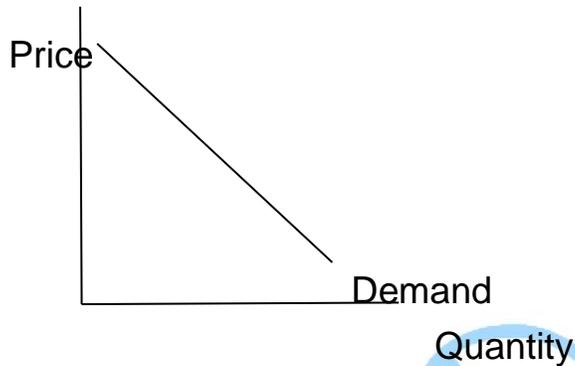


# AP Microeconomics

## Unit 2: Supply and Demand

### 2.1 Demand

- Demand is downwards sloping:

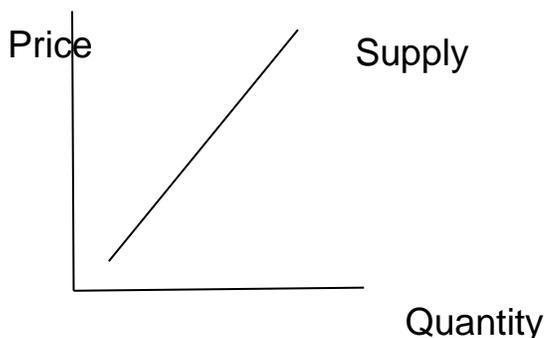


- **IMPORTANT:** When demand increases or decreases, it does not shift up or down; rather, it moves to the left if it decreases and to the right if it increases. Always use arrows to point towards the direction of the shift.
- Price and quantity demanded are inversely related
  - **Substitution effect:** when the price of a good decreases, consumers substitute this good for goods that are relatively more expensive than this cheaper good. When the price of a good increases, people will substitute less expensive goods.
  - **Law of Diminishing Marginal Utility:** states that all else equal, as consumption increases the marginal utility for each additional unit decreases.
  - **Income effect:** how much one's income is actually worth depends on the price of goods). When the price of a good falls, consumers experience an increase in purchasing power.
    - **Normal goods:** buy more when receive higher income
      - (ex. computers)
    - **Inferior goods:** buy less when receive higher income
      - (ex. cup noodles)
- **Law of Demand:** a decrease in the price of goods causes an increase in the quantity demanded OR an increase in price causes a decrease in the quantity demanded

- Changes in Demand can be a result of:
  - Change in income - when the good is a normal good, demand increases when income increases. If the good is inferior, as income increases, demand decreases
  - Change in the price of substitute goods - if the price of good X decreases, the demand for good Y decreases OR if the price of good X increases, the demand for good Y increases, then good X and good Y are called substitutes.
  - Change in the price of complementary goods (goods that are used together) - if the price of good X decreases as the demand for good Y increases, then they are complements.
  - Change in the number of buyers - if the number of buyers increases, demand for goods increase
  - Change in Expectations - if people expect the price of goods to increase, demand will increase now.
  - Change in Styles/Tastes - as style changes over time, so does demand for goods/services
- Buyers determine demand
- Demand Curves Slope Downward
  - **Diminishing Marginal Utility**: as a consumer purchases more of a good/service, the additional satisfaction falls for each additional unit.
    - **Marginal Utility**: The extra satisfaction received from consuming an additional unit of a good or service.

## 2.2 Supply

- Supply is upwards sloping:
  - Price and quantity supplied are directly related



- When supply increases or decreases, it does not shift up or down; rather, it moves to the left if it decreases and to the right if it increases. Always use arrows to point towards the direction of the shift.
- Market supply curve is upward sloping because when the price that a good is being sold at is higher, producers want to produce more → creates more supply
  - Inverse is true: if price that something's being sold at is low, producers want to produce less of it
- **Profit Motive:** when market prices rise following an increase in demand, it becomes more profitable for businesses to increase output
- **Production & Costs:** when output expands, a firm's production costs begin to rise requiring a higher price to cover these extra costs of production
- **New Entrants:** higher prices may create an incentive for new business to enter the market leading to an increase in supply.
- **Law of Supply:** as prices increase, the quantity supplied increases. Price does not affect supply, it affects the quantity supplied.
- Changes in Supply can be a result of:
  - Changes in the cost of production - if the cost of producing goods increases, supply will decrease. If it gets cheaper to produce goods, supply will increase.
  - Changes in technology - if technology makes it cheaper to produce goods/service, supply will increase. It relates to productivity: if workers get more productive, the supply of goods will increase.
  - Change in the number of producers - an increase in the number of producers would increase the supply of goods/service.
  - Change in expectations - if producers expect the price to increase in the future, they will supply less now.

## 2.3 Price Elasticity of Demand

- **Price Elasticity of Demand:** - the measure of how responsive the quantity demanded is to changes in price.

- **ED > 1** = Relatively Price Elastic
- **ED < 1** = Relatively Price Inelastic
- **ED = 1** = Price Unit Elastic
- **ED = 0** = Perfectly Price Inelastic
- **ED = ∞** = Perfectly Price Elastic

$$e_d = \frac{\% \Delta Q_d}{\% \Delta P}$$

- **Inelastic Demand** - quantity demanded doesn't respond strongly to changes in price
- **Elastic Demand** - quantity demanded responds strongly to changes in price
  - explaining that the **percentage** change in quantity supplied exceeds the **percentage** change in price
  - demand is more elastic if there are more substitute goods. A monopolist has no close substitutes so it is likely the least elastic demand.
- **Unit Elastic** - quantity demanded changes by the same % as the price changes
- **Perfectly Price Elastic** - quantity demanded changes infinitely with any change in price
- **Perfectly Price Inelastic** - quantity demanded doesn't change with price changes
- Determinants
  - Availability of Close Substitutes - if there are many substitutes, demand is elastic
  - Necessities vs Luxuries - if the good/service is considered a luxury, the demand will be more elastic
  - % of Budget - the larger the percentage of your total budget, the more elastic demand will be.
  - Time - the longer consumers have to adjust to a price change, the more elastic the demand will be
- Demand is more elastic at lower quantities (higher prices) and more inelastic at high quantities (lower prices)
- Midpoint Formula

The Midpoint Formula is used to find %Δ in  $Q_d$  → 
$$\frac{Q_{d2} - Q_{d1}}{(Q_{d2} + Q_{d1})/2}$$

The Midpoint Formula is used to find %Δ in Price. → 
$$\frac{P_2 - P_1}{(P_2 + P_1)/2}$$

Image source: <https://www.pinterest.com/pin/88594317643742125/>

- Total Revenue Test (Price X Quantity)
  - If P increases and Total Revenue increases, Demand is Inelastic
  - If P decreases and Total Revenue decreases, Demand is Inelastic
  - If P increases and Total Revenue decreases, Demand is Elastic
  - If P decreases and Total Revenue increases, Demand is Elastic

## 2.4 Price Elasticity of Supply

- Responsiveness of quantity supplied to price changes
- Determinants of price elasticity of supply:
  - Ease and Speed of Getting New Products into the Marketplace
  - Time - the longer producers have to adjust to prices changes the more elastic the supply is)
    - “market-period” → firms are unable to respond to price change → inelastic
    - short-run → firms can only increase production with existing factories → elastic
    - long-run → firms can expand or reduce factory capacity → highly elastic

- must be positive since higher prices = larger quantities supplied

$$e_s = \frac{\% \Delta Q_s}{\% \Delta P}$$

- **ES = 0** means you are perfectly inelastic
- **ES < 1** means you are relatively inelastic
- **ES = 1** means you are unit elastic
- **ES > 1** means you are relatively elastic
- **ES = ∞** means you are perfectly elastic

## 2.5 Other Elasticities

- Quantity of a good demanded or supplied is not just dependent on price, so other elasticities can be measured for other factors beyond price as well. A measure of how much the quantity demanded of one good responds to a change in the price of another good
- Cross-Price Elasticity of Demand Between Goods A and B:

$$= \frac{\% \text{ change in quantity of A demanded}}{\% \text{ change in price of B}}$$

- Measures how much the demand of a certain good can be affected by price of a related good (when the goods are complements or substitutes)
  - If the cross-price elasticity of demand is **positive**, the goods are **substitutes**
    - If it's a very large number, they are strong substitutes
      - If the number is only slightly above 0, they are weak substitutes
  - If the cross-price elasticity of demand is **negative**, the goods are **complements**
    - If it's a very negative number, they are strong complements
    - If the number is only slightly below 0, they are weak complements
- Income Elasticity of Demand

$$\text{Income elasticity of demand} = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

- Measures how changes in income affect demand for a good
- If the income elasticity of demand is positive, the good is a normal good (a good in which quantity demanded for that good increases with increased income)
- If the income elasticity of demand is negative, the good is an inferior good (a good in which the quantity demanded for that good decreases with increased income)

## 2.6 Market Equilibrium and Consumer and Producer Surplus

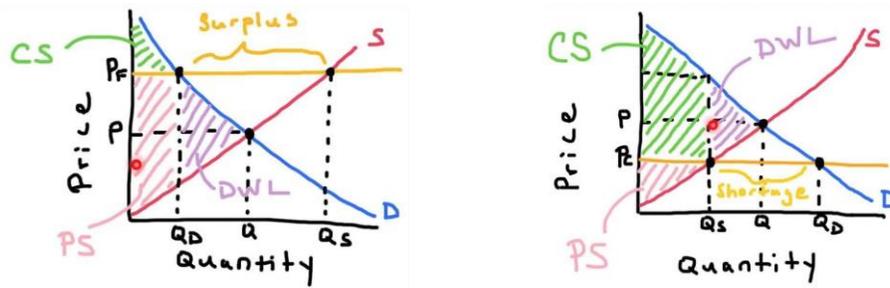
- **Equilibrium:** Where supply and demand intersect gives you the equilibrium price and quantity
- **Consumer Surplus:** the difference between the buyer's willingness to pay (height of the demand curve) and the price they do pay.

- **Producer Surplus:** the difference between the revenue earned for each unit (Q) and its marginal cost of production
- **Deadweight Loss (DWL):** Loss of efficiency when the optimal quantity (equilibrium) is not being produced.
  - Loss of total (consumer + producer) surplus.
  - Occurs anytime you move away from equilibrium due to government interference or externalities.
  - Found in the following graphs:
    - Monopoly (the result of setting price above MC)
    - Tax Graphs
    - Price Ceiling/Price Floor
    - Positive/Negative Externalities

## 2.7 Market Disequilibrium and Changes in Equilibrium

- **Shortage:** occurs when price is lower than equilibrium
- Quantity demanded > Quantity supplied
  - Usually due to a **Price Ceiling:** a legal maximum on the price at which a good can be sold (ex. rent control)
    - Must be set below equilibrium price for the price ceiling to be binding
    - Floor High, Ceiling Low (ON THE GRAPH)
  - A binding price ceiling will increase consumer surplus
  - If the supply is inelastic and a binding price ceiling is imposed, no DWL is resulted since the quantity supplied does not change after the imposition of the price ceiling.
  - What to do: Raise Price and Increase Quantity
- **Surplus:** occurs when price is higher than equilibrium
  - Quantity supplied > Quantity demanded
  - Usually due to a **Price Floor:** a legal minimum on the price at which a good can be sold (ex. minimum wage)
    - Must be set above equilibrium price for the price floor to be binding
    - Will create surplus - Quantity Demanded is < than Quantity Supplied
    - Floor High, Ceiling Low (ON THE GRAPH)

- What to do: Lower Price and (2) Reduce Quantity



Image

source: <https://t.me/apresources>

- Double Shift Rule

- If two curves shift at once, either price or quantity will be indeterminate, you will know the other one.

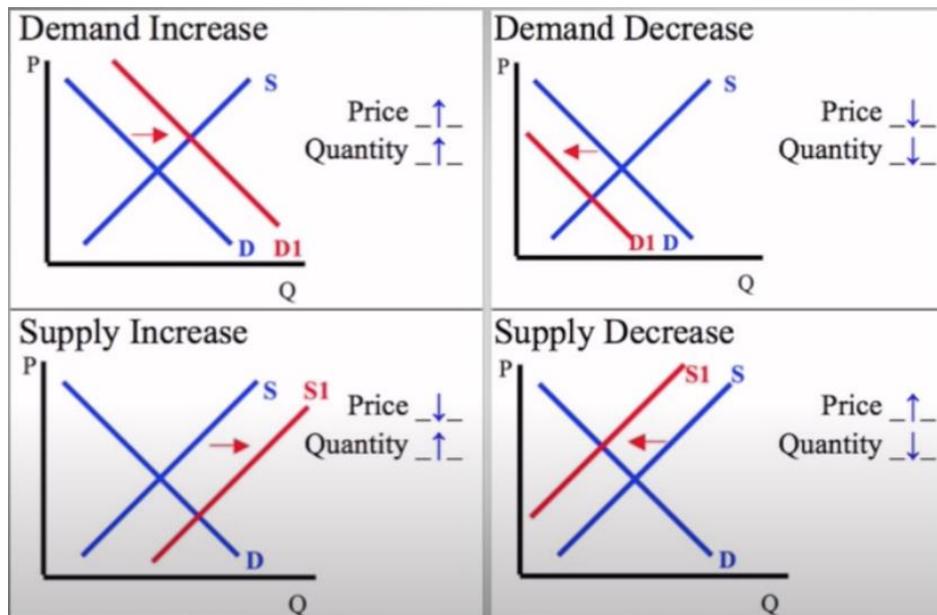
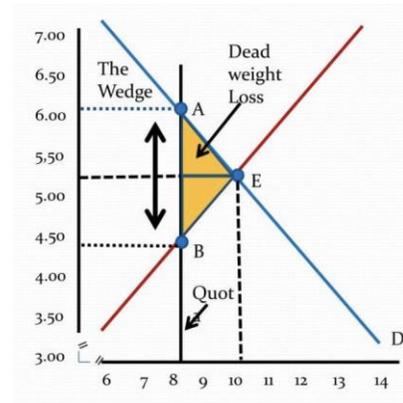


Image source: <https://www.youtube.com/watch?v=XLCCgk06SBA&list=PLoGgviqq4847-M3z5bOgGoX1fWVshEsLL&index=12>

## 2.8 The Effects of Government Intervention in Markets

### Quantity Controls:

- **Quota:** quantity control saying only  $x$  amount can be bought or sold
- **License:** gives owner right to supply good/service
- **Demand price:** price at which given quantity is demanded
- **Supply price:** price at which given quantity is supplied
- Transactions
  - Transactions of good/service
  - image source: <https://t.me/apresources>
  - Transaction of license
- **Wedge:** quota drives wedge between demand price and quantity transacted
  - Vertical distance between A and B



## 2.9 International Trade and Public Policy

- If the world price of a good is lower than the domestic price, the country will import the good.
- If the world price of a good is higher than the domestic price, the country will export the good.
- **Protectionism:** the government's use of embargoes, tariffs, quotas, and other restrictions to protect domestic producers from foreign competition.
- **Embargoes:** A law that hurts trade with other countries.
- **Tariffs:** A tax on an import.
  - Economic Effects of tariffs:
    - Consumers pay higher prices and consume less
    - Consumer surplus has been lost
    - Domestic producers increase output
    - Declining imports
    - Tariff Revenue
    - Inefficiency
- **Quotas:** A limit on the quantity of a good that may be imported in a given time period.
- Tariffs & Quotas have similar economic effects
  - Both hurt consumers with artificially high prices and lower consumer surplus

- Both protect inefficient domestic producers at the expense of efficient foreign firms, creating DWL
- Both reallocate economic resources toward inefficient producers
- Difference: tariffs collect revenue for the government, while quotas do not

