon?

Example: Shift in Demand

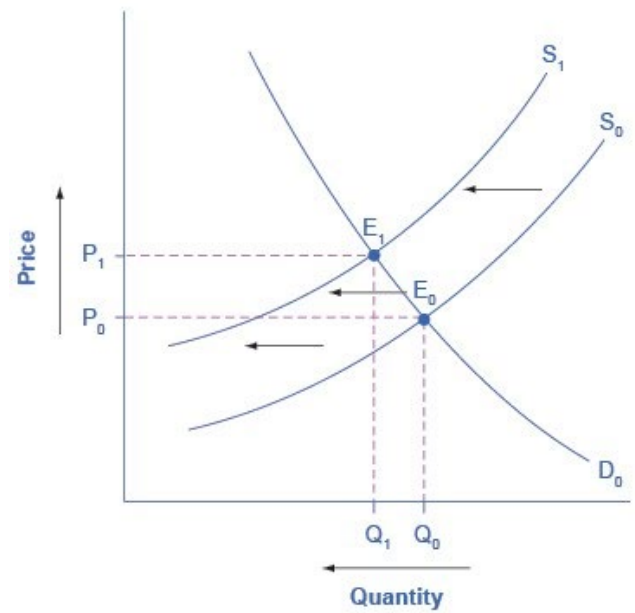


- **Discussion Question:** From 2004 to 2012, the share of Americans who reported obtaining their news from digital sources increased from 24% to 39%. Using the 4-step approach, how has this affected the consumption of traditional sources, such as print news media, and radio and television news?

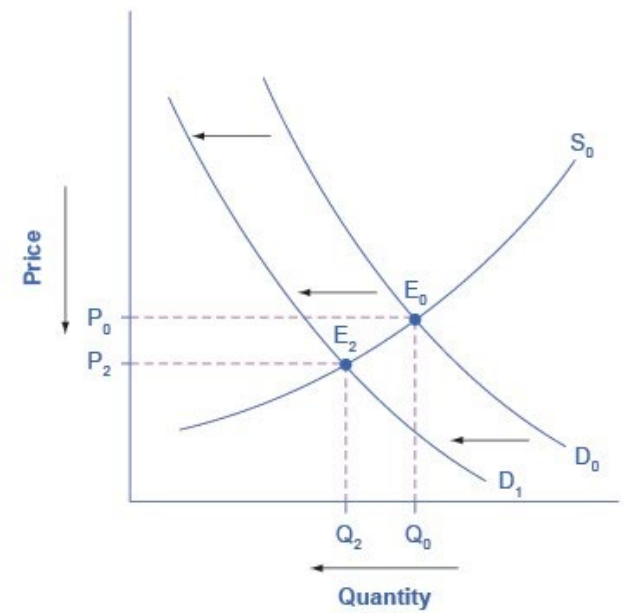


A Combined Example

- **Discussion Question:** Using the 4-step approach, what does an increase in labor compensation, as well as an increase in digital communication suggest about the continued viability of the Postal Service?



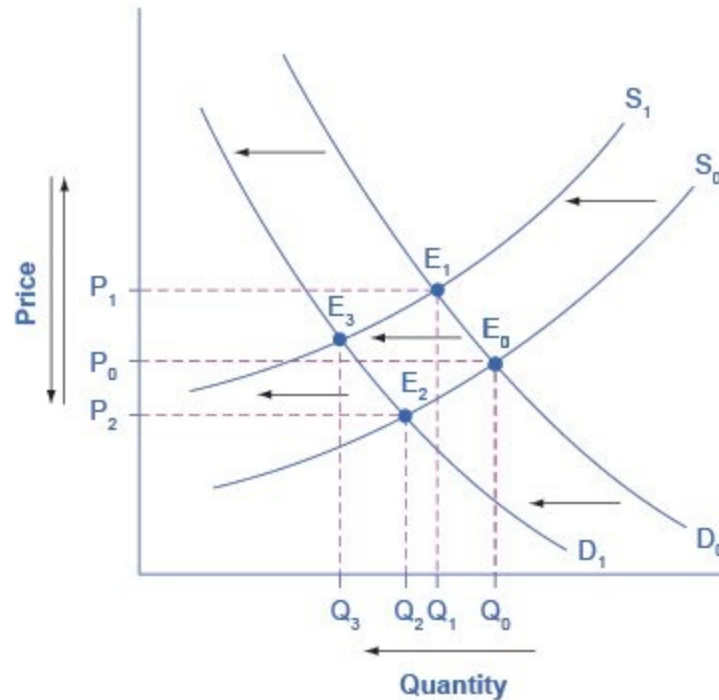
(a) Shift in supply



(b) Shift in demand

- (a) Higher labor compensation causes a leftward shift in the supply curve, a decrease in the equilibrium quantity, and an increase in the equilibrium price.
- (b) A change in tastes away from Postal Services causes a leftward shift in the demand curve, a decrease in the equilibrium quantity, and a decrease in the equilibrium price.

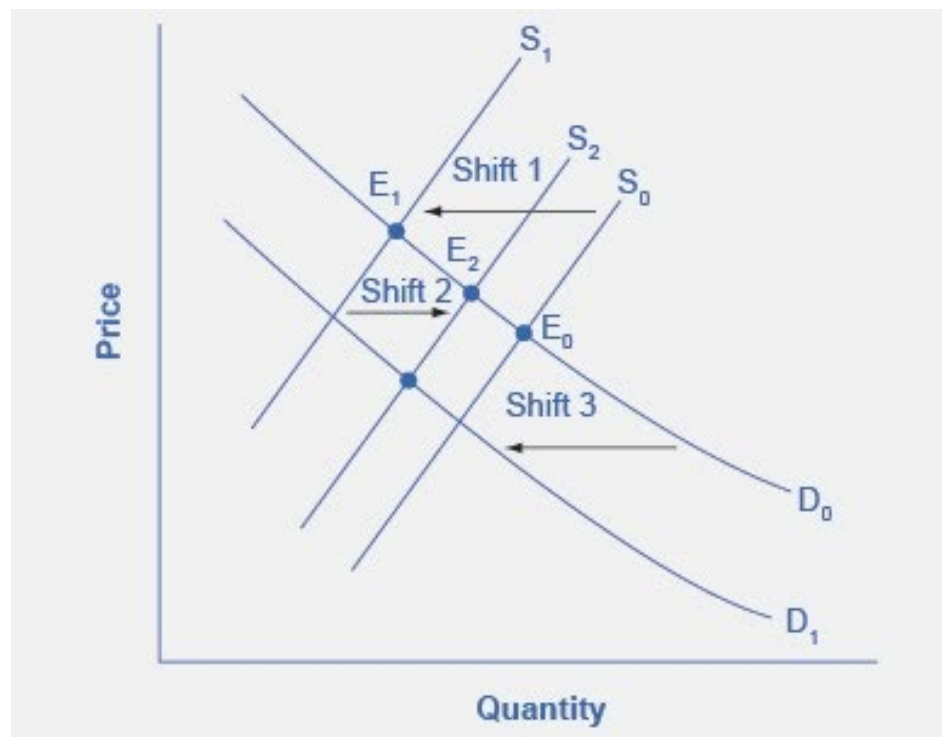
A Combined Example



- Superimposing the previous two diagrams one on top of the other, we see that supply and demand shifts cause changes in equilibrium price and quantity.

Movements vs. Shifts

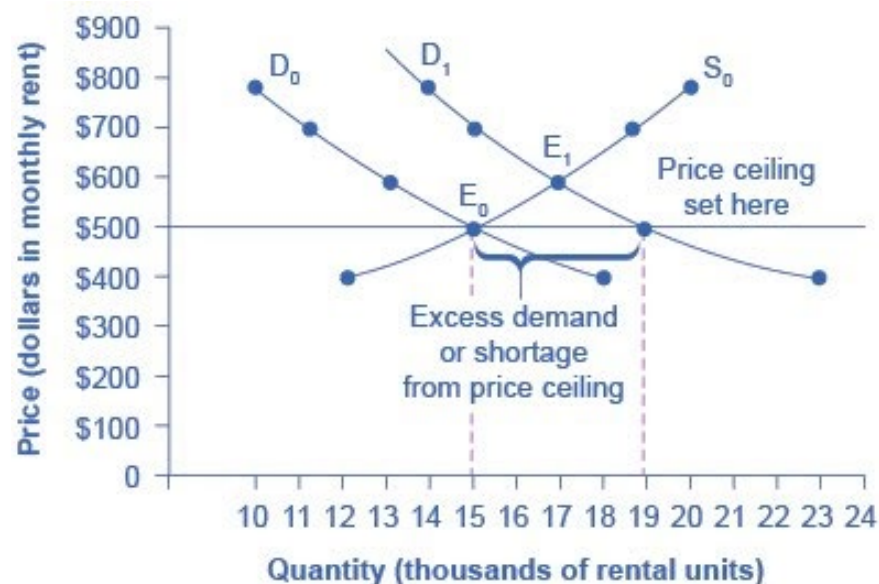
- A “movement along” is different than a “shift of”.
- A shift of one curve never causes a shift of the other curve.
- A **shift of** one curve causes a **movement along** the other curve.



3.4 Price Ceilings and Price Floors

- **Price controls** - laws that governments enact to regulate prices.
 - **Price ceiling** -
 - keeps a price from rising above a certain level
 - a legal maximum price that one pays for some good or service
 - **Price floor** -
 - keeps a price from falling below a given level.
 - is the lowest price that one can legally pay for some good or service.

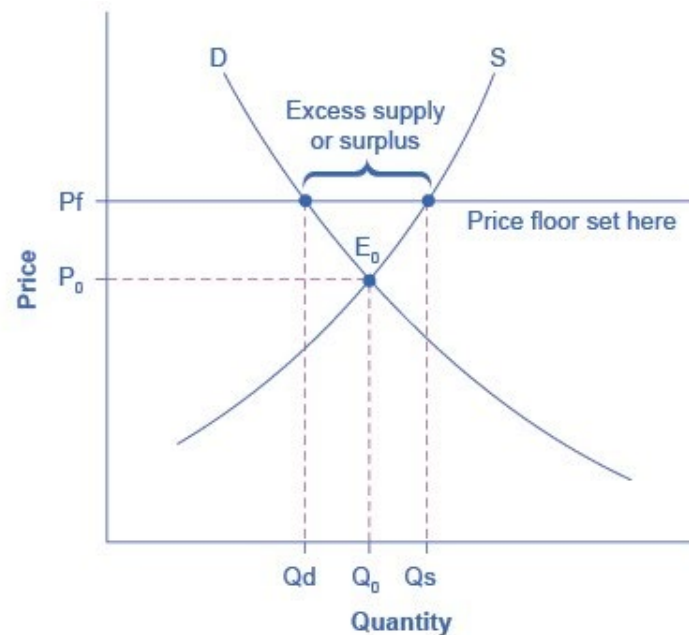
A Price Ceiling Example - Rent Control



- The original intersection of demand and supply occurs at E_0 .
- If demand shifts from D_0 to D_1 , the new equilibrium would be at E_1 - unless a price ceiling prevents the price from rising.
- If the price is not permitted to rise, the quantity supplied remains at 15,000. However, after the change in demand, the quantity demanded rises to 19,000, resulting in a shortage.



A Price Floor Example - European Wheat P_{openstax}TM



- The intersection of demand (D) and supply (S) would be at the equilibrium point E_0 .
- However, a price floor set at P_f holds the price above E_0 and prevents it from falling.
- The result of the price floor is that the quantity supplied Q_s exceeds the quantity demanded Q_d . There is excess supply, also called a surplus.

3.5 Demand, Supply, and Efficiency

- **Consumer surplus** -

- the amount that individuals would have been willing to pay minus the amount that they actually paid.
- the area above the market price and below the demand curve.

- **Producer surplus** -

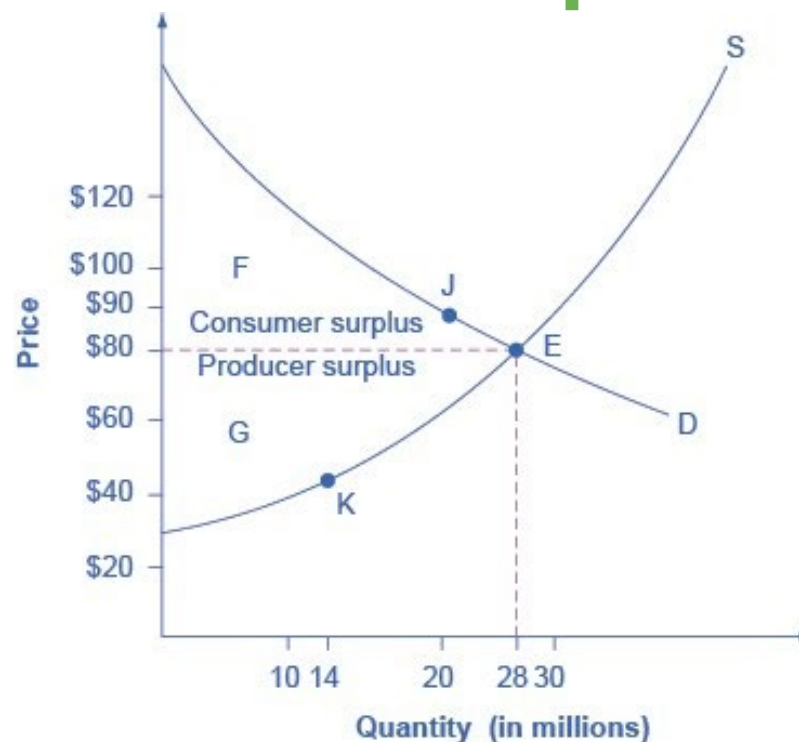
- the price the producer actually received minus the price the producer would have been willing to accept.
- the area between the market price and the segment of the supply curve below the equilibrium.

- **Social surplus/economic surplus/total surplus** =

consumer surplus + producer surplus

- **Deadweight loss** - the loss in social surplus that occurs when a market produces an inefficient quantity

Consumer and Producer Surplus

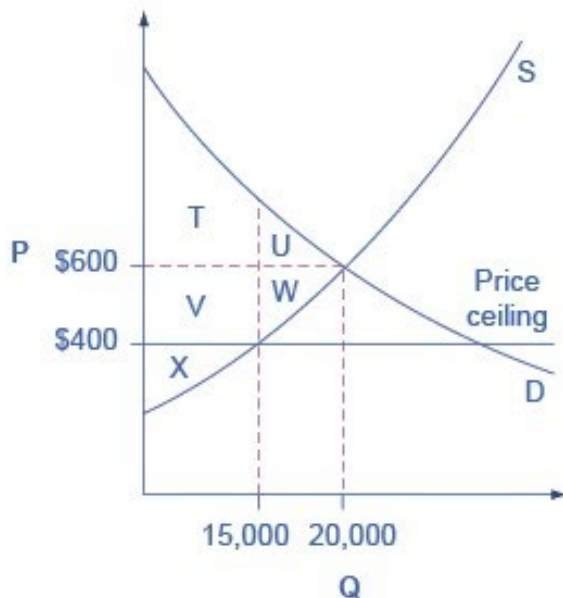


- The somewhat triangular area labeled by F shows the area of consumer surplus, which shows that the equilibrium price in the market was less than what many of the consumers were willing to pay.
- The somewhat triangular area labeled by G shows the area of producer surplus, which shows that the equilibrium price received in the market was greater than what many of the producers were willing to accept for their products.

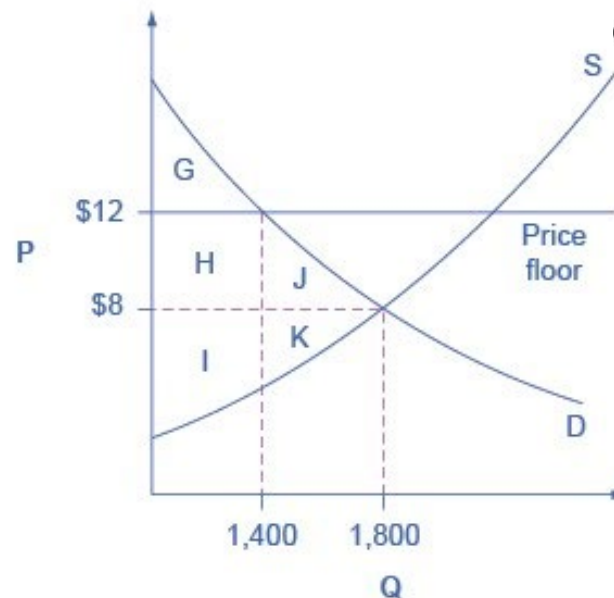
Efficiency and Price Floors and Ceilings



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(a) Reduced social surplus from a price ceiling



(b) Reduced social surplus from a price floor

- (a) The original equilibrium price is \$600 with a quantity of 20,000. Consumer surplus is $T + U$, and producer surplus is $V + W + X$. A price ceiling is imposed at \$400, so firms in the market now produce only a quantity of 15,000. As a result, the new consumer surplus is $T + V$, while the new producer surplus is X .
- (b) The original equilibrium is \$8 at a quantity of 1,800. Consumer surplus is $G + H + J$, and producer surplus is $I + K$. A price floor is imposed at \$12, which means that quantity demanded falls to 1,400. As a result, the new consumer surplus is G , and the new producer surplus is $H + I$.

END