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WHAT IS A MARKET?

The collection of buyers and sellers that, through their actual or potential interactions, determine the price of the product or set of products.

Market definition matters...



Determination of the buyers, sellers, and range of products that should be included in a particular market.

Types of markets

1. Perfectly competitive
2. Monopoly
3. Monopolistic competition
4. Oligopoly

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PERFECTLY COMPETITIVE MARKETS

Market with many buyers and sellers, so that no single buyer or seller has a significant impact on price.

Supply and demand model applies if the market is

Roughly competitive

buyers and sellers have little market power
(little ability to individually affect the market price)

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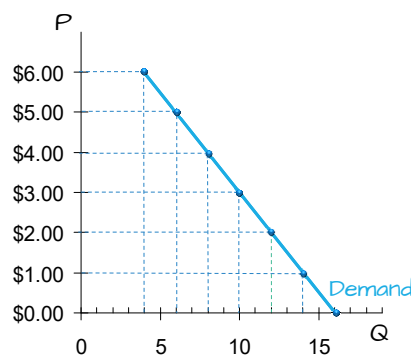
DEMAND CURVE

Shows the relationship between the quantity of a good that consumers are willing and able to buy and the price of the good.

Table

P	Q_D
\$0	16
1	14
2	12
3	10
4	8
5	6
6	4

Graph



Function

Linear

$$Q^d = 16 - 2P$$

Non-Linear

$$Q^d = 2P^{-3}$$

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CHANGES IN DEMAND...

The demand curve shows how price affects quantity demanded, **other things being equal**.

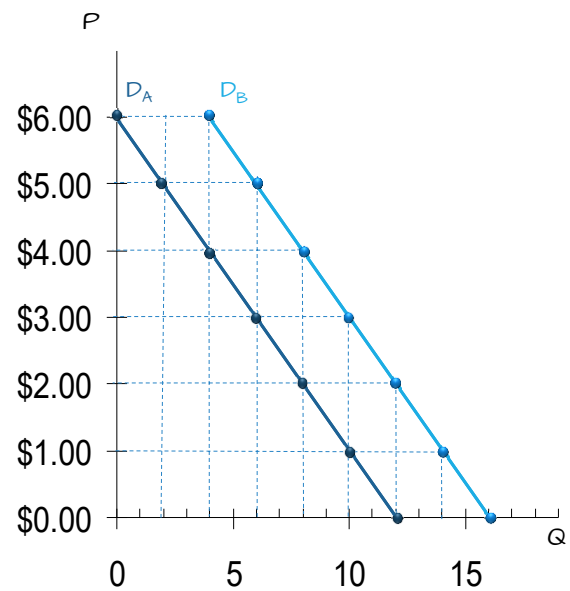
If something other than price or quantity demanded changes, we represent it with a shift in the demand curve.

Increase in demand is represented by a rightward shift (D_A to D_B)

- A higher quantity demanded at every price

Decrease in demand is represented by a leftward shift (D_B to D_A)

- A lower quantity demanded at every price.

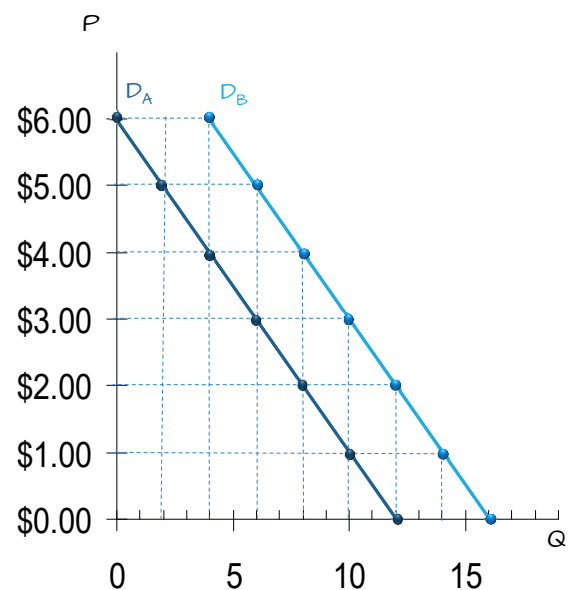


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CHANGES IN DEMAND...

Can be caused by

1. A change in consumer income
2. A change in the price of related goods
 - Substitutes
 - Complements
3. A change in market size
4. Expectations about future prices



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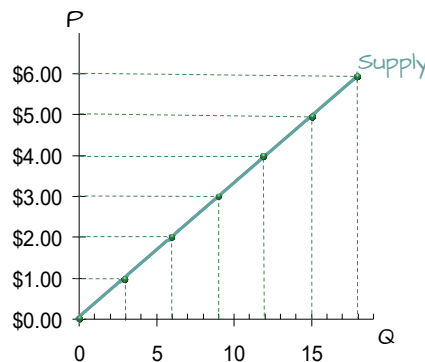
SUPPLY CURVE

Shows the relationship between the quantity of a good that producers are willing and able to sell and the price of the good.

Table

P	Q_s
\$0	0
1	3
2	6
3	9
4	12
5	15
6	18

Graph



Function

Linear

$$Q^s = 3P$$

Non-Linear

$$Q^s = 3P^2$$

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CHANGES IN SUPPLY...

The supply curve shows how price affects quantity supplied, *other things being equal*.

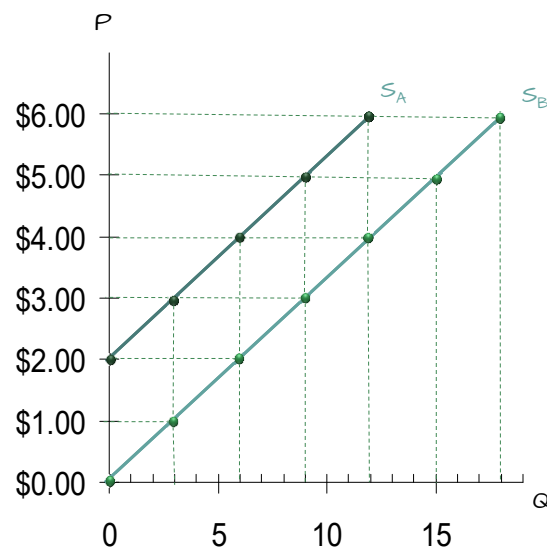
If something other than price or quantity demanded changes, we represent it with a shift in the supply curve.

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Decrease in supply is represented by a leftward shift (S_B to S_A)

- A lower quantity supplied at every price.

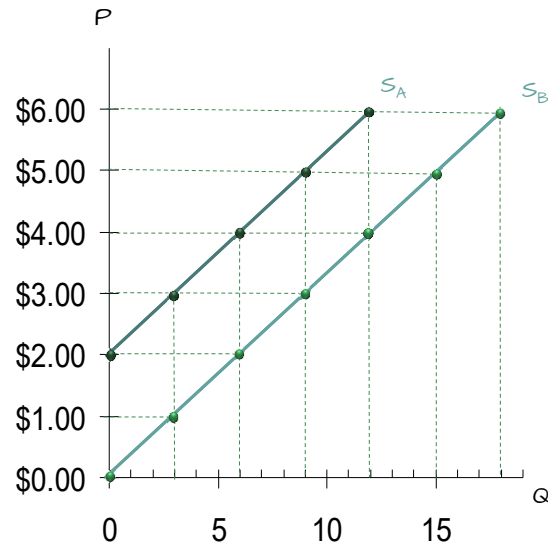


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CHANGES IN SUPPLY...

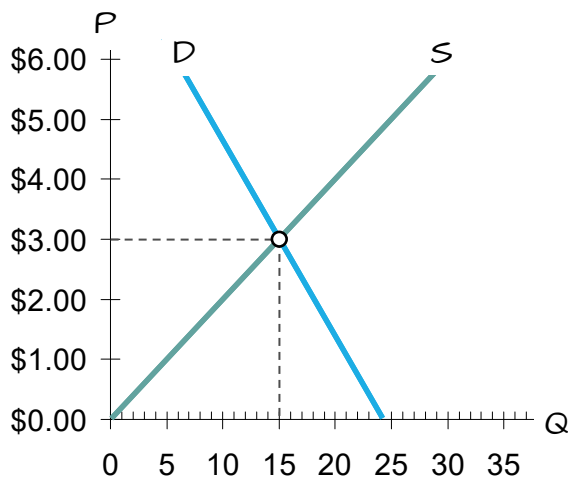
Can be caused by

1. A change in production costs
2. Natural events
3. A change in market size
4. Expectations about future prices



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SUPPLY AND DEMAND TOGETHER



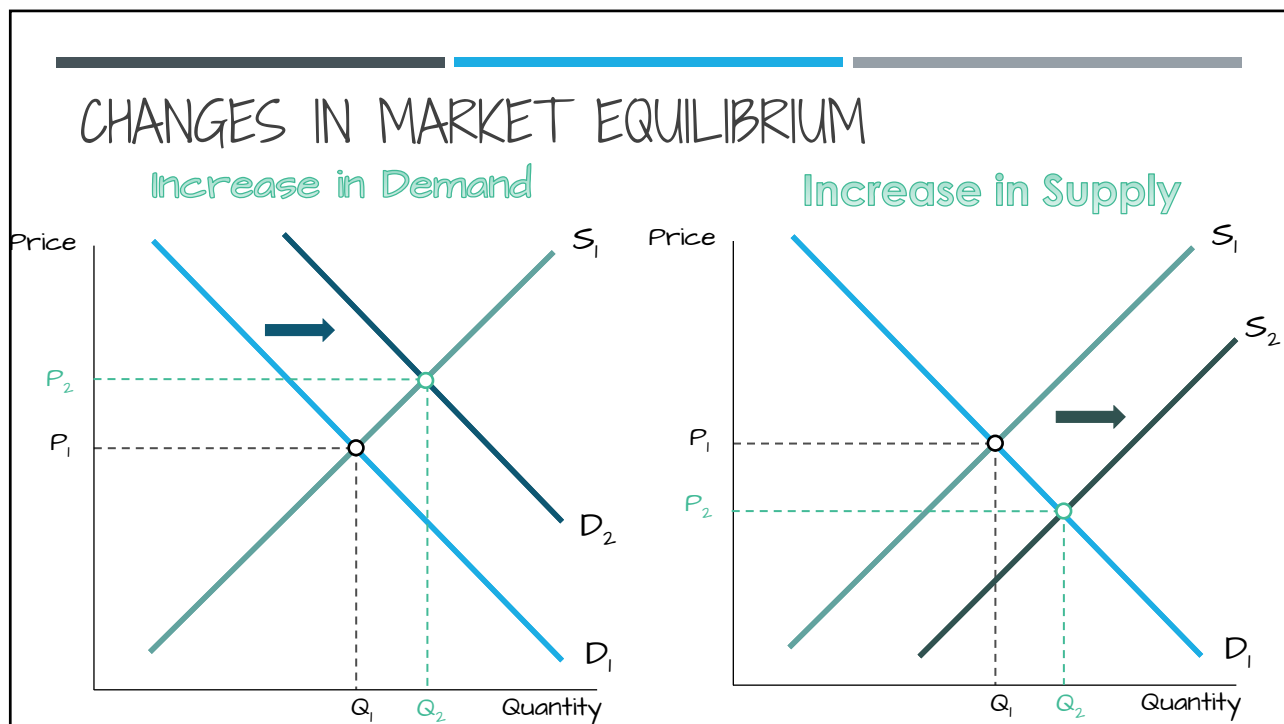
Equilibrium consists of:

1. Market clearing price
 - Price that equates the quantity supplied to the quantity demanded.
2. Market clearing quantity

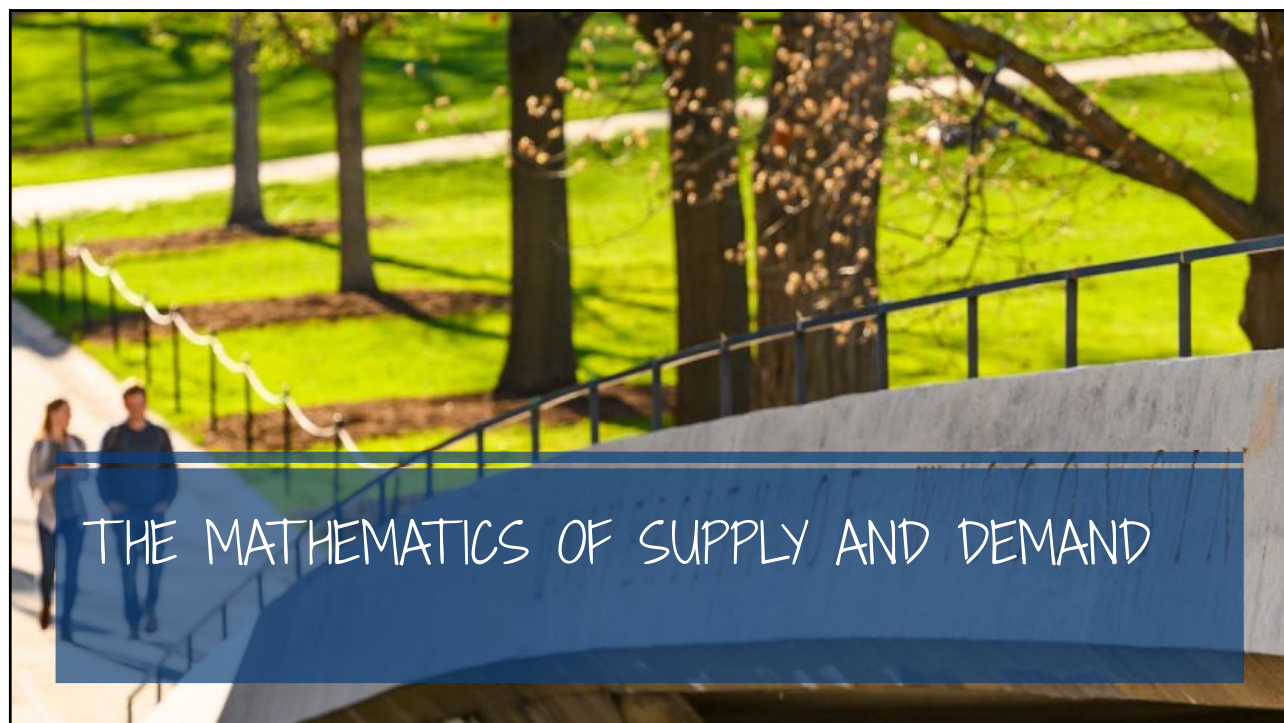
Market mechanism

Tendency in the free market for price to change until the market **clears**

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ALGEBRA REMINDERS...

Line

$$y = b + mx$$

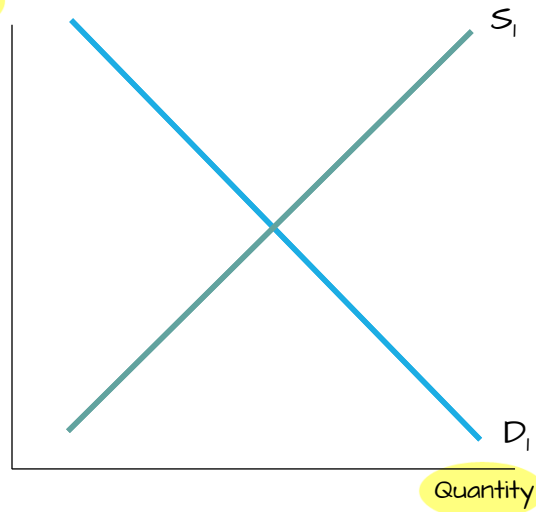
↙ y intercept ↘ slope

Demand and Supply

$$P = b + mQ$$

+ for supply - for demand

Price



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ALGEBRA REMINDERS...

Demand and Supply curves are typically written:

$$Q^d = f(P, I, P_c, P_s) \text{ and } Q^s = g(P, t, c, n)$$

Equilibrium occurs when these two curves intersect

$$Q^d = Q^s$$

If you see something written in this form

$$P = b + mQ$$

It is called an **inverse demand** or **inverse supply** curve.

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A SUPPLY AND DEMAND EXAMPLE

Consider the market for golf balls

$$Q^d = 90 - 2P - 2T$$

$$Q^s = -9 + 5P - 2.5R$$

- T is the price of titanium, a metal used to make golf clubs
- R is the price of rubber

Suppose that $R = 2$ and $T = 10$.

1. Update the demand and supply curves to reflect these values.

$$Q^d = 90 - 2P - 2(10)$$

$$Q^d = 70 - 2P$$

$$Q^s = -9 + 5P - 2.5(2)$$

$$Q^s = 5P - 14$$

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A SUPPLY AND DEMAND EXAMPLE

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- R is the price of rubber

When $R = 2$ and $T = 10$

$$Q^d = 70 - 2P$$

$$Q^s = 5P - 14$$

2. Solve for the equilibrium price and quantity.

$$Q^s = Q^d$$

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A SUPPLY AND DEMAND EXAMPLE

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When $R = 2$ and $T = 10$

$$Q^d = 70 - 2P$$

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Suppose the price of a golf ball is currently \$10.

- Determine the size of the resulting shortage (excess demand) of golf balls.

$$Q^d =$$

$$Q^s =$$

$$\text{Shortage} = Q^d - Q^s =$$

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A SUPPLY AND DEMAND EXAMPLE

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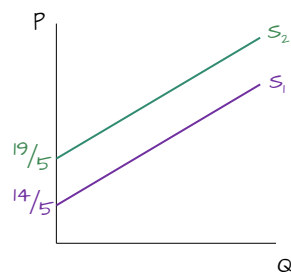
Suppose that R increases from 2 to 4

- How would you describe the resulting change in the supply of golf balls? Explain.

$$Q_{new}^s = -9 + 5P - 2.5(4)$$

$$Q_{new}^s = 5P - 19$$

Decrease in supply!



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PRICE ELASTICITY OF DEMAND (E_p)

Percentage change in quantity demanded of a good resulting from a 1% increase in its price.

Measure of how sensitive buyers in a market are to changes in price.

$$E_p = \frac{\% \Delta Q}{\% \Delta P}$$

Can take on many values...

perfectly elastic

if $E_p = -\infty$

elastic

if $-\infty < E_p < -1$

unit elastic

if $E_p = -1$

inelastic

if $-1 < E_p < 0$

perfectly inelastic

if $E_p = 0$

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POINT ELASTICITY OF DEMAND

Price elasticity calculated at a particular point on the demand curve.

If the Demand Function is specified by $Q^d(P)$, then:

$$E_p = \frac{P}{Q} \times \frac{dQ^d}{dP}$$

A quick example...

$$Q^d = 70 - 2P$$

Suppose the equilibrium price = \$12. Find the price elasticity of demand at the equilibrium.

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LINEAR DEMAND CURVE

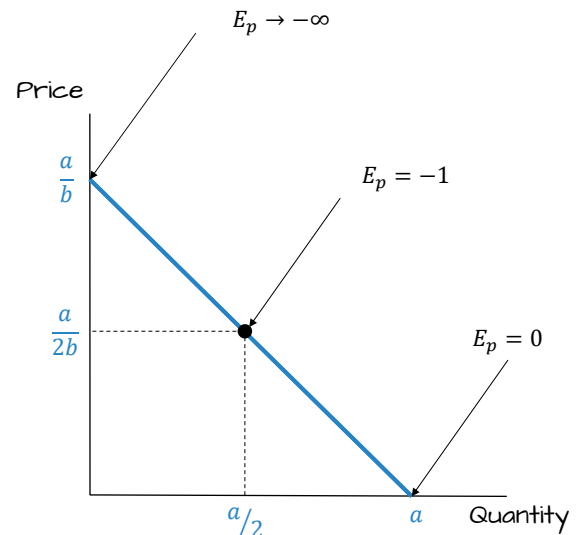
Demand curve in the form: $Q^d = a - bP$

Associated **inverse demand**: $P = \frac{a}{b} - \frac{Q}{b}$

Elasticity is $-b \left(\frac{P}{Q} \right)$

As we move down the demand curve $\frac{P}{Q}$ changes...

Elasticity is not constant along a linear demand curve.



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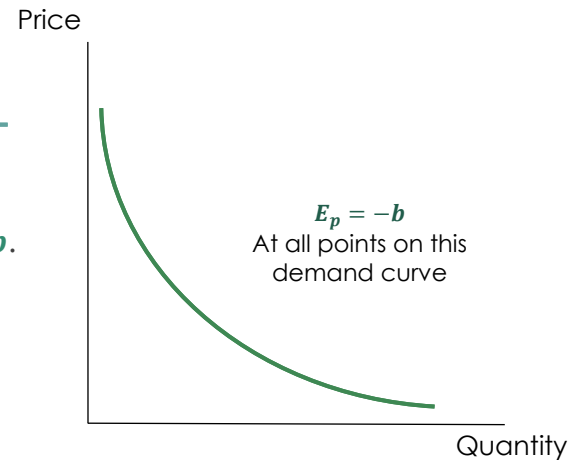
CONSTANT ELASTICITY DEMAND CURVE

Demand curve in the form: $Q^d = aP^{-b}$

(a and b are positive constants)

Nice property...

Price elasticity, E_p , is always equal to $-b$.



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DETERMINANTS OF PRICE ELASTICITY OF DEMAND

Demand tends to be more price elastic

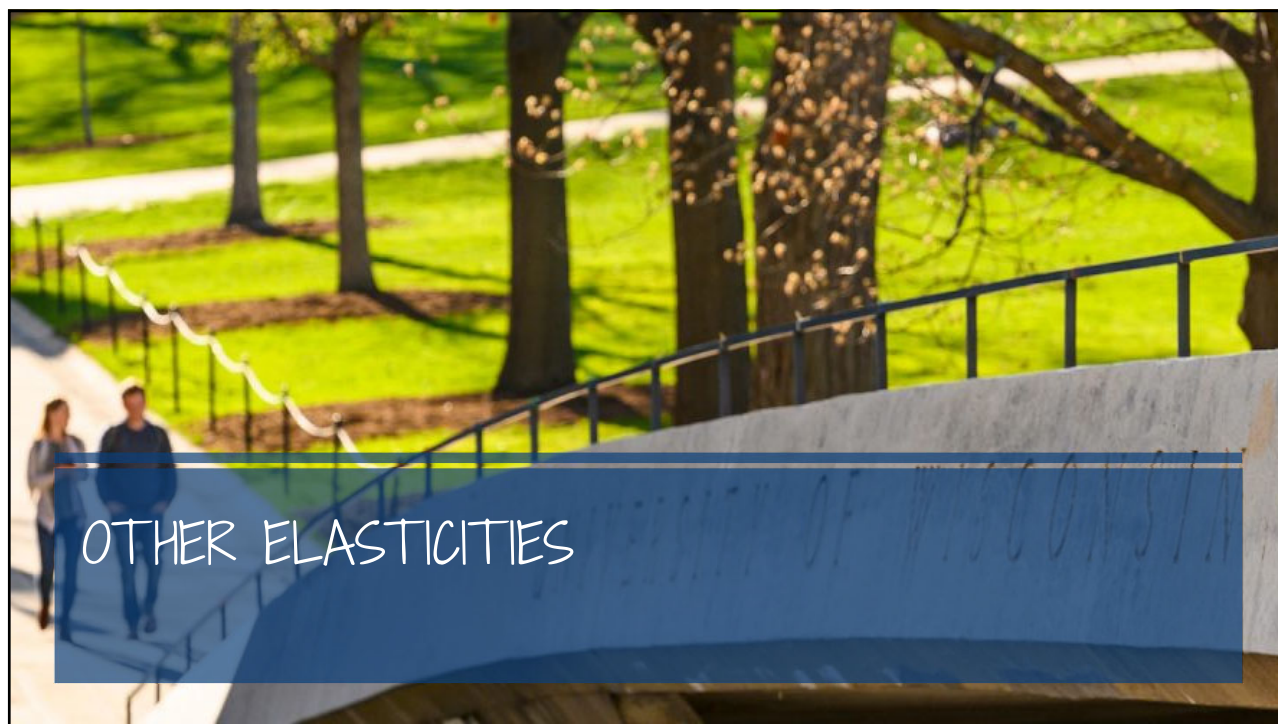
- If there are good substitutes available (or when the market is defined narrowly).
- If a consumer's expenditure on a product is large.

Demand tends to be less price elastic

- If the product is viewed by consumers as a necessity.

Product	Elasticity of Demand
Eggs	-0.06
Beef	-0.35
Breakfast Cereal	-0.031
Froot Loops	-2.34
Cheerios	-3.66
Jeep Grand Cherokee	-3.06
Toyota Corolla	-3.92

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CROSS-PRICE ELASTICITY OF DEMAND

Percentage change in the quantity demanded of one good resulting from a 1% increase in the price of another.

If the Demand Function is specified by $Q_a^d(P_a, P_b)$, then:

$$E_{Q_a, P_b} = \frac{P_b}{Q_a} \times \frac{\partial Q_a^d}{\partial P_b}$$

Sign Matters...

If $E_{Q_a, P_b} > 0 \rightarrow a$ and b are **substitutes**

If $E_{Q_a, P_b} < 0 \rightarrow a$ and b are **complements**

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CROSS-PRICE ELASTICITY OF DEMAND

Percentage change in the quantity demanded of one good resulting from a 1% increase in the price of another.

A quick example...

$$Q_g^d = 90 - 2P - 2T$$

P = price of golf balls

T = price of titanium

Find the cross-price elasticity of demand for **golf balls** with respect to the **price of titanium** when $P = 12$ and $T = 10$

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INCOME ELASTICITY OF DEMAND

Percentage change in the quantity demanded resulting from a 1% increase in Income

If the Demand Function is specified by $Q^d(P, I)$, then:

$$E_I = \frac{I}{Q} \times \frac{\partial Q^d}{\partial I}$$

Sign Matters...

If $E_I > 0 \rightarrow$ **Normal Good**

If $E_I < 0 \rightarrow$ **Inferior Good**

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PRICE ELASTICITY OF SUPPLY

Percentage change in quantity supplied of a good resulting from a 1% increase in its price.

If the Supply Function is specified by $Q^s(P)$, then:

$$E_p^S = \frac{P}{Q} \times \frac{dQ^s}{dP}$$

Primary determinant of price elasticity of supply...

Suppliers' ability to adjust production

Other Elasticities of Supply

Elasticity of Supply with respect to:

1. Interest rates
2. Wage rates
3. Price of raw materials